The distributive impact of new welfare policies in the context of old welfare institution: A multilevel analysis of income inequality across OECD countries

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Abstract

This thesis provides a quantitative investigation into the effect of new social policy instruments on income inequality. Income inequality has increased over recent decades in the developed world, and existing studies have shown that a high level of income inequality is related to many social problems such as low levels of social trust or high crime rates. The welfare state, which had played an important role in relieving poverty and income inequality, is now under pressure for reformation due to economic and sociological changes.

Many new policy instruments have been introduced in the process of welfare reform, and this thesis focuses particularly on private pensions and an active labour market policy. Existing studies have examined the distributive outcome of these policy instruments but they have shown inconsistent results. In addition, the existing literature suffers from limitations, particularly in the failure to consider the interaction between new policy instruments and the pre-existing institutional design of the welfare state. The contribution of this study is to examine how new policy instruments affect income inequality by considering the interaction between new policy instruments and the institutional design of the traditional welfare state.

Data are measured at country-level and consist of nineteen OECD countries between 1980 and 2010 (for the case of private pension), and twenty-one OECD countries between 1985 and 2010 (for the case of active labour market policy). The analysis is conducted mainly by multi-level analysis. Multi-level analysis can estimate the effect of time-invariant variables without unrealistic assumptions. The results suggest that an increase in private pensions (excluding mandatory private pension) is related to a decrease in income inequality among the elderly but that the impact is different according to the institutional design of the public pension system. An increase in private pensions is related to an increase in income inequality when the public pension has a low level of coverage and a high level of earnings-relatedness. In the case of an active labour market policy, the results suggest that an increase in spending on active labour market policy is related to a decrease in income inequality, but this relation goes in the opposite direction when the unemployment benefit is based on a targeted or flat-rate system. This thesis suggests that there is no trade-off between new policy instruments and the traditional welfare state if the traditional welfare state is well-designed.

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Acknowledgement

"God will make a way, where there seems to be no way. He works in ways we cannot see but he will make a way for me"

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Author's declaration

I, Ikhyun Jang, declare that this thesis is a presentation of original work and I am the sole author. This work has not previously been presented for an award at this, or any other, University. All sources are acknowledged as References.

Chapter 1. Introduction to the thesis: the rationale for the study, research questions and methodology

Income inequality has increased over the last few decades, not only in developing countries but also in the developed world (OECD 2008; 2013). Income inequality is an inevitable consequence of the nature of a free market system which respects individuals' capacities and responsibilities. Many studies, however, have shown that extreme income inequality is closely associated with various social problems. Severe income inequality is correlated with a reduction in well-being and an increase in the sense of relative deprivation for poor people (Alesina *et al.*, 2002; 2004). In addition, the poor are likely to suffer from poor health, such as obesity or diabetes, in a more unequal society. Income inequality has harmful effects on society as well as on individuals (Wilkinson & Pickett, 2007). Many studies have shown that the rate of serious crime (murder, rape and similar crimes) tends to be higher in an unequal society and the birth rate among teenagers is also higher in an unequal society (Hsieh & Pugh 1993; Blau & Blau 1982; Rogers 1979; Kaplan *et al.*, 1996; Wilkinson & Pickett, 2007; 2009).

As a result, a society becomes more unstable if inequality is very high. Income inequality is a bad influence on society not only from the perspective of fairness but also from the perspective of the economy. Serious income inequality lowers social mobility, which is an incentive to work harder, so the dynamic power of the economy is reduced (OECD, 2015). The bad influence of income inequality on society results in a reduction in the degree of trust in the society, which is considered an important factor in social capital (Putnam, 1995; 2000; Paskov & Dewilde, 2012; Alesina & Glaeser, 2004). Social capital is useful for reducing the transaction cost in society so it stimulates economic development as well. Severe income inequality results in less dynamic power and less social capital so it is harmful to economic growth.

Income inequality is the consequence of complicated interactions between a variety of economic, political and sociological factors. Previous studies of income inequality have focused on economic factors, such as the economic growth rate, GDP *per capita* or the structure of the labour market (Kuznets, 1955). These studies have argued that income inequality increases in the early stages of economic development but that it gets better when the economic structure matures. On the other hand, some studies have focused on political factors affecting income inequality. These studies have insisted that income

inequality is generated in a market economy system but that political factors can change the control of the market system itself (Hacker & Pierson, 2010; Stiglitz, 2012). Democratic institutions, the partisanship of a government or the degree of corruption are often referred to as the main reasons for income inequality (Hicks & Misra, 1993; Birchfield & Crepez 1998; Kittle & Obinger, 2003; Chong & Gradstein, 2007).

A welfare state is designed to protect people from risk and help them to maintain a decent level of quality of life regardless of individuals' economic capability. A welfare state has various goals but it is closely related to income distribution. As already observed, income inequality is likely to be determined by economic and political factors, but the welfare state and social policy reshape income distribution so there are limits on the restraining factors on income inequality. It is still very important, however, to control the increase of income inequality as income inequality is maintained at relatively low levels in countries which have a relevant welfare system.

The foundation of the industrial welfare state system was established and developed after the Second World War (Bonoli, 2013; Kersbergen & Vis, 2014). The welfare state in developed world was expanded in the 1950s and 1960s when an old age pension system, unemployment benefits and a public health system were established. The traditional welfare state is still playing an important role but has gone through substantial changes over the last few decades (Bonoli & Natali, 2013). Low fertility rates and the increase in life expectancy increase public spending on pensions, on care of the elderly and on health care. At the same time, changes in the labour market structure have brought about long-term unemployment due to a lack of appropriate skills and knowledge. These changes lead to an increase in social spending which in turn increases the fiscal burden of governments

Under these circumstances, a welfare state attempts to reform an existing welfare system. In some cases 'reform' is synonymous with 'cutback', but reform is also closely related to the development of new functions of a welfare state, which include policies designed to move unemployed people into employment, facilitating the conciliation of work and family life, the privatisation of the pension system and investment in human capital (Bonoli, 2013). Some studies have argued that this is a transition from a 'social welfare state' to a 'social investment state' which puts more emphasis on investment and education, rather than on protection (Jenson, 2012; Bonoli, 2013).

There are many studies which have examined the relationship between the traditional welfare state and income inequality. There are, however, few empirical studies which have examined the distributive outcome of new policy instruments in a welfare state. Some studies have looked at the relationship between an increase in the share of private pensions and income inequality; some of them have found that income inequality among the elderly increases when the proportion of private pension systems increases (Wells, 2004; Hughes & Stewart, 2004; Fukawa, 2006). Other studies have found that income inequality among the elderly decreases when the proportion of private pensions increases (Vliet, 2012). To examine the effect of active labour market policies (ALMPs hereafter), most studies have focused on the relationship between income distribution and social investment which cover ALMPs and most of them have found a significant effect between the two (Vaalavuo, 2013; Card *et al.*, 2010; Cantillon, 2011). Vliet & Wang (2015) examined the effect of ALMPs on the poverty rate but they did not find any significant relationship between them.

Previous studies have not explicitly considered the interaction between new policy instruments and a pre-existing welfare state institution. New policy instruments do not perform in a vacuum as traditional welfare state institutions already exist. Some researchers have argued that increases in private pensions are closely related to the institutional design of the public pension system. For example, Palme (2006) argued that a strong earnings-related pension makes a private pension less attractive so the impact of private pensions on income distribution is limited. For ALMPs, some studies have suggested that generous unemployment benefits reduce the effect of ALMPs in terms of the growth of the employment rate (Carrasco, 1999; Congregado & Millan, 2013). This thesis therefore offers an attempt to analyse the relationship between income inequality and the reform of the welfare state taking into consideration the interaction between new policy instruments and the traditional welfare state.

To achieve this, a multi-level analysis will be employed. Time-series, cross-sectional data is useful in comparative social policy analysis, but there are a number of issues that have to be considered. The fixed-effect model and the random-effect model are frequently used methods: the fixed-effect model is the most useful because it controls unobserved heterogeneity between countries, but it does not test time-invariant variables, such as institutions, as it treats these variables as fixed effects. The random-effect model is based

on unrealistic assumptions so it is likely to produce spurious results. A multi-level model, however, separates the within-country effect from the between-countries effect, so we can control unobserved country heterogeneity and estimate the effect of time-invariant variables as well. We can see how new policy instruments interact with existing institutions through the multi-level model.

The objective of the thesis

The objective of this thesis is to offer an empirical analysis of the relationship between new policy instruments introduced as a welfare reform programme and changes in income inequality. In particular, the focus of this thesis is on the role of private pensions, which have increased instead of the public pension system, and the role of ALMPs which are considered to be the cornerstone of social investment (Bonoli, 2013) and arguably replace the passive labour market programme

First, this thesis examines the distributive outcome of private pensions and ALMPs as new policy instruments of the welfare state. This is about how those new policy instruments directly affect income inequality among the elderly population and the working-age population respectively.

Second, this thesis examines how much the effect of new policy instruments on income inequality can be changed by the institutional design of the traditional welfare state. As stated above, the role of the traditional welfare system is still very important. Previous studies have shown that there is a close relationship between private pensions and the public pension system, and it is same for the relationship between ALMPs and unemployment benefits and other forms of social assistance for the unemployed. In other words, the effect of private pensions on income inequality much depends on the institutional design of the public pension system. Equally, we can assume that the effect of ALMPs also depends on the institutional design of an unemployment benefit system.

Discussion about the institutional design of the traditional welfare system is related to the debate on universalism and targetism (Korpi & Palme, 2003; Van Kersbergen & Vis, 2014). There is a long history of debate on the distributive outcome of universalism and targetism. An intuitively targeting system looks more useful in terms of reducing poverty and inequality but empirical studies have shown that countries based on a universal system have lower levels of poverty and income inequality (Korpi & Palme, 2003; Scruggs

& Allan, 2006). It is expected that the effect of private pensions or ALMPs on income inequality can also be different when they are used in the different context of the public welfare system. In this current study, I shall explore what consequences we are likely to get when new policy instruments are combined with either a universal-based system or a targeting-based system

The main research questions can be summarized as follows.

1) Does the institutional design of a welfare state affect income inequality?

2) What are the effects of new policy instruments, specifically private pensions and ALMPs, on the income inequality of the elderly and the working-age populations respectively?

3) To what extent can the effect of new policy instruments be changed by the institutional design of traditional welfare programmes? In other words, do pre-existing universalist and targeted policy structures make a significant difference to the effect of new policy instruments?

There are some studies which have considered the distributive outcome of private pensions and ALMPs, as well as the distributive outcome of the institutional design of the welfare state. Thus, research questions (1) and (2) can be regarded as a replication of previous research studies. Question (3) is the more innovative part of this thesis, as previous studies have not explicitly considered the interaction between the institutional design of a welfare programme and new policy instruments.

The research questions of this thesis are designed to contribute to knowledge on how income inequality can be effectively constrained through welfare programmes in a period of transformation of the welfare state. A new policy programme can have either a negative or a positive effect on income inequality depending on the pre-existing traditional welfare system which surrounds them. The main analysis of this thesis deals with the effect of private pensions and their interaction with the institutional design of the public pension system, and other parts deal with the effect of ALMPs and their interaction with the unemployment benefits and minimum income programmes which support the unemployed.

Research method and design

Usually comparative research at country level using a quantitative method suffers from the small-N problem. The number of countries is limited and countries are not randomly selected (Beck & Katz, 1995; 1996). Therefore, time-series cross-sectional (TSCS hereafter) data are frequently used to overcome the small-N issue. Repeated observations in each country over time can increase the sample size. Even so, there are still some issues to be solved, such as auto-correlation or country heterogeneity. Ordinary least square regression cannot be used for TSCS data as observations are likely to be correlated with each other and the result is likely to be unreliable (Stock & Watson, 2003; Woodridge, 2015).

The fixed-effect model is one method that can be used with TSCS data. The advantage of the fixed-effect model is that country heterogeneity can be controlled by treating country-specific characteristics as fixed effects so that we can see a pure relationship between dependent and independent variables stripped of any country-specific effect. In this case, however, it is impossible to estimate the effect of time-invariant variables or slowly changing variables as the fixed-effect model treats them as fixed effects so they are already controlled. In this thesis, I shall seek to estimate the institutional design of a welfare programme so it is not possible to use the fixed-effect model. The random-effect model can be used as an alternative, although its results can be unreliable because, as already stated, the random-effect model is based on unrealistic assumptions (Bartel, 2008; Beck, 2001; Wilson & Butler 2007).

In this thesis, I shall therefore use multi-level modelling as a method of analysis. As already explained, multi-level modelling can separate the within-country effect from the between-country effect and allow the use of contextual variables which do not change over time but are different in different countries. By using this method, it is possible to estimate the effect of the institutional design of the traditional welfare programme and its interaction with new policy instruments. Some sensitivity tests will also be carried out. As noted above, important factors in the institutional design of any welfare programme are universalism and targetism, so the classification of institutions is based on universalism and targetism.

This thesis covers nineteen developed countries in the case of private pension and twenty-one countries in the case of ALMPs and a time period from the 1980s to 2010.

Data are collected from the *OECD Social expenditure data base* (SOCX) (2015), the *OECD pension at glance* from 2003 to 2013 (2003; 2005; 2007; 2009; 2011; 2013), Scruggs *et al.*'s *Comparative welfare entitlements data base* (2013), Brady *et al.*'s *Comparative welfare state data* (2014) and various country-specific sources.

Structure of thesis

This thesis is structured in four main parts comprising an introduction, a literature review, methodology, and analysis and discussion. It has four literature review chapters, a methodology chapter, empirical chapters and a concluding chapter which includes a discussion of the findings and the results.

In Chapter 2, I shall review the relevant literature on how income inequality affects our society. The aim of this chapter is to provide a justification for why we need to care about income inequality. This chapter begins with an overview of the effect of income inequality. I shall show how it affects individual level variables such as the health status of the poor and the subjective well-being of individuals, and issues at the societal level, such as crime rates, suicide rates and the decrease in social trust.

In Chapter 3, I shall explore previous studies of the driving factors on the increase in income inequality. Conventional analyses of the economic factors affecting income inequality will be reviewed and then a discussion of the political factors regarding income inequality will follow. In this chapter, I shall establish the foundation for which control variables should be selected for this thesis.

In Chapters 4 and 5, I shall concentrate on the role of the welfare state to constrain increases in income inequality. In Chapter 4, I shall primarily focus on a discussion of the traditional welfare state, such as how it starts and how it has developed along different paths in different countries. I shall also explain the logic for classifying different welfare regimes and empirical studies of the distributive outcome of welfare regimes. As noted above, the main discussion is based on the difference between universal and targeted systems. This chapter also covers issues of how to measure the welfare effort of a government. This is the so-called 'dependent variable issue' and it provides a discussion on what indicators can be selected to reflect welfare effort more thoroughly. In Chapter 5, I shall discuss welfare typology. I shall describe how welfare states have taken different

paths in order to shape their own welfare provision and I shall discuss the distributive outcomes of different regimes.

Chapter 6 introduces contextual changes surrounding welfare states and the new function of a welfare state. I shall explain the ageing population, the reform of public pension programmes and the role of private pension schemes. In addition, I shall explain the background to and the aims of ALMPs. I shall then discuss previous empirical research studies in order to examine the distributive outcome of private pensions and ALMPs and their shortcomings. I shall show that previous studies have not employed inferential methods but have just compared figures between countries, and that some studies failed to control heterogeneity among countries, which will provide the reason why this should be re-examined using a different statistical method.

Chapters 7, 8, 9, and 10 are the core of this thesis. In Chapter 7, I shall focus on the data, the methods and the research framework used throughout the thesis. First, I shall present the framework of the analysis, briefly outlining the size of the sample and a list of the countries used in this thesis, and I shall describe details of the data, the variables and the method for measuring the variables. I shall also discuss the advantages and disadvantages of the fixed-effect model and the random-effect model, offering a justification of why multi-level modelling is used in this thesis and explaining how multi-level modelling works using a TSCS data set.

As stated above, in Chapters 8 and 9 I shall principally deal with the effect of private pensions. In Chapter 8, I shall introduce details of the variables used in the analysis of private pensions and provide a detailed explanation of how to classify public pension systems. Specific hypotheses will be proposed and descriptive statistics will be given. The descriptive statistics will be shown in simple formats, such as tables and graphs. I shall also show the result of the fixed-effect model, the random-effect model and the multi-level model so that we can see the distributive outcome of private pensions and how it changes depending on the different public pension systems. Chapter 9 is a complementary chapter to Chapter 8. Because in Chapter 8 I shall not explicitly consider a two-tier system of public pension, in Chapter 9 I shall look at the distributive effect of a standard pension programme and a minimum (or basic) pension programme and how they change when the proportion of private pensions increases.

In Chapter 10, I shall deal with the effect of ALMPs. I shall offer a detailed explanation of the variables used in the analysis of ALMPs and introduce criteria for how to classify unemployment benefits and minimum income programmes. I shall also give descriptive statistics first and then show the effect of ALMPs on income inequality, and how it changes when it is combined with different unemployment benefit systems and minimum income programmes.

Finally, In Chapter 11, I shall discuss all the findings and propose the conclusion of this thesis. I shall review the empirical analysis, discuss the limitations of the thesis in terms of theory and methodology, and synthesise all the results from the three empirical chapters. I shall explain the policy implications and suggest how we might constrain income inequality through new policy instruments, and how we can set the relationship between new policy instruments and the traditional welfare state. I shall also identify potential directions for further research into income inequality and the role of the welfare state.

Chapter 2. Literature review: the effect of income inequality

2.1. Introduction

In 1975, Arthur Okun wrote a seminal book entitled *Equality and efficiency: the big trade-off*. The core message of this book can be summarized as that inequality is the price which the US pays for its economic achievement (Rauch, 2012). To put it another way, it means that income inequality is inevitable in the process of establishing a brisk market economy system. In another key study, Kuznets (1955) argued that income inequality increases in the early stage of economic development, but that eventually it will decrease as an economic structure matures (Atkinson, 1997). It has been argued that poverty is a particularly critical factor which leads to social dysfunction, so government intervention has also focused more on reducing poverty. In contrast, income inequality has been considered in the context of a relationship with economic growth, so the harmful impact on the individual and on society has been neglected. Titmuss (1965) suggested that politicians and the public have a tendency to regard poverty as a problem which should be removed but they are reluctant to accept inequality as a problem. As the policy action to reduce income inequality needs to be accompanied by redistribution, which means taking someone's profit and giving it to others, it is therefore a very sensitive political issue in which no politicians want to seriously engage.

Another view in the literature has focused on the quality of the data for research on income inequality. One of the reasons why income inequality has been neglected is that it has been very difficult to carry out research on this topic because of the lack of reliable data. The quality of data was very poor in the past so the outcomes from those studies were likely to be unreliable.

Atkinson and Brandolini (2009) pointed out some preconditions for the data sets which are required to improve the quality of research: (a) a reference unit should be established in order to decide whether to use the individual level or the household level; individual level variables should not be applied to household level research; (b) if we use the household level, then household income should be adjusted according to the household size; (c) when the Gini index is employed, equivalised income should be used; (d) there must be consistency in the definition of income and expenditure: regarding the concept

of resource utilised, the researcher should stick to one measurement either income or expenditure; and (e) tax must also be considered cautiously; the researcher should decide whether to use post-tax income or pre-tax income. Pre-tax income is used to analyse market income inequality, whereas post-tax income is used to analyse disposable income inequality. Researchers must therefore decide which income they are going to use according to the objective of the research. However, the quality of data has grown very quickly due to developments in statistics and computer science, so now we have a wide range of empirical studies on why we need to accept income inequality as a serious problem, as well as what factors drive income inequality.

Many studies have argued that income inequality must have a close association with social problems. For example, one of the earliest evidences for the tendency of the association between inequality and social problems was Rodgers's study (1979) which examined the relation between life expectancy / infant mortality and income inequality across 56 poor and rich countries. The findings suggested that income inequality is consistently significant for health status, which means that high income inequality is associated with lower life expectancy and higher infant mortality rates. In addition, Kaplan *et al*. (1996) showed that societies with high income inequality are more likely to have a low birth rate, high homicide rates and violent crime. They compared fifty US states from 1980 to 1990 and estimated the correlation coefficients, and showed that income inequality was associated with a large number of health outcomes including mortality and death rate. They also showed that economic policy, which increases income inequality, has a negative impact on public health.

Recently, many studies have examined the impact of income inequality on social problems. Wilkinson and Pickett (2009) insisted that equality makes a society stronger and this triggered a heated controversy. Their study was based on their previous research into income inequality and social problems; they reviewed many previous studies across the OECD countries and the states in America and argued that income inequality is closely related to various social problems such as crime rates and suicide rates, so income inequality induces dysfunction in a society. They showed that the correlation between income inequality and social problems is significant, so we need to do something to relieve the wide gap between the rich and the poor.

The objective of this chapter is therefore to review previous studies into the disadvantages of income inequality and to organize the empirical findings, and this will then provide us with an appropriate rationale for why we need to pay more attention to income inequality than before.

In this chapter, therefore, I shall review previous studies from classic historical works to the most recent ones. In the next section, the current trend and situation of income inequality will be set out so that we can see that the increase in income inequality is a global phenomenon. Then the disadvantages of income inequality will be discussed by reviewing previous studies. This section begins with a conventional discussion about the relationship between income inequality and economic growth and we can then see how the discussion expands to cover the impact of inequality at both the individual level and the societal level. The following part therefore is a discussion about the impact of income inequality on individual well-being, and then on social dysfunction. In the final section, research into income inequality in the context of welfare states will be reviewed.

2.2. The current situation of income inequality: where we are

Over the last few centuries, capitalism has been ingrained almost everywhere in the world. Muller (2013) summarised the features of capitalism as follows. Capitalism, which emphasized private property, stimulated the development of a market mechanism by the commodification of goods and services. This commodification forced people to use their time more efficiently so that they could use their own specialized skills to produce products. This division of labour led to massive production systems which made household items very cheap. Under capitalism, humankind experienced unprecedented progress not only in the economic aspect but also in the cultural aspect. Muller consequently stated, "The history of capitalism is also the history of extension of communication, information, and entertainment" (Muller, 2013: 36-37).

The progress of capitalism, however, brought about inequality. This was inevitable since a market system is based on the principle of different rewards for different performance. There are diverse kinds of inequality in income, opportunity, between countries, between ethnic groups and so on. Other social problems such as social stratification and social distance are also related to the issue of inequality. This section shows where we are today after experiencing the unprecedented progress of capitalism.

2.2.1. Income inequality in the developed world

Most of the countries in the developed world have experienced increasing income inequality over the last two decades. Published data show that income inequality decreased in the 1950s and 1960s, but then began to increase in the mid-1970s and the 1980s. The labour market changed profoundly because of developments in technology, globalisation and regulatory reforms and this affected changes in earnings and income (OECD, 2015)

The disposable income of households has increased by 1.7% per year on average in OECD countries over last two decades, but the income of the top 10% of households increased faster than those in the bottom 10%, so income inequality is getting bigger. In the 1980s, the richest 10% of the population had seven times more income than the poorest 10%, and this increased to eight times in the 1990s and to almost ten times (9.6 times) in the 2000s (OECD, 2015). The Gini coefficient,[1] which is the most frequently used measurement of income inequality, indicates 0 if we have perfect equality and increases to 1 as inequality grows: it was 0.29 on average across OECD countries in the mid-1980s but increased to 0.32 in 2013 (OECD Income Distribution Database, 2015).

Although the speed of the increase in income inequality is slightly different in different countries (Barro, 2000; Caminada & Goudswaard, 2001), we can nevertheless see that income inequality has been increasing on average across the OECD countries for the last few decades. Table 2.1 summarizes the changes in the Gini coefficient across OECD countries from the mid-1980s to 2012 (2013 for Finland, Hungary, the US and the Netherlands). Greece is the only country which showed a decrease in income inequality during that period, and the size of the increase was relatively high in Sweden, New Zealand and the US. Belgium, the Netherlands and France showed a relatively low increase but it nevertheless increased from 0.282 to 0.314 on average. Figure 2.1 then shows the trend in income inequality in selected OECD countries and clearly demonstrates that income inequality continued to increase in most countries.

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[1] Detailed information on the Gini coefficient will be provided in Chapter 7.

Table 2-1 Change of Gini coefficient between mid-1980 to most recent year

	1985	2012	change
Denmark	0.221	0.251	0.030
Czech Republic	0.232	0.251	0.019
Norway	0.222	0.253	0.031
Finland	0.209	0.262	0.053
Sweden	0.198	0.274	0.076
Hungary	0.273	0.288	0.016
Germany	0.251	0.291	0.041
Luxembourg	0.247	0.299	0.052
Canada	0.293	0.316	0.023
Australia	0.309	0.324	0.015
Italy	0.291	0.325	0.034
New Zealand	0.271	0.333	0.062
Japan	0.304	0.336	0.032
United Kingdom	0.309	0.344	0.035
Israel	0.326	0.377	0.051
United States	0.340	0.401	0.062
Mexico	0.452	0.482	0.030
Belgium	0.257	0.264	0.007
Netherlands	0.272	0.278	0.006
France	0.300	0.306	0.006
Greece	0.352	0.338	-0.014
Average	0.282	0.314	0.032

<Source: OECD Income Distribution Database (www.oecd.org/social/income-distribution-database.htm)>

Figure 2-1 Trend of income inequality from selected OECD countries

Trend of Gini coefficient from selected OECD countries
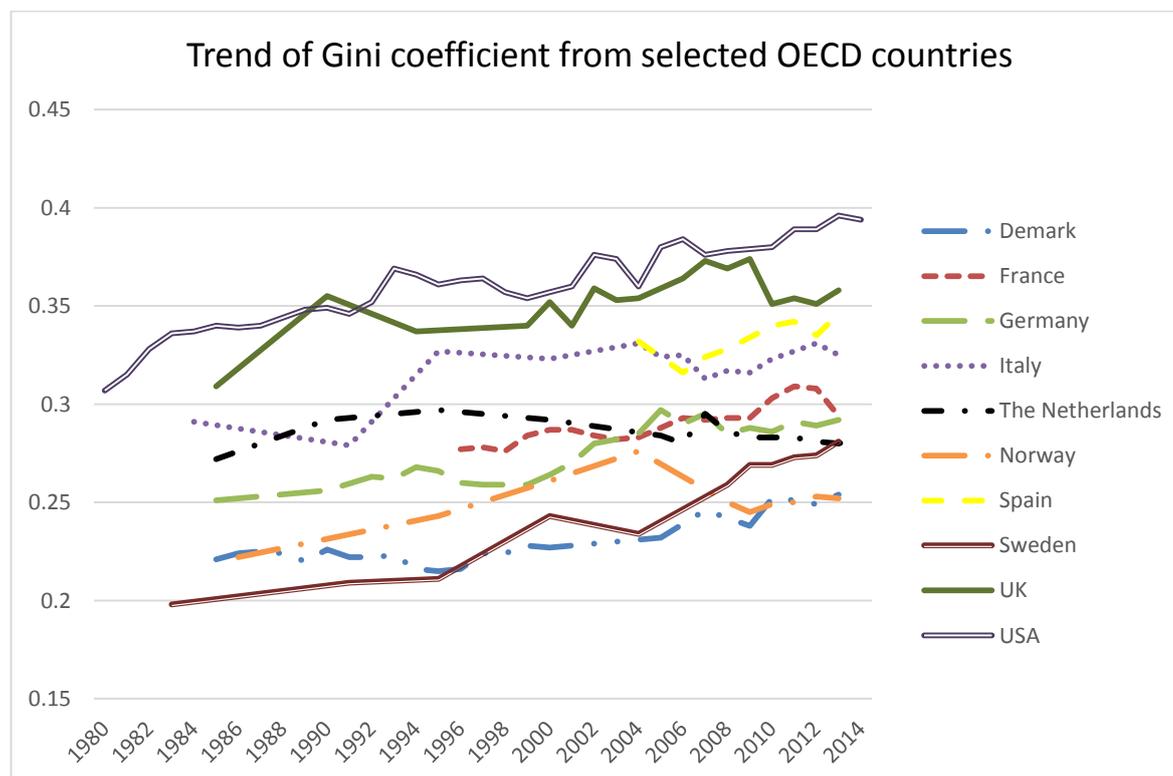
In particular, income inequality has increased more seriously since the economic crisis in 2008. The income of the poorest 10% in Spain dropped by 13% per year but only by 1.5% for the richest 10% (OECD, 2015). Income at the top level even increased in real terms in some countries such as Austria, Denmark, France and the US. Generally speaking, the income of the poorest 10% increased less than the income of the top 10% when the economy was growing, but the income of the poorest dropped more when the economy went into crisis. In other words, the economic crisis hit the lower end of income distribution harder. Consequently, we can see that income inequality increased in bad economic times as well as in good economic times.

In brief, most countries experienced market income falls because of the financial crisis, and this led to an economic recession in most countries, falling growth rates and increasing poverty. This created problems for everyone, but the pain was not evenly shared among households. The poor lost more and the rich lost less, and this widened the gap between the top 10% and the bottom 10%.

Investigation of the trend in income inequality across the developed world shows that it decreased during the 1960s and 1970s but that it started to increase again in the 1980s and was accentuated after the economic crisis in 2008. In other words, we can see the increase in income inequality over the last two decades across the world so now we have to pay attention to what kinds of problem can possibly be caused by this increase in income inequality. In the next section, the negative impact of income inequality on our society will be discussed. The discussion can be divided into two parts; in Section 3 I shall discuss the conventional debate on the relationship between income inequality and economic growth. This relationship has been the main issue for economists for many years. In the following section, I shall therefore review theoretical and empirical studies of this relationship. They show mixed results, but it seems that recent researches have shown that income inequality has a damaging impact on economic growth. In Section 4, I shall discuss the relationship between income inequality and various social problems. Studies have shown that the increase in income inequality is related to increases in a variety of social problems, such as decreasing the subjective well-being of individuals, causing bad health status or increasing the crime rate.

2.3. A conventional discussion on relation between income inequality and economic growth

As already noted, the relationship between income inequality and economic growth has been an important issue for economists. This section begins by considering the traditional research of Kuznets (1955) and reviews other studies in order to re-examine his argument. According to his argument, an increase in income inequality is inevitable during the process of economic growth but many studies have shown that economic growth is not necessarily accompanied by an increase in income inequality.

2.3.1. Discussion on Kuznets's 'Inverted-U hypothesis'

Since Kuznets proposed the 'inverted-U hypothesis' in 1955 (Kuznets, 1955), the relation between income inequality and economic growth has been one of the main topics considered by social scientists. Kuznets argued that income inequality is determined by the level of economic development. Kuznets's main idea was that income inequality is mainly caused by the difference in productivity between agriculture and urban activity. In the early stage of a country's development, there is a huge migration from rural areas to urban areas. Because the productivity of urban economic activities grows faster than that of agricultural activities, the income gap between rural and urban areas leads to inevitable income inequality. Income inequality is expected to decrease when the income *per capita* reaches a specific level since the process of industrialisation creates the so-called trickle-down effect, which benefits all people in the economy, and eventually the incomes of individuals in rural areas are increased. In brief, income inequality increases in the early stage of economic development but is relieved eventually as the economic structure matures without any policy effort from the government. From this point of view, income inequality is not considered a serious issue because it will be relieved naturally so no intervention for redistribution is necessary.

The inverted-U hypothesis is, however, quite a controversial issue. Some studies have provided convincing supportive evidence for it. For example, Adelman and Morris (1973) examined the relationship between the income share of the poorest 60% and economic development using political and economic data from 74 countries, including both developed and developing countries, and showed supporting evidence for Kuznets's hypothesis. There are no long-term data for the developing world, so they compared the

average of the key characteristics of countries at different levels of economic development. They found that income inequality tended to be low in highly developed countries whereas it was relatively high in developing countries. On the other hand, however, many studies have disagreed with this hypothesis. Saith (1983) emphasized inter-country differences regarding size, historical heritage, and the fact that not every country experiences the same process of industrialisation.

In addition, Atkinson (2009) argued that the early studies of income inequality were based on poor data sets because of the lack of statistical technology. In other words, there were only sparse available data on income inequality for cross-country analysis until 1950 when the UN began to establish cross-country data sets on income distribution, and other international agencies began to add further statistics in 1970 and 1980 (Atkinson & Brandolini, 2009). Atkinson (2009) also pointed out the lack of available data in Kuznets's research. Kuznets's inverted-U hypothesis was based on only five observations from the US and the UK, and two observations from Prussia, Saxony, and from the united Germany respectively. Kuznets also recognized the weakness of the available information, commenting that his paper was "5 per cent empirical information and 95 percent speculation" (1955: 26).

We can consider two questions regarding Kuznets's hypothesis. The first is whether income inequality is inevitable for economic growth, and the second is whether income inequality would be relieved without any policy intervention for redistribution. The second question is a debate not only on the relationship between economic growth and income inequality, but also on the effect of a redistribution policy, and this will be discussed further in Chapter 3. In the following section, I shall review studies which have examined the relationship between economic growth and income inequality in order to check whether an increase in income inequality promotes economic growth or not.

2.3.2. An assessment of relationship between income inequality and economic growth

Many studies have in fact shown that the relationship between economic growth and income inequality works in both directions (Galo & Sagales 2011; OECD 2015). The gap between the rich and the poor can act as an incentive for the poor to work harder, study harder or take more risks. In this case, inequality can bring economic growth. However, it

is the rich who can take greater advantage of economic opportunities when income inequality is very high. A rich family is able to educate its children to a higher level than a poor family, so children in poor families are unlikely to have access to better opportunities. Consequently, economic growth can be slower when income inequality is very high, as only a small proportion of people in a society can have opportunities to invest in and develop themselves.

Some researchers have offered theoretical explanations for the positive relationship between income inequality and economic growth. Colman (1988) attempted to explain why income inequality is not only inevitable but also essential in the early stage of economic development. Their argument was based on the assumption that the rich have a higher propensity to save their income. This saving is very important for increasing the productive capacity which stimulates economic development. In other words, accumulation of capital is salient in economic development and the accumulation of capital depends on savings, so it is important for the rich, who have a higher propensity to save, to have higher incomes. In this sense, income inequality is necessary for accelerating economic development (Colman, 1988).

Other researchers have also argued that income inequality is positively related to economic growth. Saint-Paul and Verdier (1993), for example, argued that the median voter is likely to support a high rate of taxation to fund a public education system, which increases human capital and leads to economic growth. Galor and Tsiddon (1997) argued that income inequality generates a higher rate of technological progress and growth by enhancing high-ability workers to concentrate on technologically advanced sectors. Thus, they argued that income inequality and economic growth are positively related.

There have also been empirical studies which have shown that income inequality is positively related to economic growth. Fobes (2000) argued that those studies which show a negative relationship between economic growth and income inequality are based on the cross-sectional regression model, which is likely to suffer from omitted variable bias. Fobes re-examined the relationship between economic growth and income inequality using panel data from forty-five countries from 1965 to 1995 and found that economic growth was positively related to income inequality. Other studies focusing on within-country variations through panel data have shown an insignificant or a positive relationship (Li & Zou 1998; Andrew *et al.*, 2011). Galo and Sagales (2011) reviewed

various studies on this topic and found that cross-country regressions examining long-term relationships mostly showed a negative relationship between inequality and economic growth, whereas panel data estimates in the short and medium term showed mixed evidence.

Many studies have shown that income inequality might not be positively related to economic growth. Leightner (1992) showed that increases in savings do not necessarily lead to increased investment by using the cases of Korea and Japan as examples. According to his findings, it is not an increase in savings but an increase in consumption that causes investment (Leightner, 1992). Dyan and Skinner (2000) showed that the propensity to consume gets less at the high end of income distribution by using the data from a consumer expenditure survey in the US. Their regression analysis suggested that the rich save more than the poor, not only considering current income but also considering permanent income (Dyan & Skinner, 2000). These studies showed that more equality could be useful for economic development, although this certainly requires more research. At least, what they proposed shows that income inequality is not an essential element for promoting economic growth (Gallo, 2002).

Furthermore, some empirical studies have suggested that inequality has a harmful effect on economic growth. Deininger and Squire (1997) showed that inequality in initial assets (measured by the inequality of land distribution) rather than income is a more serious problem for economic development. They proposed a theoretical explanation for this empirical finding. They suggested that inequality impedes economic growth in two ways. The first way is through the political process. According to their argument, inequality in assets has a harmful effect on subsequent economic growth because the poor vote for a stronger redistribution policy as income inequality becomes more serious, so a potential government which seeks to increase redistribution is likely to take power, and a more active redistribution policy can reduce the incentive for more investment. The second way is through the financial process. In an unequal society, fewer individuals can access the credit market and this leads to lower investment. This lower investment brings about a lower stock of human and physical capital and eventually leads to lower growth. When income inequality is bigger, the spending power of the poor tends to decrease. However, politicians and the public usually do not like to admit this, so they try to compensate by allowing the poor greater access to credit, such as an easy home mortgage. As more

people get credit, the economy becomes more vulnerable to economic shocks. When a financial crisis hits, an economy based on credit is more likely to collapse (Raja, 2010). This shows how income inequality can exacerbate a financial crisis.

Some empirical studies have argued that income inequality could disturb the positive impact of economic growth. Gottschalk and Danziger (1985) deconstructed the causes of poverty to find the determinants of poverty. They found that both economic growth and social transfer are useful for reducing poverty using US household data from 1967 to 1982, but they assumed that the variance of income distribution is constant. They found that income inequality increased during that period and that this increase was related to an increase in poverty of 3.3%. They therefore argued that the anti-poverty effect of economic growth is cancelled by inequality. Smolensky *et al*. (1994) showed that economic growth has the effect of reducing poverty, but that inequality, in fact, cancels out the effect of economic growth on poverty reduction in the US. They estimated the poverty rate from 1963 to 1991 based on the assumption of a constant-variance, log-normal income distribution and found that the estimation and the actual poverty rate were similar until the late 1960s but that the actual poverty rate was higher than the estimation during the 1970s and 1980s. They removed the assumption of constant variance and found a better fit. This means that economic growth has a trickledown effect for reducing the poverty rate, but that an increase in income inequality, in fact, slows progress against poverty. Alesina and Perotti (1994), Alesina and Rodrik (1991) and Persson and Tabellini (1995) all demonstrated that an increase in income inequality is negatively related to economic growth, which implies that income inequality is not necessary accompanied by economic growth.

Recent research of IMF (2014) shows lower net inequality is significantly correlated with faster and more durable growth. It shows inequality is negatively related to the growth rate of per capita GDP in medium-term and also shows an increase of inequality is positively related to the risk that growth spell would end. It means low inequality is related to longer duration of economic growth. In other words, high income inequality is related to the decrease of economic growth in medium-term and related to less sustainable economic growth. In addition, this study also finds no negative effect of redistribution policy on economic growth. Another research of IMF (2015) shows an increase of income share of top 20% is related to GDP growth declines over the medium

term, whereas an increase of income share of bottom 20% is related to higher GDP growth. Recent OECD research (2015) employs panel data and finds income inequality is negatively related to economic growth.

In summary, empirical studies have shown mixed results, but an increasing number of studies have shown that high income inequality is related to lower economic growth. Empirical results show that income inequality is not necessarily essential for economic growth, and even high income inequality has a bad impact on economic development. Income inequality is sometimes considered as a motivation or an incentive for people to work harder which leads to economic development but, as this review has shown, there is ample empirical evidence that income inequality can impede economic development through the political and financial process. This debate is still continuing, but scholars have now begun to realize that income inequality has more diverse aspects and so it should be considered in a broader context, not only from the economic aspect but also, since the mid-1970s, from the social and individual aspects as well. Inequality study has therefore expanded its area to encompass a variety of dimensions and we have found that income inequality has a more profound effect on our society than simply economic growth. The following section therefore presents a review of the impact of income inequality from the individual and societal aspects.

2.4. The relationship between income inequality and social problems.

The impact of income inequality is quite diverse. Previous studies have shown that an individual's emotional state, such as level of happiness, satisfaction and well-being, is considerable influenced by his/her absolute and relative income levels. In this section, I shall review previous studies of how an increase of income inequality is related to an increase in social problems. In Sections 2.4.1, 2.4.2 and 2.4.3, I shall focus on how income inequality affects an individual's life, and in Section 2.4.4 I shall consider how income inequality affects a whole society. In Section 2.4.5, I shall summarizes the findings and discuss the causality between income inequality and social problems.

2.4.1. Income inequality and subjective well-being level

The subjective well-being level is considered to be a reliable indicator for measuring an individual's level of well-being (Dolan & White 2007). I shall take an individual's well-being

to evaluate the quality of his/her life rather than a "revealed preference" or "stated preference" (Sumner, 1996). Normally, in an empirical study, subjective well-being is treated as cardinal or ordinal response data, and there are several factors associated with the level of subjective well-being, such as personal, economic, and social factors (Dolan *et al.*, 2007).

In fact, there seems to be a consensus that income does affect the subjective well-being level of individuals (Graham, Eggers & Sukhtankar, 2004; Marks & Flemming, 1999). What they have suggested is that the well-being level increases as income level increases, but that marginal increases tend to diminish well-being. In addition, the impact of income is reduced when personal factors are included (Ferrer-i-Carbonell & Frijtres, 2004). Even so, it is very interesting that the level of well-being of the individual is also inversely related to the income of others (Easterlin, 1995). In other words, an individual's well-being does not increase even though his/her income increases if other people's income in the same social group increases more than their own at the same time. This shows that 'relative' income is more important than 'absolute' income. Studies of Dutch panel data (Van de Stadt *et al.*, 1985) and Belgian data (Kapteyn *et al.*, 1978) have shown that satisfaction with one's income is at least partially relative, and the same was found in Germany and in the UK (Clark, 2003). The fact that relative income is more important than absolute income in determining well-being level means that income inequality has a bad impact on an individual's well-being level since there are more people whose income is less than the income of their reference group in an unequal society.

Few studies have explored the association between income inequality and well-being level although there are some studies which have convincingly shown a negative relation between income inequality and well-being level. Schwarze and Harpfer (2003) showed that the Gini index had a negative and significant coefficient for subjective well-being level in Germany. Alensina *et al* (2002, 2004) conducted comparative studies of the difference in the impact of income inequality on individuals' happiness between European countries and the US. They found that inequality had a negative impact on individual happiness in both Europe and the US but that the impact was stronger in European countries. This means that Europe is more averse to income inequality than the US, so in Europe the happiness level falls further when income inequality increases. The

researchers inferred that the difference between the US and Europe was due to the difference in perceived social mobility.

Social mobility can mitigate the impact of income inequality since an individual can be motivated to work harder in order to move up the income ladder when social mobility is high. Americans usually believe that they have the opportunity to move up so the current income inequality may have little influence on an individual's ability to move (Alensia *et al.*, 2002). That analysis was based on a massive poll in 1998 and confirmed this argument since most Americans say that they can endure income inequality as long as the income is the result of effort and everyone can achieve it based on merit (Ladd & Bowman, 1998). In addition, the interesting thing is that the rich are more affected by income inequality than the poor in the US. The happiness of the poor is not actually influenced by income inequality but that of the rich is. The most plausible explanation for this is that the rich face the possibility that their income level might fall because social mobility is very high in the US. People believe that income inequality has a bad impact on the well-being of the poor, but the findings of that study showed that the well-being level of the rich can be more affected by income inequality than that of the poor.

In brief, income inequality has a bad effect on individual happiness but this effect can be mitigated when social mobility is very high. Moreover, income inequality has a bad impact on the rich as well as the poor. This topic definitely requires more study, but the previous studies reviewed in this section have shown that income inequality has a bad impact on people's subjective well-being level, although the degree of that impact might be slightly different in different regions, income levels and political partisanship.

2.4.2. Income inequality, solidarity, and social capital

There have been many studies of the relation between income inequality and social cohesion or social trust, and this social cohesion, social trust or social capital is based on the individual's sense of solidarity. Solidarity can be defined as a 'willingness to contribute to the welfare of others' and it has been discussed for a long time in social theory. Durkheim (1893) insisted that solidarity is the one of essential elements for the sustainability of a social system, and solidarity is considered to be the foundation which binds a society together (Van Oorschot & Komter, 1998). It has been said the social capital and social cohesion are very important for the proper function of society. A decline in

social capital actually impedes civic engagement which is a useful tool for improving the outcome of representative democratic government (Putnam, 1995; 2000). Solidarity is therefore important since it provides an emotional foundation for social capital and there would be social problems if we have less solidarity (Wilkinson & Pickett, 2009).

It has been reported that social solidarity is also much influenced by income inequality within a society (Paskov & Dewilde, 2012). One study has shown that solidarity is restrained by the expansion of individualism and a market economy (Alesina & Glaeser, 2004) since the market economy triggers competition between individuals and people have less feeling of solidarity for each other. People are more willing to support other people's welfare when they believe that they are alike and share the same problems (Paskov & Dewilde, 2012). We can therefore argue that high income inequality could lead to a lack of solidarity since people do not believe that they share the same problems as the income gap gets larger, and this lack solidarity might bring about many social malfunctions.

Paskov and Dewilde (2012) examined the relationship between income inequality and social solidarity; they divided social solidarity into four categories: solidarity towards the community, the elderly, the sick and immigrants. They analysed the association between each form of solidarity and income inequality controlling for individual-level characteristic variables such as gender, age, marital status, education and income. The results showed that people have higher solidarity towards the elderly, the community and the sick but lower toward immigrants, and that income inequality has a negative and significant impact on all kinds of solidarity. Income level has a positive association with the feeling of solidarity, which means that the rich have more sense of solidarity than the poor. However, the interaction between income and inequality shows that the rich have a greater sense of solidarity, but that the level of solidarity decreases as income inequality increases for both the rich and the poor. There is a possibility of reverse causality, which means that less solidarity leads to higher income inequality because the lack of solidarity makes people dislike a redistribution policy, but Benabou and Tirole (2006) suggested that the causality runs in both directions. So it cannot be denied that income inequality has a negative effect on individuals' feeling of solidarity.

Income inequality hampers the accumulation of social capital not only through lower social solidarity but also through the political process. Research has shown that people

with low incomes are more likely to be isolated from civic engagement (such as participating in elections) because they feel more anxiety about their economic condition (Putnam, 2000). As a result, they have no-one to represent them and they are implicitly deprived of political power. This phenomenon becomes serious when income inequality increases. In addition, social trust becomes weaker as income inequality increases; people have less sense of the need to help each other, and this can cause more problems at the societal level, as well as the individual level.

2.4.3. Income inequality, individual's behaviour regarding marriage and family structure

Previous studies have argued that individuals' behaviour regarding marriage is affected by income inequality. Increases in wage inequality play a significant role in the decline of marriage. Gould and Paserman (2003) estimated that 25% of the reduction in marriages can be explained by increases in men's wage inequality over the past few decades. This is mainly because when income inequality increases, it takes more time for women to find financially suitable men, and men at the bottom of the income distribution become less attractive as marriage partners. So the financial cost of finding a suitable marriage partner increases and both women and men can see less incentive for marrying. In addition, the decline in marriage is connected to the increase in single motherhood.

Because some women regard marriage as a luxury but motherhood as essential (Edin & Kefalas, 2005 cited in McLanahan & Perchenski, 2008), an increase in the cost of searching for a marriage partner can lead to a greater possibility of them choosing to be a mother without marriage. In particular, the expected income of poor women with less education is low when income inequality increases, so the opportunity cost of bearing a child is lower for them (Gottschalk & Danziger, 2005). This impact can obviously lead to single motherhood. It has been widely reported that parents play an important role in the nurturing of children, so single motherhood is problematic for children's development. In fact, a large body of research has argued that living without a biological parent, especially a father, is related to a negative impact on children's cognitive and emotional development which is essential for them to be able to climb up the income ladder (McLanahan & Perchenski, 2008; Esping-Andersen, 2009). These studies have shown that children of single mothers are more likely to bear a child at an early age, to have less educational attainment and to live in poverty. It is certain that income inequality is a

salient factor in determining family structure; at the same time, income inequality is inevitably a mechanism for reproducing the inequality in the next generation, which mitigates against social mobility.

2.4.4. The impact of inequality on social and health problems in society

In the previous section, I reviewed studies of how income inequality affects individuals' emotions and behaviour. The problem is that the harmful impact of income inequality on individuals' emotions and behaviour is turning into the foundation for more serious problems in our society. As discussed above, income inequality is negatively associated with individuals' level of happiness, well-being and solidarity, their sense of belonging to their community and social trust, so it causes anxiety in individuals regarding their current social status and it hampers the functioning of society.

There are many studies which have shown that crime is higher in a society which is more unequal. Hsieh and Pugh (1993) reviewed 34 studies and found higher homicides rate in unequal societies. Blau and Blau (1982) suggested that violent crime is more common when a community has more heterogeneity as social difference creates social disorganization and latent animosities are widened. They used data from metropolitan cities in the US and found that income inequality had a positive relation with violent crime rates (murder, rape, robbery and assault), whereas the poverty rate was not a significant factor in the crime rate. They found, particularly, that income inequality within the same ethnic group was not very significant whereas income inequality between ethnic groups was quite significant. They therefore argued that income inequality is positively related to crime rates and that its impact is clearer when it is combined with other factors related to social class, such as ethnic groups. Kaplan *et al*. (1996) found that high income inequality was related to the high dropout rate in the US.

Wilkinson and Pickett (2007) reviewed a number of studies and found that income inequality had a significant positive relation with mental illness, homicide, low level of trust, low social capital and even low social mobility in both international comparisons and inter-state comparisons in the US. They combined ten social issues (trust, mental illness, life expectancy, infant mortality, obesity, education performance, teenage birth, homicides, imprisonment and social mobility) into a unified social and health index (Wilkinson & Pickett, 2009) and they found a correlation with income inequality: this

index was 0.9 in rich countries and 0.6 in the US states. The income level of countries measured by GNI *per capita* did not seem to have any correlation with the index in international comparisons and only a weak correlation in US states.

The impact of income inequality on various social problems also has a bad effect on the rich, as well as the poor. Leon *et al*. (1992) compared infant deaths per 1000 between Sweden and the UK and both countries were found to show a decrease in the infant death rate in the higher social class as measured by occupation group, but over all levels of social class, the infant death rate was higher in the UK. The overall death rate per 1000 between the UK and Sweden showed the same result (Vagero & Lundberg, 1989). Banks *et al*. (2006) compared the morbidity rate due to various diseases (diabetes, hypertension, cancer, lung disease and heart attack) between England and the US, and found that except for a few cases the morbidity rate was higher in the less educated group in both countries and higher in the US than in England; the US had higher income inequality than England. In other words, even the rich and the educated fare worse in an unequal society than in an equal society, so we can see that the rich are also affected by the income inequality of the community to which they belong.

These were, however, cross-sectional studies which did not consider the time-variant effect, so we also need to look at longitudinal studies because the impact of income inequality could be different according to the time span of the research. Time-series analysis has shown a mixed effect. Mellor and Milyo (2001) pointed out that there is no harmful effect of income inequality on public health over time, and Leigh (2009) argued that a cross-sectional study of income inequality and crime rate showed a significant association. In contrast, Clarkwest (2008) and Babones (2008) both showed that income inequality had a negative association with public health and life expectancy. Table 2.2 summarises recent studies of the relation between income inequality and social and health problems. 'Positive' means that income inequality has a positive relationship with the dependent variable of the study, 'negative' means the opposite.

Table 2-2 social / health problem and income inequality

Author (year)	Dependent variable	Methodology and data	Result
Hsie and Pugh (1993)	Homicide rate	Meta-analysis (34 studies)	Positive

Blau and Blau (1982)	Violent crime rate (murder, rape, robbery, assault)	Cross-sectional regression in metropolitan cities in the US	Positive for all violent crime rates
Wilkinson and Pickett (2007)	Social and health index	Comparing the correlation coefficients of 50 states in the US and 21 rich countries	Correlation coefficient was 0.9 in rich countries and 0.6 in US states
Kaplan *et al.* (1996)	Maths and reading scores, school dropout rate	Correlation coefficients of 50 states in the US	Positive
Mellor and Milyo (2001)	Infant mortality and life expectancy	Time-series regression, 30 countries for 30 years and 48 US states for 40 years	Positive, but no causal relationship
Leigh, Jencks and Smeeding (2009)	Mortality rate, violent crime rate, social capital and trust	Meta-analysis of previous studies	Positive in cross-sectional studies but absent in time-series studies
Babones (2008)	Life expectancy, infant mortality rates and murder rates	Cross-sectional regression using panel data from 1970 to 1995 from 126 countries	Negative for life expectancy, positive for infant mortality and murder rates

Finally, it should be noted that the effect of income inequality might be exaggerated because of individual characteristics since health problems or the crime rate might be due to individual characteristics such as family background, education attainment and so on. Some researchers used multi-level analysis to separate the impact of individual characteristics. Multi-level analysis is useful for dividing variables at a different level when micro variables are nested within a macro variable.

Subramanian and Kawachi (2004) reviewed multi-level analyses of the impact of income inequality on health status. They reviewed fifteen studies using data from the US and nine

of them showed a negative relationship between income inequality and health outcome, ranging over mortality, self-rated health, depression symptoms, hypertension, smoking, body mass index and sedentary behaviour, which meant that the impact of inequality on health outcome is potentially widespread. They also found that the impact of income inequality on health could be reduced when an individual's characteristic variables such as education attainment or income level are controlled for. In particular, controlling for education attainment reduces the effect of income inequality whereas sex, age and marital status do not make significant differences. Nonetheless, they argued that income inequality is still a very important factor in predicting health status. Actually, the size of the impact is quite controversial; some studies have claimed that the effect of income inequality is significant but that the size is only modest (Lynch *et al.*, 2004; Kondo *et al.*, 2009). Because there are only a few studies on this topic, it requires more study.

2.4.5. Summary: is there a causal relation between income inequality and social / health problems?

In this section, I shall review previous studies on how an increase in income inequality is related to an increase in various social problems. As already discussed, many studies have shown that an increase in income inequality is related to lower levels of subjective well-being and lower levels of happiness. In addition, high income inequality is related to changes in family formation and attitudes to marriage, which mitigates against social mobility. High income inequality is also related to high suicide rates, high crime rates and poor health status, particularly among people with relatively low educational attainment.

What we can see here, however, is only an association so it does not guarantee any causality between income inequality and social and health problems. It is very difficult to infer causality in the social sciences and it requires very complicated and rigorous statistical methods. Even so, we can see the mechanism or theory of how income inequality leads to social problems by reviewing previous studies in this area. One possible explanation is related to social differentiation. Increases in income inequality mean that the gap between levels of social status is getting wider and this leads to status anxiety which in turn generates stress in people. This process of social differentiation makes a society worse. This can be found in the results of studies which show that an association between income inequality and social and health problems gets weaker when other social differentiation variables are included. Some sociologists therefore argue that

income inequality is just one dimension of social differentiation so the impact of income inequality might be exaggerated and other social differentiations such as ethnic group might also play an important part in social and health problems (Deaton & Lubotsky, 2003). However, as we have seen in the work of Blau and Blau (1982), the impact of income inequality is still significant even when ethnic group is controlled for. In addition, Ram (2005; 2006) found that ethnic grouping cannot fully explain social and health problems and showed that income inequality is still very important. In addition, it is extremely difficult to measure social differentiation precisely (Wilkinson & Pickett, 2009) and because income inequality has a harmful impact on individuals' well-being level and sense of solidarity, this leads to a decrease in people's willingness to cooperate with one another (Putnam, 2000). The link between how the impact of inequality on individuals' emotions is connected to social problems seems to show a logical causal relation between income inequality and social and health problems.

Previous studies reviewed in this paper have shown the mechanism by which inequality brings about various social problems. Many studies show income inequality has a negative effect on society and hardly ever has a positive effect (Rowlingson, 2011). Of course, there might be other characteristics such as cultural or individual factors which affect social and health problems so certainly more research to test causality using statistical methods should be conducted, but the empirical evidence which exists so far still shows that causality is likely to exist between income inequality and social and health problems.

2.5. Conclusion: who is affected by income inequality?

In this chapter, I shall discuss how income inequality has come about in the developed world over time and review previous studies of how an increase in income inequality is related to an increase in social problems in our society. Income inequality had been regarded as an inevitable by-product of economic development, and it had been believed to decrease eventually as an economy grows. Furthermore, income inequality was sometimes considered as a motivation or an incentive for further economic growth. Poverty reduction is therefore frequently referred to as the main cause of social problems, so policy action and discussion had been concentrated more on poverty reduction than on income inequality. However, income inequality has continued to increase across the

world for the last two decades and studies have shown that we need to take it more seriously.

The studies reviewed in this chapter have shown that income inequality is neither inevitable nor necessary for economic growth. Some researchers have argued that income inequality actually impedes economic growth through the political and financial process, and that this reduces the size of any positive impact of economic growth on our society.

Income inequality has a more profound harmful effect on our society. It has a negative relationship with individuals' well-being, happiness and sense of solidarity. Income inequality also hampers the accumulation of social trust and the willingness of people to cooperate with one another, and also promotes differentiation of social status which generates status anxiety. All these negative impacts at the individual level are combined, which leads to a decrease in the social capital which is essential for the sustainability of our society. As a result, societies which are more unequal tend to do worse than an equal society. Empirical studies have shown that social problems such as homicide, teenager birth and imprisonment are more likely to occur in an unequal society. Unequal societies also tend to have more health problems. For example infant mortality, low life expectancy, obesity and mental illness are all more prevalent in an unequal society.

More research is clearly needed into causality using rigorous statistical methods, but the existing studies already provide ample evidence that increasing income inequality makes our society more vulnerable and disturbs the proper functioning of the society. Income inequality might not be a popular topic for politicians since it is politically a very sensitive issue, but previous studies have shown that policy action is required to stop the widening income gap between the poor and the rich. We see the negative impact of income inequality on our society so now we need to carry out more research into what factors are driving income inequality and the effectiveness of policy tools to contain income inequality without an economic recession. There have been many studies examining what factors drive income inequality. In subsequent chapters, therefore, those studies will be reviewed in order to identify ways in which we can stop any further increase in income inequality.

Chapter 3. Determinants of income inequality: the conventional idea

3.1. Introduction: Economic and political variables for determining income inequality

In Chapter 2, I reviewed studies of the harmful impact of income inequality on our society. We can see abundant evidence which shows how income inequality is related to the dysfunction of society, as well as a decrease in the quality of individuals' lives. The next question should therefore be 'what factors are driving income inequality?' Since income distribution is the result of complicated interactions between diverse factors in a society, it is not very surprising that there is no congruence over the main reason behind increasing income inequality

Studies into the determinants of income inequality can be divided into several categories according to their main dimension. First, there are many studies of the economic factors in income inequality. Most of the early studies focused on the economic dimension, such as labour market change due to technical development, the progress of financial liberalisation and trade openness.

Economic factors alone, however, do not fully explain the dynamics of income inequality, so researchers of income inequality have gradually enlarged the remit. Political institutions, including the social welfare system, are also considered to be important factors (Korpi & Palme, 1998) and the policy processes on how organized interests intertwine with each other are also an essential factor in analysing income inequality (Hacker & Pierson, 2010). Although some degree of income inequality is inevitable in a market economy system, political institutions and policy processes are important since they can affect the rules which shape the market system.

It is the so-called "market conditioning policies" (Kelly, 2009) which means that income distribution depends not only on economic activities but also on the policy processes behind how the government structures the market system. Political factors cover a wide range from the type of government and parliamentary system to social welfare institutions. A more detailed explanation will be provided later in this chapter. On the other hand, there are growing numbers of studies which have argued that sociological changes such as an aging population and changes in household structure also play an

important role (Esping-Andersen, 2007). In particular, these sociological changes are closely related to a welfare institution which is designed on the basis of traditional society so the interplay between sociological changes and welfare institutions affects income distribution.

In this chapter, therefore, I shall review the determinants of income inequality in two parts. In Section 3.2, I shall discuss the economic factors which are considered to affect income inequality. The relationship between income inequality and economic growth has already been discussed in Chapter 2. Income inequality affects economic growth but, as will be shown, economic growth also affects income inequality. In Section 3.3, I shall focus on how political variables affect income inequality. As discussed above, an increasing number of studies of income inequality have emphasized the importance of political variables to explain increases in income inequality.

3.2. The determinant of income inequality: economic variables

Many studies have accounted for income inequality from the economic perspective. Kuznets (1955) showed that economic issues are mainly about economic growth, changes in the labour market and the development of technology. OECD reports (2011; 2015) have also identified those variables as main drivers of income inequality. Technological development leads to changes in the labour market which lead in turn to changes in income inequality. In addition, an increasing number of studies have suggested that globalisation is also significantly related to income inequality. In fact, those variables are closely related to one another. In this section, I shall review the economic variables which affect income inequality, including a theoretical discussion and empirical results.

3.2.1. Technology and labour market structure

Technological developments have contributed to reducing the cost of production through improvements in automation and communication. This has opened new opportunities by helping many people out of the poverty trap (IMF, 2015). Technological developments are, however, also regarded as a main reason for an increase in income inequality, as the development of technology increases the demand for capital and for highly-skilled labour and this leads to a disproportionate increase in the income of the highly-skilled labour

force. In addition, automation eliminates jobs for low-skilled or unskilled workers so they face structural unemployment in the long term (Card & Dinardo, 2002; OECD 2011).

This is also in line with Kuznets's argument since the main force to produce an inverted-U curve is the reallocation of the labour force due to the emergence of a new industrial sector which is closely related to the development of technology. However, unlike Kuznets's expectation, the income gap between highly-skilled labour and low-skilled labour has been widening. As was discussed in Chapter 1, income inequality is increasing in developed countries as well as developing countries, and the skills premium which is measured by the relative earnings from employment after completing tertiary education compared with earnings after completing upper-secondary education shows that it has increased most in developed countries between 1997 and 2007 (IMF, 2015). Jaumotte (2009) tested the effect of technological development on income inequality using data from 51 countries over 23 years and found that technological development was significantly related to increases in income inequality.

Developments in technology also change the labour market structure. As discussed above, technological development leads to a disproportionate increase in the demand for highly-skilled workers and removes low-skilled or unskilled jobs. The OECD (2015: 29) argued that these changes lead to more inequality as they create an increase in job polarisation. This shows that the proportion of highly-skilled jobs increased from 28% to 38% between 1995 and 2010, whereas the share of routine-task jobs decreased from 53% to 41% and the proportion of low-skilled jobs increased from 18% to 21%. The decline of middle-skilled jobs and the increase in low-skilled jobs accompanied an increase in non-standard work contracts. Non-standard work refers to part-time or temporary workers. According to OECD data published in 2013, the proportion of non-standard jobs is more than 40% in Australia and Switzerland, and more than half in the Netherlands.

The increase in non-standard jobs is related to an increase in income inequality as low-skilled workers are exposed to lower wages and poorer labour condition. The income gap between standard workers and non-standard workers is larger at the bottom end of the income distribution, and non-standard workers are 20% less likely to receive training than standard workers (OECD, 2015). Consequently, non-standard workers, who are mostly low-skilled or unskilled workers, not only have less income but also have less opportunity

to receive training that could be useful to upgrade their skills and knowledge. In other words, low-skilled workers are likely to remain as non-standard workers in the long term.

Low-skilled workers not only have a lower wage but also a lower level of employment protection and this is also related to increasing income inequality. The OECD (2011) emphasized that the changes in institutions and regulations in the labour market are salient drivers of income inequality. Many OECD countries have implemented regulatory reforms which have loosened employment protection and lowered the replacement rate of unemployment benefit, which leads to income inequality amongst wage earners. In particular, non-standard workers are more vulnerable to those regulatory reforms. In addition, the decline in trade union membership could reduce the bargaining power of the labour force and lead to an increase in income inequality (Wilkinson & Pickett, 2010). Jaumotte and Osorio-Buitron (2015) found that a decline in unionisation was significantly related to an increase in the top-income proportion, and the OECD (2012) showed that a high proportion of non-standard workers play an important role in driving income inequality.

In brief, technological development is useful for economic growth because it reduces production costs and increases automation. It plays an important role in the decrease of poverty. However, it also leads to an increase in the demand for highly-skilled workers and eliminates jobs for low-skilled workers. Consequently, the skills premium for highly-skilled workers is increasing, whereas low-skilled workers have fewer opportunities for employment and are likely to be exposed to non-standard contracts, such as part-time or temporary work. Labour institutions such as employment protection or trade union membership are also changing into something more unfavourable for low-skilled workers. All these changes are drivers of an increase in income inequality in the developing world.

3.2.2. Globalisation

Since the 1990s, economists have investigated more diverse factors driving income inequality. In particular, as globalisation has grown, the factors related to globalization, such as trade openness and financial market liberalization, have been examined in many studies. Globalisation is expected to contribute to economic growth by stimulating the efficient allocation of resources. However, it is also frequently referred to as one of the main drivers of increases in income inequality.

The concept of globalisation is not easy to define, as it is a mixture of diverse factors. Dreher (2006) stated that globalisation consists of three dimensions: economic, political and social. He suggested that the impact of globalisation on income inequality must be diverse by the dimension of globalisation (Dreher & Gaston, 2008). He stated that economic globalisation is related to an increase in income inequality since economic globalisation includes trade openness and an increase in the demand for skilled workers, so the wage gap can widen between skilled and unskilled workers.

On the other hand, the impact of political globalisation is not clear since there are two competing perspectives. Blank and Freeman (1994) stated that welfare states are faced with severe international competition, so they try to reduce welfare benefits in order to promote competitiveness in the international market. They argued that excessive social protection and assistance has produced rigidity in the labour market and act as a disincentive for the unemployed, so governments wanted to reduce welfare benefits throughout the 1980s and the 1990s, and the reduction in welfare benefit was related to an increase in income inequality. Huber and Stephens (1998), however, stated that welfare benefits would increase the protection of unskilled workers from the consequences of globalisation as globalisation stimulates competitiveness and brings higher rewards for highly-skilled workers. The income gap is widening between high and low-skilled workers and the demand for high welfare benefits increases because of the widening income gap.

Dreher (2008) examined the relationship between income inequality and each dimension of globalisation using data from 1970 to 2000 and found that overall globalisation exacerbates income inequality and that it is significant in OECD countries but still vague in non-OECD countries. Thereby, economic globalisation decreases income inequality whereas the coefficient of political globalisation is close to zero and neither of them is significant in OECD countries. For non-OECD countries, economic globalisation decreases income inequality but not significantly, and political globalisation is related to significant increases in income inequality.

Other studies have suggested that the relationship between economic globalisation and income inequality can go either way. Economic globalisation is commonly operationalised in two ways; trade openness and financial globalisation. Trade openness involves removing barriers to international trade so that goods and services can be accessed

regardless of borders between countries. Financial globalisation means eliminating the barriers that hinder the free movement of capital to promote the efficient allocation of resources and international risk sharing.

Trade openness is also regarded as having mixed results as it increases the skills premium on the one hand, but on the other it could also increase real wages by lowering prices (Munch & Skaksen 2009). On the contrary, the relationship between financial globalisation and income inequality seems to be clearer. The increase in financial globalisation leads to a concentration of foreign assets and capital in the highly-skilled sector and it increases the demand for highly-skilled workers (IMF, 2015). In addition, foreign direct investment could lead to skill-specific technological changes which would increase the wages of workers with specific skills (Velde, 2003).

Greenwood and Jovanovic (1990) demonstrated the effect of financial globalisation on income inequality by using data covering a long period, almost an entire century. Their findings showed that financial globalisation is more favourable for rich people but that trade openness is not. Roine *et al*. (2009) investigated the determinants of income inequality using panel data from sixteen countries over the whole twentieth century. Their findings showed that economic growth is pro-rich and that financial development increases the income of the rich whereas trade openness is more favourable for poor people and decreases the incomes of the rich. Freeman (2010) also showed that an increase in financial flow, particularly foreign direct investment, was significantly related to an increase in income inequality in both developed countries and emerging economies. An IMF report (2015) found that trade openness is not significantly related to changes in income inequality whereas financial openness is.

In brief, globalisation seems to have a significant relationship with changes in income inequality. As globalisation consists of several sub-concepts, its impact on income inequality is different according to the dimension of globalisation. Empirical studies have shown that trade openness is either not related to income inequality or decreases it, whereas financial globalisation is significantly related to increases in income inequality. A possible explanation for this is that trade openness can increase real wages by lowering prices but that financial globalisation leads to a concentration of capital on specific industries which are likely to be highly-skilled, so it is related to an increase in income for

workers with specific skills and knowledge. In addition, the free movement of capital is likely to maximise profits, so it also leads to inequality in wealth

3.2.3. Fiscal policy: tax policy and income inequality

In Chapter 2, two questions were raised regarding Kuznets's inverted-U hypothesis, the second of which was whether income inequality can be gradually relieved without government intervention. This question is about the necessity of fiscal policy, including redistributive policy. Many studies have discussed the relationship between economic growth and fiscal policy but studies discussing fiscal policy and income distribution have been relatively scarce until recently (Galo & Sagales, 2009).

Piketty (2013) argued that income inequality is an inevitable phenomenon as it comes from the very nature of capitalism. He insisted that economic profit is distributed to capital and to the labour force, and return on capital is higher than the return for the labour force, so the income gap between capital owners and wage earners has continued to increase throughout the history of capitalism. According to his argument, income inequality is the result of the mechanical process of capitalism. This is opposite to Kuznets's theory and income inequality cannot be relieved without government intervention if he is right. It is therefore more important to see the relationship between redistributive policy and income inequality.

Fiscal policy usually refers to a policy that deals with government revenue (tax) and expenditure. It is a broad concept that covers the tax system, a redistributive system and other government expenditure such as public transport, health, education and defence (Easterly & Rebelo, 1994), but studies of income inequality have mostly focused on tax and social spending (IMF, 2014; Perotti, 1996; Basset, Burkett & Putterman, 1999). Those variables are directly related to income inequality but other government expenditure, such as on education, also affects income distribution indirectly (Alfonso *et al.*, 2010).

The effects of social spending are discussed in Chapters 4 and 5. In this section, I shall consider the big picture on the relationship between income inequality and the tax system, and the relationship between income inequality and public expenditure.

It is believed that any increase in the tax rate means increased tax on the rich which will lead to less income inequality. Previous studies, however, have shown that this

relationship can be different according to the different kinds of tax. Meltzer (1981) showed that income tax is progressive but that payroll tax, social security tax, sales tax, VAT and excise tax are regressive, although corporate tax is controversial. Conventionally corporate tax is considered as a progressive tax because it is imposed on capitalist activities, but the economic effect is different, especially in an open economy, since it is easier for capitalists to shift their tax burden onto the working class in an open economy by moving their capital to different countries which have a lower corporate tax rate. Meltzer's empirical study supported this argument by showing that the association between corporate tax rate and income inequality is weaker in an open economy but that an increase in corporate tax is still related to an increase in income inequality in both cases. Martinez-Vazquez and Vulovic (2012) carried out extensive research into the mixed impact of tax and government expenditure using data from 150 countries over about thirty years, and they found that increases in the tax rate (both income tax and corporate income tax) were related to a decrease in income inequality but that excise tax was related to an increase in income inequality..

On the other hand, Harberger (1995; 2006) showed that there is no clear association between a progressive tax and income inequality. He stressed that income inequality measured by the Gini index had decreased from the 1970s to 1980, but began to increase again from the middle of the 1980s and then increased rapidly in the 1990s. In contrast, the progressivity of income tax has continued to decrease over the last 25 years, so there is no clear association between the two factors. Duncan and Peter (2008) showed that progressive tax has a positive impact on income distribution, but that inequality measured by individual expenditure and not by income did not improve much. Immervoll and Richardson (2011) investigated the trends of tax policy and government expenditure in OECD countries and found that an increase in tax rate was significant, but that the impact was weaker than in a direct benefit system.

3.2.4. Public expenditure and income inequality

Regarding the relationship between public expenditure and income inequality, previous studies have shown that an increase in public expenditure on the police, fire protection or defence is not related to changes in income inequality. Boustan *et al.* (2010) and Orsberg and Smeeding (2004) showed that an increase in public expenditure in the US was not

related to changes in income inequality as most of the increase in public expenditure occurred in those fields.

As discussed above, however, some studies have shown that an increase in public expenditure on education is related to changes in income inequality. Some scholars have argued that education is a good instrument by which to achieve better income distribution by stimulating social mobility. This is one reason why the post-war governments in most developed countries attempted to expand public education. They believed that they could weaken the relationship between parents' economic capacity and their children's educational achievement by strengthening public education so that children can have more opportunities than their parents had.

Other scholars have argued that we do not have concrete evidence for this. Previous studies which have attempted to explain the relationship between education and income inequality can be divided into three categories. The first is human resources theory; supporters of this view insist that the purpose of education is to improve the capacity of the individual so that it can lead to a higher income in the labour market (Schultz, 1963). The second category is to analyse the relationship between education and the labour market. Supporters of this view insist that the effect of education is closely related to the supply and demand of the labour market and to shifts in the industrial structure (Knight & Sabot, 1983; Teuling & Rens, 2003; Crenshaw, 1992). The third category focuses on the relationship between education and social mobility (Blau & Duncan, 1967; Beller & Hout, 2006; Sorensen, 2006). Supporters of this view have argued that education affects income inequality through inter-generational occupation shift. In other words, education can offer opportunities for children from working class families to move up to a higher social class.

Schultz (1963) suggested that education is a good way to lower income inequality, so supporting public education is an effective way to achieve better income distribution. He regarded education as one way of investing to improve the quality of individuals and that the return for education can be measured by income earned by the educated individual. Thus, the effect of additional education can be measured by the marginal increase in the income of the individual and he found that an increase in years of schooling was associated with an increase in the income of individuals, so supporting public education is a good instrument for helping the poor out of poverty and ensuring a more equitable

income distribution. Saint-Paul and Verdier (1993) and Zhang (1996) also argued that spending on public education lowers income inequality. Sylwester (2000; 2002), however, insisted that supporting public education can promote income inequality only when poor families are too poor to send their children to school, so they still cannot benefit from public education. On the other hand, Jimenez (1986) and Field (1980) argued that increasing spending on public education cannot lower income inequality.

There have been some studies which have shown more complicated results. Knight and Sabot (1983) showed that the impact of education could run in different ways, the composition effect and the wage compression effect. The composition effect means that expanding education spending results in an increase in income inequality since it increases the numbers of the educated who are paid better than the uneducated. The wage compression effect means that education spending decreases income inequality since more people are educated so the labour supply for the well-paid, highly-skilled jobs increases. Therefore, the effect of education on income inequality can be different according to the size of each effect in the different conditions which a country has.

Teulings and Rens (2003) pointed out that the impact of education should be divided into long-term and short-term impact. They investigated the relationship between income inequality and educational attainment using data from 114 countries for the thirty years from 1960 to 1990 and found that the relationship between educational attainment and private return was negative in short-term, which means that the private return falls when education level increases because of the increase in the supply of high-skilled workers. Thus, an increase in educational attainment is likely to compress the income gap between the poor and the rich, so income inequality is reduced in the short term. In the long term, however, an increase in educational attainment leads to the development of advanced technology which brings about an increase in the demand for highly-skilled workers. Therefore, an increase in educational attainment is likely to stimulate an increase in income inequality in the long term by creating an increased demand for highly-skilled workers.

Crenshaw (1992) showed that the impact of education attainment on income inequality depends on the degree of economic development. He examined the impact of education and political democratic rights on income inequality using data from 55 countries, including both developed and developing countries, from 1965 to 1975, and he found

that both the educational enrolment rate and the degree of political democracy actually had a curvilinear effect on income inequality. This implies that an increase in educational enrolment and the development of political democracy are associated with an increase in income inequality until a threshold is reached, and then they are related to abating income inequality. The logic which he proposed was that educational expansion is focused on business skills and entrepreneurial capacity for a few people in a society at first, and that after these entrepreneurs have succeeded in their goal, then the demand for the education of workers increases.

Blau and Duncan (1967) approached this issue from a different perspective. They analysed the effects of father's education level and occupation on children's education level and occupation and found that when the father's education level is higher, his children's education level is likely to be higher too. In this respect, expanding public education can decrease income inequality by improving social mobility in society. However, the effect of education is different in different countries. For example, this association is weakened in social democratic welfare states (Sorenson, 2006) since the government provides children with a more extensive public education so that they can benefit from public education regardless of their family background. Beller and Hout (2006) examined the relationship between social fluidity and access to education in eighteen developed countries and found that the effect of education on social fluidity was more sensitive in corporatist and liberal welfare states, which means that expanding education is important for promoting the equality of the society in those countries. However social democratic and post-socialist welfare states are not very sensitive to the effect of education since social fluidity in those countries is not closely related to access to education. They explained that equality of opportunity is essential for improving inequality; education is just one way to stimulate the equality of opportunity. Since social democratic welfare states have various social institutions to improve the equality of opportunity (such as a public child-care system), the dependence on education is lower than in other welfare states in terms of improving social fluidity.

Previous studies have shown that an increase in public expenditure on education is significantly related to changes in income inequality. Some researchers have argued that the relationship between the two is insignificant, but most of the empirical studies have shown that there is a significant relationship. Various theoretical discussions have tried to

explain this relationship. As reviewed above, some have argued that an increase in public education is related to investment in human resources because it helps the poor to get out of poverty. Other researchers have argued that public education increases the number of well-educated workers who are paid better than less-educated workers, so income inequality can increase. Another view is that an increase in public education is related to increased opportunities for the poor so it is related to an increase in social mobility, which decreases income inequality. Other researchers have argued that the impact of public education on income inequality is different according to the different institutional designs of a welfare state and to the stage of economic development. There have been various theoretical discussions about this, but it seems that increases in expenditure on public education are generally related to increases in income inequality.

In summary, previous studies have shown that both tax policy and government expenditure play an important role in determining income inequality but that the significance and the size of the effect seem quite different in terms of the sub-components of each policy area. Increases in income tax and corporate tax seem to be associated with a decrease in income inequality, but the significance of corporate tax declines as economies transform to an open economy. In the case of government expenditure, most studies have shown that it does not have a significant effect on income inequality except for social expenditure. The effect of social expenditure will be discussed in a later chapter.

3.3. Political institution factors

As was discussed in the previous chapter, income distribution is the consequence of a complicated interaction between different actors in a market economy. Income distribution is therefore not fully explained by economic factors alone. As discussed in the previous section, Piketty (2013) argued that income inequality is due to the very nature of capitalism. However, we can see diverse income inequalities in most developed capitalist countries (Hopkin & Lynch, 2016). On the other hand, many studies have argued that income inequality is the result of political action.

Hacker and Pierson (2010) showed that the outcome of income distribution is considerably affected by the policy process in the US. They showed that income inequality in the US is becoming a serious issue, especially when we see the ratio between the top 1%

and the rest of society. They insisted that increases in income are getting bigger at the higher income level, and that is not fully explained by economic factors such as the labour market structure or technological development. Those economic factors partly explain income inequality but do not explain the hyper-concentration of income for the top 1%, and they emphasized that the government actually has many tools by which to intervene in the market and the economy. This leads to the need to review the political factors to understand income inequality more accurately. In fact, many studies have examined the impact of political factors in income distribution. The type and partisan identity of a government are often regarded as determinants of income inequality, and the degree of democracy, the level of corruption and the accountability of a government are considered salient factors. Hacker and Pierson (2010) suggested that existing political factors are not sufficient so we need to extend our concern to the whole policy process. Policy outcome is likely to be dominated by well-organized interest, and rich or private companies are usually better organized to represent their own interests. Thus, policy outcome is more in favour of the rich and of private companies, and this process is a very relevant factor in driving income inequality. The details of these political factors are reviewed in the following section.

3.3.1. Political institution, veto points and partisan identity

One of conventional idea on politics and inequality is the median voter theory which was proposed by Meltzer and Richard (1981). They argued that a high level of income inequality generates pressure for greater redistribution. They assumed that political power is more evenly distributed among voters than economic power so that the majority of voters are willing to vote for greater redistribution when income inequality is very high. This theory simplifies voters' behaviour and explains how income inequality is changed by political preference. However, this theory focuses on individuals' behaviour and neglects the macro view.

First, the importance of the partisan ideology of a government and its distributive outcome has a long history of debate in the social sciences (Castles, 1982). Bartel (2009) argued that the partisan identity of the president has played an important role in income inequality in the US through an expanding welfare effort since the Second World War. He measured income inequality as an 80:20 ratio, which is the ratio of income at the eightieth and twentieth percentiles. What he found was that income inequality becomes

more serious when a Republican president takes power, whereas it is abated when a Democratic president takes power. Hicks and Misra (1993) and Kittle and Obinger (2003) found that social expenditure increases when left-leaning governments take power, so income inequality is likely to be reduced when a left-leaning government is in power.

Other researchers have argued that the effect of partisanship on income inequality is limited. Neither Garrett and Mitchell (2001) nor Siegel (2007) found any significant effect of the partisanship of the government on welfare effort. Iversen and Cusack (2000) examined government ideology and the social transfer programme and found that they were statistically insignificant. Those studies did not address the direct effect on income inequality, but it can still be inferred that the limited impact on welfare effort or social transfer is related to the limited impact on income inequality. Hacker and Pierson (2010) also showed that income inequality measured by the ninety-ninth percentile to the twentieth percentile has continued to increase regardless of the partisan identity of the president in the US.

Previous studies of the politics of redistribution have neglected the importance of the political institution. Schmidt (1996) suggested a reason why the partisanship of a government fails to influence welfare policy. He argued that the effect of partisanship is limited by the institutional characteristics in which governments operate. In other words, if the political institution is based on a consensus-based system or co-governance, then it is more difficult to change the current policy because there are more political actors who can veto the policy in a consensus-based institution. Consequently, a political institution with more separated and independent authority is likely to hinder any kind of change in policies, either expanding or retrenchment, in a welfare state. Kühner (2010) also argued that the influence of partisan ideology depends on the political institution, and a change of ideology is associated with a higher level of policy changes with minimum veto players, and it is associated with a lower level of policy change with maximum veto players. Thus, either the reduction or the expansion of a welfare effort is considerably affected by a political institution, rather than by the partisan ideology of the government. In other words, partisan identity cannot play a significant role in income distribution as existing political institutions limit its impact.

Regarding the distributive outcome of a political institution, Birchfield and Crepaz (1998) examined the impact of political factors on income inequality using data from eighteen

OECD countries. They divided the constitutional system into two categories. One was a consensus model which is associated with parliamentarianism, strong bicameralism and federalism. The other is the majority model which is associated with presidentialism, unicameralism and unitarianism. They tested the hypothesis that the consensus model is associated with low-income inequality as a radical change in redistributive policy is more difficult under the consensus model. They found that consensus democracy is negatively related to the income of the top 20%, and in particular that federalism is significantly related to income inequality.

They also considered the number of veto points in the political system as an independent variable; the number of collective veto points is negatively related to income inequality whereas competitive veto points are more positively related to income inequality. Collective veto points emerge from institutions in which different political actors perform in the same institution, and competitive veto points take place when different political actors interact through separate institutions with mutual veto powers. The results showed that collective veto points are negatively related to income inequality as they predicted. They stated that competitive veto points take place when the representatives of the institution interact with each other in separate institutions with mutual veto points, so it is more difficult to change the *status quo*. In brief, income inequality is likely to be high when power is more concentrated, such as in a presidential system or unicameralism.

These studies showed that the political dimension, as well as economic factors, has an influence on income inequality. The political partisanship of the government also plays an important role in shaping income inequality, but recent studies have shown that the political institution that governments act within also has a significant impact on income inequality. Political institutions matter in income inequality, but the process of how institutions are determined is also important in determining income inequality.

3.3.2. Policy process and income inequality

Hacker and Pierson (2010) pointed out that the existing economic factors on income inequality neglect the role of the government. As reviewed in the previous section, the political partisanship of the government has a significant impact on income inequality but its impact is limited by the political institution in which the government performs. However, the ability of the government is limited by not only official political institutions,

but also by the organized interests of various groups in the society. Income inequality will increase when the economy grows if the rich and influential groups dominate the policy process of government. Benabou (2000) and Stiglitz (2012) showed that redistribution is not likely to occur when the rich have more political influence than the poor.

Hacker and Pierson (2010) also put forward a more detailed explanation for how the rich have more power than the poor do in the decision-making process for redistribution. They argued that the policy process is the "politics of organized combat" (Hacker & Pierson, 2010: 169). Policy change takes place usually when governments want to trigger it, but sometimes a government fails to update policy because of organized groups. Organized groups can be political actors or business organisations. For instance, the financial industry lobbyist wants to defend the hedge fund tax break so the government's attempt to abolish the tax break inevitably fail.

This failure to change policy occurs because policy decision-makers are more sensitive to organized groups than to unorganized voters. In the context of American politics, the influence of middle-class organisations declines due to the decline in labour power and the increasing importance of money in politics. Consequently, policy changes are in favour of the rich and of businesses. Progressivity in the tax system is entirely absent and corporate governance allows executives to receive huge amounts of compensation. In addition, regulation of the financial market is relieved, which allows financial professionals to earn much more than uneducated workers.

In summary, economic factors seek to explain income inequality through the principle of the market system, such as changes in the demand and supply of labour. However, the policy process is related to how to control the principle of the market system. The trickle-down effect of economic growth could be weakened if strong interest groups dominate the policy process, as governments are likely to be more sensitive to organized interests.

Hacker and Pierson (2010) focused on income inequality in the US, whereas Matthijs (2016) attempted to explain income inequality in Europe. He argued that income inequality in Europe is the result of the institutional structure and has been promoted by politics since the late 1990s. The political process in the fiscal policy of Europe is led by an independent central bank which has a strong belief in price stability. Discretion on the fiscal policy of each member state is seriously limited by the central bank, which is one of the main reasons for increases in income inequality. What Matthijs argued was that

financial interests and big business lobbies have great power in politics in Brussels, and the opinion of a member state is not well reflected in the policy process. The increase in income inequality in Europe is the result of this institutional structure.

3.3.3. Corruption, accountability and income distribution

Chong and Gradstein (2007) showed that income inequality is closely related to the quality of the political institution, especially the rule of law, corruption and democratic accountability. They assumed that individual income is the function of the individual ability variable and that individuals allocate income between consumption and 'unproductive' investment in rent seeking. This means that an individual's rent-seeking behaviour depends on the quality of the institution, so the inequality is constant and determined by individual ability in a good institution when the institution is good, whereas income inequality increases over time when the institution is bad. They examined the relationship between income inequality and the institution measured by the ICRG index (ICRG stands for International Country Risk Guide and it includes government stability, corruption, the rule of law, democratic accountability and bureaucratic quality) using data from 121 countries from 1960 to 2000. As expected, the results showed that the ICRG index was negatively related to income inequality and that all the variables were significant. The rule of law has the biggest impact on income inequality, followed by corruption and democratic accountability. They found that the contribution of the institution to inequality causality was around 33% in total linear dependence, and the contribution of the inequality to the institution was about 64%. It seems that those two factors reinforce each other and that study showed that strong accountability, less corruption and a well-established the rule of law can lead to less income inequality.

In fact, this relationship can go either way, as Easterly (2001) and Keefer and Knack (2002) argued that high income inequality is related to lower quality in a political institution. McFaul's (2002) description of a Russian case is an example of this. According to his findings, a small group of businessman gained access to political power in Russia after massive privatisation in the 1990s, and they pursued their own interests, so they had the power to hinder institutional development to protect the interests of the smaller shareholder. This has also happened in some Latin American countries, where the ruling

elites, including large businesses, military personnel and high-ranking civil servants, wanted to increase their own interests and strongly damaged the interests of small businesses, and this led to an increase in the black market and the informal economy (Kaufman, Mastruzzi & Zavaletta, 2003).

In summary, the direction of the causal relationship between income inequality and the quality of the institution is not clear, but it looks certain that income inequality is closely related to the quality of the institution.

3.4. Conclusion

In this chapter, I have reviewed previous studies of the factors which affect income inequality. Various studies have explained what factors drive or constrain income inequality so in this chapter I divided previous studies into two parts, economic factors and political factors. Economic factors affecting income inequality are mainly focused on economic growth, globalisation, technological development, changes in labour market institutions and tax/public expenditure. Traditionally, it is believed that income inequality increases in the early stage of economic development and is relieved in the later stage, but empirical studies have shown contradictory results, so further research is required. Technological developments lead to a high demand for highly-skilled workers and that leads to an increase in the skills premium. At the same time, technological development also leads to increased automation, which removes jobs for low-skilled workers. Low-skilled workers therefore suffer from long-term structural unemployment and they are exposed to non-standard contracts which only offer unstable employment. Consequently, technological development brings changes in the labour market so the income gap between highly-skilled workers and low-skilled workers is likely to increase.

Globalisation is also regarded as an important factor in income inequality, but the direction and size of the effect are still controversial, although it seems that trade openness could work to reduce income inequality whereas financial liberalisation has been associated with an increase in income inequality in most studies. Increase in tax rates and progressivity are significantly related to changes in income inequality. High expenditure is not necessarily related to a decrease in income inequality, but previous studies have shown that an increase in expenditure on public education is significantly related to a decrease in income inequality.

Economic factors affecting income inequality are based on the fact that the market system inevitably generates income inequality, but some studies have pointed out the role of politics in establishing control of the market system. They have insisted that income inequality is generated by the market mechanism but that it is politics that make the rules for controlling the market system. The political partisanship of the government has been regarded as an important factor which affects income inequality, but recent studies have argued that the political institutions in which political actors perform are more important. Studies of political institutions have shown that the number of veto players in the policy process and the type of government play important roles in income distribution. Empirical studies have shown that income inequality is likely to be low when power is spread across the institutions. In addition, recent studies have shown that the policy process on how interests between political organizations are decided and coordinated is an important factor in income distribution. In other words, policies are decided by the coordination of interests among political organisations, so policies are likely to be favourable to those who have strong political and economic power. Consequently, policies to support the poor and reduce the income gap are likely to be neglected or excluded in the policy process.

Although income inequality is generated by the market mechanism or by political power, a government effort to correct income distribution ex-post should be considered as a determinant of income inequality. As discussed in Section 3.2.3, previous studies have shown that a redistributive policy is significantly related to changes in income inequality. Redistribution is one of the main features of a welfare state, and its path for development and institutional design varies between countries. In the next chapter, I shall therefore review governments' efforts to manage social welfare, such as how it started, how it has developed and how it affects income distribution.

Chapter 4. The welfare institution and income inequality

4.1. Introduction: the welfare state institution

The welfare state as an institution is very important factor in determining income inequality. Barr (2004: 7) defined the reason for a welfare state as follows: "The welfare state exists to enhance the welfare of people who (a) are weak, vulnerable, largely by providing social care, (b) are poor, through redistributive income transfer, or (c) are neither vulnerable nor poor, by organising cash benefits to provide insurance and consumption smoothing, and by providing medical insurance and school education".

So one of the main roles of a welfare state is to provide social protection for all who are in need of income support from the government. In spite of a common general goal to provide social protection to all vulnerable groups, the way to provide social protection differs in different countries as the welfare state institution has been shaped and developed in the context of the politics and economics of each country. Differences between countries in terms of politics and economics in the welfare state are closely related to determining the level of welfare effort and the institutional design of a welfare state. Levels of income inequality and poverty can be considered as indicators of the performance of a welfare state, and it is expected that the performance of welfare states will be different according to how the institution is designed and how much effort a government puts into maintaining a welfare state (Kersbergen & Vis, 2014).

Many studies have argued the welfare state has a significant effect on income inequality (for example, Kangas & Palme, 2000; Korpi & Palme, 1998). Some studies have examined the relationship between the welfare effort and income distribution, and others have looked at the relationship between the institutional design of a welfare state and income distribution. In this chapter, therefore, a review of previous studies of how the welfare state emerged and developed will be presented as well as empirical studies which have examined the relationship between a welfare state and income inequality. In addition, this chapter also shows how the welfare state has recently been transformed.

This chapter is structured as follows. The following section discusses why a welfare state is required and how it is established. In fact, there are many theories and studies about this which have been put forward, but here this topic will be reviewed only briefly

because of lack of space. After this, a discussion will be presented about how and why welfare states have developed in various ways. This is closely related to the classification of the institutional design of the welfare state.

As already mentioned, although the role of the welfare state to provide protection and share social risks is a common factor, the way to achieve it is different in countries for a variety of reasons. Each country has a different concept of social rights and duties and pursues different values to ensure them, such as freedom, equality or solidarity. These differences by countries lead to different welfare state institutions and different institutional designs also lead to difference consequences in terms of income inequality. This section includes a review of empirical studies of how the institutional design of welfare states affects income inequality. The discussion on how to classify the welfare state is also related to the level of welfare effort which a government makes, so a discussion on how to measure welfare effort follows. This is the so-called 'dependent variable problem' in comparative welfare state research and it is a very complicated and controversial issue how we can measure welfare states' effort and classify the institutional design of a welfare state, so there are various ways to estimate the welfare efforts of different countries (Tanzi, 2000; Kühner 2007; 2015). In addition, reliable data on this topic have only recently become available. This section reviews the expenditure-based measurement which is the most frequently used measure and the social citizenship-based measurement which reflects qualitative changes in the welfare state. Each measurement has its own advantages and disadvantages so this section includes a discussion about each measurement and reviews empirical studies of the effect of welfare effort on income inequality.

4.2. How to measure the welfare effort.

Each country has a different logic and a different background to the development of its welfare state, so countries have different levels of commitment to the welfare state. One of the main roles of the welfare state is to enhance the welfare of vulnerable groups and offer social protection for all, so it can be inferred that high commitment to the welfare state is related to lower income inequality. So the amount of resources that a government puts into its welfare state is important in terms of income inequality.

However, it is difficult and complicated to measure the welfare effort of a government, so there is a long-running debate on how to measure the welfare effort. There are two most frequently used measurements for assessing a welfare state, although there are various other measurements that have been attempted in previous researches. The first is the financial approach, such as social expenditure, and that has been used conventionally. The second is a social-citizenship based approach such as a de-commodification index or generosity score. Each measurement has its own advantages and disadvantages so neither of them has sufficient power to end this debate.

This debate is salient to exploring the drivers of income inequality. As already stated, welfare effort is closely related to changes in income inequality so we could have a spurious result if we were to select an irrelevant measurement. There is no perfect measurement so far, so we need to keep in mind the advantages and limitations of each measurement when we interpret the empirical results. In this section, therefore, discussions on how they are measured and the advantages and disadvantages of each approach will be reviewed.

4.2.1. Financial approach: based on social expenditure

4.2.1.1. Aggregated social expenditure

The most widely used measure is aggregated public social expenditure as a percentage of gross domestic product (GDP) (Wilensky, 1975). This shows a country's effort in the reduction of poverty and inequality, but only in financial terms (Castles & Mitchell, 1992). Many previous studies used social expenditure as a proxy for welfare effort, especially in quantitative comparative research, but this was mainly due to the availability of data rather than intrinsic value (Castles, 1989) since aggregate social spending does not show the welfare effort very well because it does not reflect the details of the welfare institution, such as coverage ratio or replacement rate. However, it had been almost the only data set which was available for use in comparative studies (Castles & Mitchell, 1992), and it is very simple and straightforward, so there are many studies which have examined income inequality and public social expenditure.

The most noticeable advantage of the social expenditure measurement is its availability and accessibility. Data on social expenditure are easily accessible in data sets established by the OECD or Euro-stat. The availability of data is important, particularly for

quantitative research. Advanced and elaborate statistical skills are not possible if there is no data that we can use. For this reason, the availability of social expenditure data compared with other indicators is quite an important advantage for the researcher.

However, it is still controversial, as social expenditure reflects only quantity, not quality, so it is hard to reflect the changes in the quality of a welfare state. For example, social expenditure would increase when there is high unemployment in a time of economic crisis, and it would still increase when the benefit level decreases if the number of unemployed people increases more. In this case, it is not relevant to say that the welfare effort of a government is increasing or that we would have a more generous welfare state even though social expenditure is increasing. Social expenditure also does not consider the degree of social solidarity or social citizenship, which is a very salient aspect of the welfare state (Esping-Andersen, 1990). Sometimes the approach based on the expenditure even distorts the effort itself and changes in the welfare effort, such as the increase in total expenditure under the Thatcher government due to an increase in unemployment, rather than an increase in the benefit level of the welfare state (Esping-Andersen, 1990).

Scruggs and Allan (2006) showed that welfare states' efforts or retrenchment measured by aggregated social spending do not capture the reality of the situation because increasing total spending may coexist with lower individual entitlement. Social expenditure also provides little information about the level of social protection for the poor at the most risk. Problems of social expenditure can be summarised in three points. First, social expenditure does not show the size of the dependent population. If more people become unemployed, then total expenditure on unemployment benefit would increase even though the level of benefit decreases. Castles (2004) also criticised it because it does not consider changes in welfare need. The second problem is denominator issues, as social expenditure does not capture the difference in economic growth. For example, the ratio of social expenditure to GDP in the UK and Ireland increased by 3% a year until 2007, but Ireland's economic growth had averaged 6.2% since 1983 whereas that of the UK averaged 2.7% per year. So considering the economic growth rates, welfare retrenchment was more severe in Ireland but it cannot be captured if we use social expenditure as a measure of welfare effort (Adema *et al.*, 2011). The third problem is taxation. The tax system is used as a transfer mechanism with tax credits being

used as an instrument to help poor households or individuals by relieving their tax burden, but it is not included in social expenditure. Thus, we can underestimate welfare effort if we do not consider changes in the taxation system (Adema *et al*., 2014).

In addition, social expenditure data provided by the OECD also has its limitation because it does not cover education spending and shows inconsistency in the classification of mandatory and voluntary payments (Deken & Kittel 2007; Adema *et al*., 2014; Kuhner, 2015).

Many researchers have proposed other indicators for welfare effort based on social expenditure but more elaborate. For instance, Kittel and Obinger (2002) proposed first order differences to see changes in welfare effort and Clayton and Pontusson (1998) computed standardised social expenditure measurements. Castles (2002; 2004) showed disaggregated spending at the branch level. In the following section, those indicators will be discussed in turn.

4.2.1.2. Elaborating social expenditure by disaggregating and standardising

Castles (2002) attempted to elaborate social welfare spending by using a disaggregated expenditure approach. The critiques of this approach usually say that welfare benefit is more related to the eligibility criteria for recipients and the generosity with which individuals are treated, not to the total amount of money spent, so we cannot compare welfare state efforts or see the trajectory of welfare reform if we just focus on aggregate social expenditure (Castles, 2008). However, Castles (2002) argued that we can still see those things by the expenditure approach if we can disaggregate the social spending into several categories. The OECD social expenditure database begins to provide data in more detailed categories. When we use aggregate social expenditure, a decrease in one social policy area can be compensated by an increase in another area, so we cannot see the change in total. However, disaggregated social expenditure helps us overcome this problem. The OECD social expenditure database consists of thirteen categories representing policy areas (OECD, 2000):

1. Old age cash benefits 2. Disability cash benefits 3.Occupational injury and disease

4. Sickness benefits 5. Service for the elderly and disabled 6. Survivors

7. Family cash benefit 8.Family service 9. Active labour market programmes

10. Unemployment   11. Public expenditure on health   12. Housing 13.Other contingencies

These categories are divided into sub-components of expenditure, so we can find more specific information on each account. Since Irish expenditure does not contain the active labour market programmes, so Castles (2002) used the other twelve categories to determine the shape and direction of the welfare effort of twenty-one OECD countries from 1984 to 1997. We can find that some countries which share common historical and cultural experiences have the same pattern of social expenditure, so we can see 'families of nations' grouped into Scandinavian, English-speaking, Continental European and Southern European conglomerations (Castles, 2002; 622).

Castles suggested four categories, age-related expenditure, working-age expenditure, health expenditure and other service expenditure, based on data from 23 countries (Castles, 2008). He found that some countries had similar spending patterns to those of other countries. English-speaking countries showed low spending on age-related expenditure and a low level of total expenditure. Scandinavian countries were not big spenders on age-related expenditure but they tended to spend more on working-age expenditure than the other countries. Continental European countries spent more on both age-related expenditure and working-age expenditure. Southern European countries had a different pattern from other continental European countries since they spent more only on age-related expenditure and they spent less than the average in the other three categories. In brief, the point of his argument is that social expenditure can still be a useful indicator for finding the characteristics of a welfare state if we use disaggregated social expenditure.

He also examined the relationship between specific expenditure and distributive outcome using Pearson's correlation and found that the correlation was very high between income inequality measured by the Gini index and working-age expenditure. Working-age expenditure was also highly correlated with the poverty rate because age-related expenditure is more associated with horizontal life-cycle distribution and health expenditure is not aimed at changing income distribution directly.

As discussed above, one of the main disadvantages of using the social expenditure measurement is that it does not consider the demand side. The amount of social expenditure could increase when the number of beneficiaries increases, although the

benefit level decreases. Thus, the standardized social expenditure measurement considering the demand side of a welfare programme is proposed for this current study. As discussed above, social expenditure measurement is likely to neglect socio-economic and demographic changes (Clayton & Pontusson 1998) so those commentators argued that social expenditure, usually shown as % of GDP, has to be divided by the number of beneficiaries, such as the number of unemployed people or the number of people over 65 years of age. This method is also frequently used as it is simple and easy to compute, reflecting at the same time the quality of a welfare programme in terms of benefit level.

In brief, disaggregated data on social expenditure can be useful for finding how the structure of the welfare state institution is changing and developing, and standardised expenditure measurement can reflect demographic changes through a relatively simple method and data. Although there are many weaknesses in expenditure measurement, it is still considered to be the most-used measurement because of its ready availability. In addition, as we can see here, there have been many efforts to elaborate expenditure measurement for a better estimation. It seems that expenditure-based measurement will still be frequently used despite its disadvantages.

4.2.1.3. Aggregate social expenditure and distributive outcome

Expenditure measurement is frequently used as an indicator for the welfare effort of governments, so there have been many empirical studies which have examined this. The relationship between public expenditure in the broader sense and income inequality was reviewed in Chapter 3, so the focus of this section is on the relationship between social expenditure and income distribution.

In fact, the empirical studies on the relationship between welfare effort and distributive outcome have shown quite diverse results. Wilensky (1975) and Paukert (1973) both proposed that expanding a welfare state naturally has an equalising effect on the society, which can be summarised as the 'size hypothesis' (Palme, 2006: 338), which means that income distribution gets more equal as the country raises its welfare effort. In contrast, some researchers have argued that increases in the welfare effort are negatively related to distributive outcome. Neo-Marxists argue that a welfare state has two contradictory mechanisms regarding inequality. They insist that income inequality increases through the capital accumulation process but that social transfer programmes can be expanded at the same time to justify capital accumulation, so inequality rests on the balance of those

two mechanisms and income distribution does not necessarily improve when social expenditure increases (O'Connor, 1973).

Tanzi and Schuknecht (2000) compared income distribution by different levels of social expenditure in OECD countries. They divided OECD countries into three categories (small, medium-sized and large) based on the level of social expenditure between 1960 and 1990 and compared their income distribution using various indices. This showed that actually income distribution was better in small expenditure countries in 1960 since the Gini index of those countries was 0.324, whereas that of large expenditure countries was 0.337. However, this was reversed in 1990; the Gini of the small expenditure countries was 0.376 whereas that of the large expenditure countries was 0.321. This shows that countries which have higher social expenditure do better than countries which have less social expenditure in terms of income inequality. The findings are in line with the size hypothesis since they show that higher welfare state spending led to a decrease in income inequality.

Adema and Ladaique (2005) showed a way of elaborating the measure of welfare effort by considering the impact of tax and private spending on welfare so that they could estimate net spending on social welfare. The government can impose a tax on the social benefit (either a direct tax on benefit or an indirect tax on goods and services bought by recipients of benefit), or can just provide tax breaks for those receiving cash benefits. These different kinds of taxation have different impacts. Direct tax is related to clawing back income from the recipients, and indirect tax makes the households with larger income-related benefits pay more than those with a lower flat tax rate. They netted out all the tax effects to produce net public social expenditure, and then they added private expenditure for welfare and reached net social expenditure, which reflects welfare efforts better than social expenditure does. In fact, it shows quite different results, for example, the US ranked seventeenth in social expenditure in 2001 but went up to sixth in net social expenditure, and the ranking of Scandinavian countries tended to go down when considering net social expenditure.

They found that net spending is a better indicator which shows what the government is really devoting to social spending. However, Castles and Obinger (2005) showed a correlation between expenditure categories and redistribution outcomes among the OECD countries and the correlation between social expenditure and the poverty rate was

-0.82 whereas the correlation between net social expenditure and the poverty rate was -0.488. The correlation to the Gini index was also higher in social expenditure than in net social expenditure.

As explained above, social expenditure measurement shows how much a government is devoting to social welfare but it does not show the way in which the government spends the money or how it delivers a welfare service, which is quite relevant for determining the distributional outcome. Kaminada and Goudswaard (2001) argued that the qualitative structure of the institution is more important than social expenditure in income distribution. They investigated how income inequality can be attributed to changes in welfare states by focusing on OECD countries. They considered social security transfer as a percentage of GDP and used the gross replacement rates of unemployment benefit to measure the changes in welfare states. At first glance, the net social expenditure as a percentage of GDP had increased in all countries, and gross replacement rates had increased only in the UK and the Netherlands. An OLS regression showed that social security transfer was not significant in income inequality, but that gross replacement rates were negatively associated with income inequality. The results showed that the Gini coefficient decreased by 0.46 when the replacement rate increased by 1%. However, they used only regression with a single independent variable so a more elaborate approach is required for further study, as they admitted in their study.

As an example, they selected the case of the Netherlands to show the most detailed relationship between a welfare state and income inequality. They used the Theil index to measure income inequality. The Theil index has a value of zero in the case of absolute equality and a value of log (N) (N is the number of the population in the society) in the case of absolute inequality. The advantage of the Theil index is that it can be divided into sub-groups because it consists of average inequality within sub-groups plus inequality among those sub-groups. Thus, we can decompose the index. The result showed that the decrease in the social transfer programme explained the largest part of total inequality, about 39%. The next largest was the unequal distribution of primary income, which was mainly due to the increase in the labour force participation of women, at about 36%. Another factor was the lower progressivity of the tax system, which was about 29%. Their findings showed that changes in the welfare state partly explained the current situation of the inequality and in particular, the replacement rate is more significant than

the total social expenditure. In the case of the Netherlands, the most salient factor in the inequality was a decrease in social transfer. Consequently, they argued that we need to look into the more detailed design of the institution rather than social expenditure for research into income distribution and the welfare state.

4.2.1.4. Summary

In conclusion, it is suggested that social expenditure is a useful tool for measuring welfare effort since it is easily accessible and available on an annual basis. However, social expenditure does not consider the quality of the institution: it shows how much the government spends but does not show how the government spends it. Therefore, expenditure measurement does not fully reflect all the features of the welfare effort and even distorts information on it. Some researchers have therefore attempted to elaborate expenditure-based measurement. Disaggregated social expenditure can provide us with much more details on changes and the direction of welfare effort, and standardised social expenditure measurement reflects socio-economic and demographic changes so it can remove distortion of the total expenditure measurement by considering changes in welfare needs.

It seems, then, that expenditure-based measurement has weaknesses but is simple and easily accessible for research, and that it is also being elaborated by continuing studies so it is still relevant as a measurement of welfare effort. However, it could be dangerous and irrelevant if we focus on expenditure alone, although it can be elaborated in various ways. The next section will be a review of the social-rights-based approach, as an alternative to the expenditure-based approach.

4.2.2. The social-right-based approach

As explained in the previous section, expenditure-based measurement has been criticised for focusing on how much governments spend but not how they spend it. As mentioned above, measurement of welfare effort based on a social-rights-based approach is proposed as an alternative. The social-rights-based approach can be useful for measuring the quality of a welfare state and it can also help us to identify the structure of a welfare state and thus predict how welfare states will change in the future and compare the trajectory of the welfare reform of each country. This section therefore presents a review of the de-commodification index proposed by Esping-Andersen (1990) and the generosity

score which updates and elaborates the de-commodification index proposed by Scruggs (2013).

4.2.2.1. The de-commodification index

Esping-Andersen (1990) argued that previous methods did not show commitment to social citizenship and solidarity, so he proposed a de-commodification index. De-commodification can be defined as the degree to which an individual can maintain a reasonable living standard independent of market participation (Esping-Andersen, 1990: 37). He calculated a de-commodification index for eighteen developed countries using data for 1980. He focused on three programmes, pensions, sickness benefit and unemployment benefit. A policy which provides all people with a universal benefit was classified as highly de-commodified, whereas a policy which offers benefits based on contributions paid or current need was classified as low on the de-commodification index. He selected several variables to calculate the de-commodification index for each welfare programme. For a pension programme, earnings replacement rate, the number of years of contributions to qualify and the proportion of total pension finance paid by individuals were considered in the calculation, and for sickness and unemployment the procedure was not very different, although there were some exceptions. The proportion of individual financing was omitted and waiting days to receive the benefits and weeks of benefit duration were included in the calculation of a sickness and unemployment de-commodification index. In addition, every programme was weighted by take-up rate, which means the proportion of people who actually receive the benefit to the total number of people eligible for it.

The results showed that there was a distinction between the groups of countries. In general, the de-commodification index was lowest in English-speaking countries. Australia and the US scored 13.0 and 13.8 respectively, and the UK scored 23.4, which was relatively higher than other English-speaking countries but lower than Continental European countries and Scandinavian countries. Continental European countries such as Germany, France, and Italy occupied the middle group, ranging from 24.1 to 29.8. In addition, Scandinavian countries and some continental countries such as Belgium and the Netherlands showed a high level of de-commodification in welfare institutions, ranging from 31.1 to 39.1. For the de-commodification index of each programme, the pension

benefit was highly de-commodified for most of the countries and unemployment benefit had the lowest score across all the groups.

A de-commodification index shows the extent to which individuals' lives can be independent of the market system, so it shows the quality of the welfare state in terms of protecting vulnerable groups in the society. It is very distinct from social expenditure as social expenditure only reflects financial terms, concentrating on quantity rather than quality. These measurements are often referred as the social-rights-based approach as they consider welfare benefit as a right based on citizenship, so they are more concentrated about the quality of a welfare state in terms of how much individuals' lives can be protected from social risks.

However, it is not a perfect measurement of a welfare state. The de-commodification index does not cover every aspect of the welfare institution and focuses on particular cases, for example, the family policy area such as child benefit not being included in the index, so only some aspects of welfare institutions are reflected. It is also said that the de-commodification proposed by Esping-Andersen focuses on the protective dimension of welfare and neglects the productive dimension (Hudson & Kühner, 2010). The methodological issue is also addressed (Scruggs & Allan, 2006) since it employs standard deviation from the mean for calculation, so countries with slightly below or above one standard deviation have a different score. In spite of its critics, it is still very important for reviewing and analysing the de-commodification index as it triggered a massive amount of research on welfare institutions. The next index, proposed by Scruggs and Allan (2006), was also based on the de-commodification index and elaborated it.

4.2.2.2. The welfare generosity index

Scruggs and Allan (2006) emphasized the generosity of entitlement to determine the impact of welfare states on income distribution. As discussed in the previous section, many criticisms have been raised about expenditure measurement and many of them have argued that institutional factors should be taken into greater consideration for measuring welfare effort (Scruggs & Allan, 2006; Korpi, 1989; Esping-Andersen, 1990). It is therefore necessary to develop welfare measurement to capture the welfare institution in a way that reflects the level of welfare commitment in terms of entitlement and social right.

Scruggs and Allan also criticized the de-commodification index proposed by Esping-Andersen although they agreed with the basic idea which he proposed. The de-commodification index used standard deviation in the calculation, so those countries with just above or just below one standard deviation are considered to have very different scores even though they do not have much difference in the raw data. To correct this anomaly, Scruggs and Allan used a standardized Z-score to calculate a welfare generosity score. A Z-score estimates how far an original score lies from the mean in continuous scale, so we can avoid the problem of countries with similar scores having a different value when they are near the standard deviation and thus establish better accuracy and consistency of measurement.

They therefore proposed a new measurement of welfare effort based on social right. They considered unemployment insurance, sickness cash benefits and retirement pension as determinants of welfare generosity. In each programme, key characteristic components such as replacement rate, qualifying period, waiting days and duration of benefit were considered to calculate welfare generosity and were weighted by the coverage ratio. For each component, a generosity score was computed by using a Z-score calculated as follows. In each component (such as replacement rate or qualifying period), the benchmark year mean (they set 1980 as the benchmark year so that they could compare it with Esping-Andersen's de-commodification index which is also based on the year 1980) is subtracted and the result is divided by the standard deviation of the benchmark year. A Z-score normally has a zero mean and one standard deviation, and those scores are confined to a maximum of two in each direction, so its range is from -2 to 2. To make this score positive, two is added to the Z-score in order to produce the generosity score, which ranges from 0 to 4. As a result, we can produce a g-score for each specific programme such as unemployment, sickness and pension and produce a general g-score by adding those three scores together. They referred to this index as an indicator of 'programme generosity' (Scruggs & Allan, 2006: 10).

Scruggs and Allan produced this generosity score using data from 1971 to 2002. Based on the change in generosity score from the 1970s to the 2000s, they showed that welfare generosity had increased until 1980 and that standard deviation had declined, and that welfare generosity turned to decrease since 1980 although most developed countries showed a higher level of generosity in 2000 than in 1970, only German and Switzerland

showed decreases in welfare generosity (Scruggs & Allan, 2006). Now the most recent version of the data contains the generosity scores of developed countries until around 2011 (Scruggs, 2013).

Based on the generosity score, Scruggs and Allen (2008) insisted that the conventional idea of Esping-Andersen might not be the most appropriate typology, although they agreed with the basic idea of Esping-Andersen's typology. They selected criteria to reflect the main characteristic of each regime (conservative, liberal and social democracy) and measured the degree of each country in each characteristic. They found that each country changed its social welfare institution as time went by, so the welfare regime typology of the conventional idea does not fit into the current situation.

For example, Germany and Italy had a high score in the conservative group in the early 1980s but only a medium level score in 2002. Canada and Denmark had high scores in two dimensions (liberalist and socialist) and four countries (Belgium, Ireland, New Zealand and Norway) did not score high in any dimensions. They suggested that there had been some movement since the 1980s. In most countries, the individualization of risk and the target proportion of the social budget had increased, but at the same time, social programmes had a tendency to be more universal and benefits were closer to the flat rate. However, Van Kersbergen and Vis (2014) argued that Esping-Andersen's welfare typology still showed distinctive consequences in terms of poverty reduction and income inequality, so welfare typology should not be neglected despite all the drawbacks it has, and it still seems to need to be updated with recent data.

Wenzelburger (2013) argued that social-rights-based measures are preferable for a comparative analysis of welfare states. However, social-rights-based measures have a limitation as shown in the case of the de-commodification index. Generosity score is based on the de-commodification index; it therefore has the same problems as the de-commodification index, such as the exclusion of social programmes that do not replace income and the exclusion of long-term care. Consequently, the debate on the measurement of welfare effort has not ended yet.

4.2.2.3. Welfare generosity and its distributive outcome

Scruggs and Allan (2006) examined the relation between absolute poverty and the generosity of welfare states. They found that a reduction in poverty is closely related to

welfare generosity. They tested the relationship between absolute poverty and programme generosity, adding some control variables such as political partisanship, government spending, the level of GDP per capita, growth rate and market poverty (Scruggs & Allan, 2008). The results showed that sickness benefit score and pension benefit score were negatively related to income inequality and both of them were significant. On the other hand, the unemployment benefit score was not significant in poverty reduction. When the population was divided into working-age group and elderly group, the result was the same but the impact of both programmes (pension and sickness benefit) was bigger among the elderly group. As for other variables, the poverty rate reduced when market poverty was low with fewer veto points. The impact of the liberal regime and the socialist regime was not significant but this was because those regimes' variables were correlated with their generosity score.

Palme (2006) did not explicitly use generosity score but still employed the replacement rate or coverage rate of unemployment benefit, sickness fund and pension programme to measure welfare generosity. He found the different impact of each institution on income distribution. This showed that more generosity in the pension system was closely associated with an increase in poverty level in the working-age population. In contrast, more generosity in the sickness fund was related to a lower poverty rate. In addition, unemployment benefit generosity was not found to be significant in reducing the poverty level.

These studies have shown that welfare effort measured by generosity score has a significant effect on income distribution. As countries put more effort into a welfare state, they are likely to have less poverty and less inequality. This result is not much different from the results of those studies which employed expenditure-based measurement.

4.2.2.4. Summary

In brief, the welfare generosity score proposed by Scruggs and Allan was an elaboration of the de-commodification index to measure the welfare effort more rigorously. They used Z-scores to calculate the welfare generosity of unemployment benefit, sickness fund and pension programme. The welfare generosity index was similar to the de-commodification index proposed by Esping-Andersen, but it is more consistent and accurate, and it covers a longer period. They examined the impact of welfare generosity on income distribution and found that the generosity of sickness funds and pension

programmes is significantly related to a reduction in the absolute poverty rate in affluent countries. They tried to show not only the extent to which income distribution can be changed by welfare generosity, but also in what process each welfare institution influences income distribution. Thus, they suggested that we need more research on the linkage between the political process in determining the welfare institution and its distributive outcome.

Despite the many advantages of the social-rights-based approach, it still has shortcomings. It focuses on welfare programmes to replace income, so other programmes such as long-term care, housing and health-care are excluded. In addition, it does not consider changes in welfare needs. The social-rights-based approach is preferable to the expenditure-based approach but it does not take an absolute advantageous position over it. Therefore, the advantages and disadvantages of each approach have to be kept in mind when they are used in empirical studies which look at the relationship between income inequality and welfare effort.

4.3. Conclusion

This chapter has presented a review of the background logic behind how the welfare state was founded and has discussed the measurement of governments' welfare efforts. Various factors drive the establishment of a welfare state. Socio-economic development such as the development of a market economy leads to an extension of the market principal to all social areas, so labour is treated as a commodity and this requires government intervention for proper labour legislation. In addition, the prevalence of the market system leads to market failure in the social area, so it too requires government intervention. On the other hand, the welfare state reflects political struggles between different social classes. The social insurance system was introduced to maintain social order and maximize the use of the labour of the working class. Difference classes are exposed to different kinds of social risk, so the emergence and development of a welfare state are driven by political struggles and coalitions to maximize their own interests.

This chapter also reviewed measurements of welfare effort. It is well known that it is very difficult to measure welfare effort properly. There are two main approaches to measuring the effectiveness of a welfare state. The first is social expenditure-based measurement and the second is the social-rights-based approach. Social expenditure is one of most

commonly used measurements since those data are mostly available on an annual basis. However, it reflects only financial terms and does not capture the institutional aspect. Thus, it does not give us any information about the process by which society shares the risk amongst citizens. There have been some attempts to elaborate expenditure-based measurement, such as disaggregation and standardising. Expenditure-based measurement is still frequently used in empirical research because of its easy accessibility. Empirical studies have also shown that an increase in social expenditure has a significant effect on income distribution. On the other hand, social-rights-based measurement, such as the de-commodification index of Esping-Andersen or the generosity score of Scruggs and Allan, is very useful for reflecting the quality of a welfare state and identifying the structure of the welfare institution. However, it requires a great deal of information for computation so its accessibility is a bit less than the expenditure-based approach. However, due to the development of statistical techniques and data collecting, the generosity score has also been frequently used in many empirical studies, although it does not cover a social programme that does not relate to income replacement, so some important social programmes such as long-term care or education are excluded from the generosity score.

Debate on the measurement of the welfare state is important in this thesis as previous studies have shown that income inequality is closely related to the effort of the welfare state. Therefore, irrelevant measurement is likely to produce spurious results between the two. Each measurement has advantages and disadvantages which have been discussed in this chapter, so the debate is still under way.

Chapter 5. Welfare state regime: Difference in the institutional design of welfare state.

5.1. Introduction

The previous chapter presented a review of different kinds of measurement of social policy development. The expenditure-based approach has been one of most frequently used measurements, but it has been criticised because it does not reflect the quality of a welfare state. The social-rights-based approach, which was used as an alternative, focuses more on the quality of a welfare state and how the government spends the allocated expenditure. 'How' is closely related to the institutional design of a welfare state as an institution which is a combination of different welfare programmes, so the institutional design of a welfare state reflects process and criteria on how the government spends social expenditure.

The institutional design of a welfare state is different according to the historical and political context. Each country has a different social structure, labour market behaviour and network between interest groups and these differences influence the trajectories of development in the welfare state. This consequently results in the variety of institutional designs of a welfare state. Detailed explanations of the process of how the development of welfare states takes different paths are beyond the scope of this chapter, so this section concentrates on how to classify the institutional designs of welfare states. Although each country has its own design of its welfare state, countries which share a similar historical and political background are likely to have a similar structure of their welfare states. This section presents a review and discussion about how to classify the policy structure of a welfare state, as there are several different ways to classify it.

5.2. Three worlds of welfare state: the welfare regime proposed by Esping-Andersen

5.2.1. Theoretical background to welfare regime

As discussed in Chapter 4, one of main background logics behind a welfare state is class mobilisation theory (Esping-Andersen, 1990; Korpi, 2006). The development of a welfare state is closely related to a power struggle between different social classes about the

extension of the scope of social citizenship. Thus the characteristics of a welfare institution cannot be understood or measured without a profound understanding of the historical process of how to build a welfare state and the political interaction between salient actors.

In fact, some studies have attempted to understand the welfare state as a political power struggle between various social groups. T.H. Marshall (1950) insisted that social citizenship constitutes the core concept of a welfare state; social citizenship is granted on a universal basis rather than on performance. In the period of pre-capitalism, workers' lives were not dependent on the sale of their labour since family, church and the feudal system helped them to sustain their quality of life. However, as the market economy developed, more workers could sell their labour in the market so their lives became more dependent on the market economy, which meant that their lives were more commodified. This commodification led to more severe competition between workers and the price of labour dropped as the competition became fiercer. Commodification was inevitable for the development of capitalism but it was not sustainable (Polanyi, 1944) as it can be easily destroyed by illness, accidents or unemployment due to the economic cycle. Thus, social citizenship was introduced to protect workers' lives and to enable them to sustain a decent quality of life. As the modern concept of social citizenship was introduced, it was accompanied by a de-commodification, which meant that workers' lives became less dependent on the market economy. De-commodification could protect workers who provided the labour force from unexpected events, and various types of welfare institution were established according to how a society dealt with the de-commodification. Therefore, the design and effort behind the establishment of a welfare institution should be understood as being based on de-commodification, social citizenship and historical context.

5.2.2. How do countries develop welfare state in different ways?

Countries which share historical and cultural characteristics have developed welfare institutions in similar ways. Esping-Andersen considered the struggle between social classes and the social stratification system to be the determinants of a welfare regime (Esping-Andersen, 1990). Continental European countries such as France and Germany were based on feudal paternalism and clientelism, so the role of their governments emphasized the protection of their people from poverty and maintaining the quality of

life. Those countries also had strong and centralized governments so they had sufficient bureaucratic power and organization to establish a welfare state. However, the goal of social policy in those countries was more concentrated on sustaining social stability and order by making people comply with the government's wishes. They also had a strong tradition of emphasizing the role of family and church in taking care of the weak in the society. Thus, the difference between social classes was still important, so social insurance systems based on occupational group and contribution developed in those countries. In pre-capitalist society, occupational groups of artisans and craftsmen which had monopolized entry and membership took care of the disabled, widows and orphans in their groups. Social insurance based on occupational groups actually maintains the difference between different groups, rather than supporting the weaker in the society as a whole.

In contrast, the countries that had liberal governments took a different approach to welfare institutions. Their liberalism assumed that the market was emancipatory in nature and that each individual could enjoy full employment unless the market was interfered with by the government or central power. In addition, liberalism also valued individuals' freedom of choice not being disturbed by the government or other actors. Thus, individuals could secure their own welfare if the market worked well, so poverty and inequality were not the fault of the market system but the responsibility of individuals who neglected to prepare for their own future.

The welfare states in the liberal world were based on the concept of the residual welfare state proposed by Titmuss (1974). That concept meant that a welfare institution was only required when the market explicitly failed. Consequently, those countries preferred means-tested assistance rather than a universal approach or social insurance. The government was responsible for identifying the individuals or households in need of help and for providing appropriate assistance in a way which would not induce them to choose welfare instead of work. On the other hand, liberal countries did not object to charity or insurance as such. What mattered was that charity or insurance should be free from the central authority and based on volunteerism and free contract. Consequently, the private insurance market was more preferred and well developed in liberal countries. Anglo-Saxon countries such as Australia, the US and Canada, and early Scandinavian countries, are considered as having a liberalist tradition in designing their welfare institutions.

The early Scandinavian countries had similar characteristics to Anglo-Saxon countries but had taken a different step in building their social policy institutions. Those countries were based on socialism, which strongly objected to the commodification of labour. Those countries also had well-organized agricultural communities, so they had a better capacity to negotiate with the government. However, they preferred gradual changes rather than revolutionary reform so they gradually extended the scope and quality of social rights. The labour parties in those countries therefore supported class-exclusive schemes so universal coverage was inevitably pursued. At first they avoided social insurance based on occupational group and took a universal approach but a modest benefit level, and they also introduced private insurance to compensate for the lack of benefit from public insurance. Thus, the initial welfare institutions of those countries looked similar to those in Anglo-Saxon countries until the 1950s and 1960s. As time went by, their systems became more concentrated on strengthening public insurance, not like the Anglo-Saxon countries. They extended the scope of absolute need so more people could be covered and they upgraded benefits to sustain a decent average living standard. In brief, the base of the socialist paradigm in the welfare state was "the emancipation from the market dependency" (Esping-Andersen, 1990: 47).

Consequently, we can find that each country group had a different method and ideology to respond to the commodification of labour and the development of capitalism, and they established different welfare state institutions. The conservative model, represented by Continental European countries, valued the role of family, authority (church) or groups which shared the same characteristics for each individual's market independence in maintaining the quality of life, whereas the liberal model emphasized maximizing freedom and the responsibility of the individual, so they preferred to minimize the role of the government and sought to provide means-tested social assistance rather than a universal approach. The socialist model wanted to facilitate the de-proletarianization of workers and to extend social rights, so their welfare institutions were more focused on extending entitlement and maintaining the quality of life regardless of labour participation. We can see that each country had its own way to establish a welfare state based on its cultural and political characteristics.

On the other hand, differences between welfare states can be explained by how strongly the middle class cooperated with the working class to support the welfare state (Van

Kersenbergen & Vis 2014). If the middle class did not get any benefit from the welfare programme, the result was likely to be a liberal regime, whereas it was likely to be a social democratic regime when the middle class was entitled to benefits. But then, how is the inclusion of the middle class determined?

Iversen and Soskice (2006) proposed another explanation. They argued that the party system plays an important role. After the Second World War, most of the developed countries had either a two-party system or a multi-party system. Under a two-party system with majoritarianism, the government taxes both the upper and middle classes and provides benefits to the poor only when the left party is in power but the government will not tax the upper and the middle classes if the right is in power. So under the two-party system, the middle class will be either taxed or not, but cannot get benefits in either case. Consequently, the middle class is likely to vote for the party of the right under the two-party system, so countries with a two-party system tend to have a less generous welfare state. In contrast, the middle class has a different choice under the multi-party system with proportional representation. The middle class and the party of the left can form a coalition and tax the rich only and the middle class has access to welfare benefits. Consequently, countries with a multi-party system are likely to have a more generous welfare state.

This explanation proposed by Iversen and Soskice (2006) fits well with the difference between a liberal welfare state and the Scandinavian welfare state. However, it has been criticised for failing to explain the difference between the Scandinavian welfare state and a conservative welfare state, which is generous but differs profoundly from the Scandinavian model. Van Kersenbergen and Vis (2014) explained the difference between the Scandinavian welfare state and a conservative welfare state by the differences in political representation between their welfare states. For Scandinavian countries, there were not many conflicts between church and government so churches were not threatened by the welfare state which took over the role that the churches used to have. Instead, there were conflicts of agrarian and industrial interest, so in the development of the welfare state and the importance of a workers-farmers (red-green) coalition was emphasized. In contrast, the political space of the agrarian party in Scandinavian countries is taken by Christian democratic parties in conservative countries. Parties with religious interests played a significant role in the development of welfare states in

conservative countries and this is what made the difference between a social democratic welfare state and a conservative welfare state.

The discussion of the three regimes presented by Esping-Andersen is relevant because subsequent studies on distinguishing the institutional designs of welfare states were mostly based on this typology.

5.2.3. De-commodification index and welfare typology

As was shown in the previous section, Esping-Andersen argued that welfare states can be divided into three types, liberal, conservative and social democratic. De-commodification is one of the main characteristics that affect the institution of the welfare state, so the de-commodification index which was introduced in Chapter 4 can be an empirical indicator to show the difference between regimes. De-commodification index is frequently used as indicator of welfare regime in the empirical studies on distributive outcome of welfare

A liberal welfare state normally indicates countries with a low de-commodification index, which means that the replacement rates of benefit are relatively low, the individual share of benefit financing is high and private pensions and private expenditure are prevalent. In other words, those countries are more generous in terms of individual freedom and duty, rather than government having the responsibility to maintain the individual's quality of life. Australia, the US, the UK, New Zealand, Canada and the Republic of Ireland can be included in this model. These so-called Anglo-Saxon countries have a similar institutional tradition regarding their welfare states. The second model is the conservative model, which occurs in continental European countries such as Italy, France, Germany and Switzerland. The conservative model has contributory and earnings-related characteristics and a strong legacy of corporatism and Catholic social policy, so the role of the government is limited whereas the role of the occupational groups is more emphasised in income maintenance benefit. The third model is found in social democratic countries such as the Scandinavian countries, Sweden, Denmark and Norway. They have a high de-commodification index so their system has a universal benefit and a high degree of equality. Clearly, redistribution is the major goal of policy in the social democratic countries (Castles & Mitchell, 1992). In the following section, studies of how a different regime makes a difference in performance in terms of income inequality will be reviewed.

5.2.4. Distributive outcome and welfare regimes

As mentioned above, the institutional design of a welfare state is expected to make a difference in income distribution. Theoretically, the social democratic regime is based on the universal system so it provides benefit to all regardless of their income, so it does not seem to reduce income inequality. In addition, it is reported that educated people have more capacity to take advantage of universal services such as health-care and education. It is so-called 'Matthew effect' which argues that only the rich can take advantage of a universal social programme (Merton, 1968; Rigney, 2010). Moreover, conservative regimes mostly have occupational and earnings-related social insurance and these systems intentionally reproduce social inequality and status differentials in the welfare state. Thus, it seems that social democratic and conservative countries are not effective at reducing income inequality.

In contrast, a targeting system provides benefits exclusively to the poor who are in need of it. At first glance, targeting looks efficient because it does not provide benefit to people who do not need it. It also looks more effective at reducing income inequality as only the poor can have more income from the welfare programme whereas the rich pay tax but do not get any benefit. The so-called 'Robin Hood tax' which takes money from the rich and gives it to poor is one example of the targeting system. In other words, targeting not only looks more efficient financially but is also quite useful for reducing income inequality. Tullock (1983) argued that targeting is better for the poor as the benefit is concentrated on them, whereas the benefit is spread across different income classes under a universal system. In addition, Matthew effect mentioned above also provides a rationale for having a targeting system. Some studies have argued that the rich can get benefits from universal education or child-care as they have access to more information and can get more service from them (Cantillon 2010; Vandenbrouke & Vleminckx 2011).

A simple egalitarian system with a flat-rate benefit for all, which is known as the Beveridge system, is often proposed as an alternative to targeting. It is a universal system but it is different from the social democratic system, as the benefit is not related to previous income. In fact, under the Beveridge system, the poor get relatively more benefit than the better off, in spite of flat-rate system. In this sense, the Beveridge system can be expected to reduce income inequality as effectively as targeting can because both of them offer more benefit to the poor rather than the better off. Under the universal

flat-rate system, the absolute amount of benefit is the same for the poor and the rich but the relative size of the benefit would be larger for the poor, so the income gap between the poor and the better-off can be expected to decrease. Based on this discussion, a liberal welfare state should have less income inequality than a social democratic or a conservative welfare state.

However, most empirical studies have shown that social democratic countries have less inequality than liberal welfare states. Van Kersbergen and Vis (2014) calculated the mean value of the Gini coefficient (which indicates 0 when there is no inequality and 1 when there is extreme inequality in a society) of each regime from 1970 to 2000. They found that the mean value of the Gini coefficient increased over this period but was still higher in the liberal welfare states (0.30 in the 1970s and 0.34 in the mid-2000s) and was lowest in the social democratic welfare states (0.22 in the 1970s and 0.25 in the mid-2000s). Conservative welfare states were positioned between the other two regimes. Data from OECD social expenditure (SOCX) showed the same results, since the Gini coefficient in the social democratic welfare states was 0.264 in 2010, 0.337 in the liberal democratic welfare states and 0.308 in the conservative welfare states (OECD, 2013). Castles (2008) also showed that social democratic countries with a high de-commodification index have an equal income distribution with liberal democratic countries. Many studies have shown that a welfare regime has a different effect on poverty and inequality, and they seem to have reached the same conclusion that a social democratic welfare state has less income inequality as well as less poverty than a liberal welfare state (Kenworthy 1999; Korpi & Palme 2003; Scruggs & Allan 2006). This is often called the 'paradox of redistribution', which says that "The more we target benefits at the poor only and the more concerned we are with creating equality via equal public transfers to all, the less likely we are to reduce poverty and equality" (Korpi & Palme 1999: 681-682).

On the one hand, this seems to be a quite natural result as countries which have highly de-commodified institutions provide protection regardless of the individual's economic performance in the market so people's lives can be more independent of the market. This makes the distributive outcome more equal than in countries with a less de-commodified institution. However, an increasing number of previous studies have argued that the important thing is whether or not this includes a better welfare benefit. As mentioned above, the universal system provides benefit to all regardless of their income and the

targeting system provides benefit only to the poor, so the income of the poor can increase. However, the targeting system excludes the better-off from welfare benefit so they are likely to join private insurance schemes which offer higher benefits. Consequently, the income gap between the poor and the better-off increases in a targeting system. It is same in the universal flat-rate system as well, since the better-off have an incentive to join private insurance schemes. On the other hand, the better-off do not have an incentive to join a private insurance scheme under the universal system with earnings-related benefits, so the income gap between the poor and the better-off is still maintained at a reasonable level, although this system might reproduce the income gap in the labour market. Korpi and Palme (1998) argued that the better-off citizens help not only themselves but also the low-income group within the encompassing institution.

The inclusion of the better-off citizens in the welfare state seems to play an important role in determining the distributive outcome of the welfare state. The following section will therefore offer a discussion of welfare typology and focus primarily on the issues of targeting, means-testing and universal eligibility.

5.3. Five models based on the Targeting and universalism

Korpi and Palme (1998) wanted to see welfare state institutions from a different perspective compared with Esping-Andersen's de-commodification index. Esping-Andersen's model mainly concentrated on the political struggles among states, families, and the market in the historical and political context in the determination of welfare institutions. Korpi and Palme, however, focused not only on the factors affecting welfare institutions but also on the outcome of the welfare states. Institutional structure is affected by the conflicts among the interest groups, which then affects the outcome (Korpi & Palme, 1998). They therefore focused on two factors which are believed to be salient factors in determining the distributive outcome.

The first factor which they focused on was benefit entitlement and whether it should be means-tested or have universal coverage, and the second was benefit level and whether a flat rate or earnings-related benefits is more effective. As shown in the previous section, some studies have argued that a means-tested system is more efficient at reducing poverty and inequality (Tullock, 1983), but most empirical studies have shown opposite results. Also, some researchers have argued that a flat-rate benefit is more efficient at

reducing poverty and inequality (Castles & Mitchell 1992) but others (such as Palme 1990) argued that a universal earnings-related pension system shows better distributive outcome in the old-age population than a flat-rate system because an earnings-related pension actually crowds out the private pension, and that leads to less inequality.

Based on those debates, Korpi and Palme (1998) attempted to classify the institutional design of welfare state. They did not elaborate the de-commodification index nor propose more improved quantitative measurements, but they suggested a different welfare state typology combining various levels of benefit entitlement and benefit level. They also attempted to examine the effect of the institutional design of a welfare state on income distribution.

5.3.1. Five models based on benefit entitlement and benefit level.

As a basis of the model, they considered two major social insurance programmes, old-age pension and sickness cash programmes, because those two programmes are most effective at supporting citizens' needs, so they are considered a key part of any welfare state (Korpi & Palme, 1998). They then focused on three main aspects of each programme. The first aspect was the basis of entitlement which indicates whether eligibility is based on means-testing, on contributions, on belonging to a specific occupational group, or on citizenship. The second aspect was the principle of benefit level, whether the benefit level is a means-tested minimum, a flat rate or a different benefit related to previous earnings. The third aspect was called "forms for governing a social insurance programme" (*ibid.:* 667), which means that programme governance is based on the cooperation between employer and employee. Based on those criteria, they placed those countries that had similar welfare systems together into one category based on entitlement, benefit level and the type of governance in social insurance.

Consequently, they established five categories: the targeted model, the voluntary state-subsidized model, the corporatist model, the basic security model and the encompassing model. In brief, the targeted model is a social insurance system based on a means test and minimum or smaller benefits focused on the poor. The voluntary state-subsidised model uses other voluntary organizations to provide their members with insurance to protect them against loss of income. Eligibility is based on membership and voluntary

contributions, so it is more important for skilled workers or the middle class, rather than the poor. In this model, the flat-rate benefit is more prevalent.

In the corporatist model, the social insurance system creates socio-political communities. The different segments of the labour force form their own groups, and the employees and employers have strong co-operation within the groups. Eligibility is based on occupational membership and contributions, and the benefit is certainly based on an earnings-related system, but the benefit level varies according to the occupational group to which the workers belong. It starts with the industrial working class but gradually new occupational groups are added. However, the occupational groups are for the economically active population, so housewives and outsiders of the labour market are excluded from the system. The key difference between the corporatist model and the other four models is that the socio-political community is governed by cooperation between employer and employee, and the programme is funded by contributions from both employees and employers.

The basic security model, which is closest to the Beveridge model (1942), is based on the universality of eligibility, so benefit entitlement is based on citizenship but contributions are required. Unlike in the corporatist model, people who contribute to the programme belong to the same insurance programme. The benefit level can vary but usually has a small variance, so it is more like the flat-rate system. The encompassing model is based on a combination of ideas from the Bismarck and Beveridge models. Eligibility is based on citizenship and contributions, and the programme provides recipients with basic security and earnings-related benefits. This model is likely to crowd out the private insurance market and has the potential to cover the whole population.

5.3.2. Main characteristics of each model

Social insurance is a risk-pooling system in which members can share risks and resources, so the different structures of institutions depend on differences in risk and resources by increasing homogeneity in each type. Thus, the welfare institution is related to a coalition between poor citizens and better-off citizens, and between the working class and the middle class. The corporatist model and the voluntary state-subsidized model both lead to strong segmentation of the labour force since they are based on occupational group. The occupational or specific industrial group members are likely to share homogeneous

risks, contributions and benefits. Thus, the differences between occupational categories remain and are institutionalized in those models, so coalition between different classes is usually discouraged.

The targeted model is based on the Robin Hood principle of taking from the rich and giving to the poor. Consequently, there would be more tension and conflict between the poor who receive the benefits and the middle class who pay for the poor without any benefit for themselves. This brings about a negative attitude in the middle class towards the welfare institution because the middle class is likely to object to the welfare state politically. The basic security model intends to provide a flat-rate benefit based on universal citizenship. This means that every citizen who contributes to social insurance belongs to the same benefit level. However, the rich are allowed to have private insurance as well, so the separation between the middle class and the poor is still significant in the basic security model.

In contrast, the encompassing model includes all citizens and all citizens belong to the same programme, which has earnings-related benefits. The encompassing model tends to encourage coalition between the working class and the middle class since they are in the same programme. In addition, the earnings-related nature of benefits is useful for reducing the demand for private insurance since the middle class has no reason to abandon public insurance. In the encompassing model, the middle class tries to help the poor, as well as themselves (Hirschman 1970, cited in Korpi & Palme 1998)

5.3.3. Distributive outcome of each model

Korpi and Palme (1998) examined the poverty rate and inequality index in each group using data from eighteen countries in 1985. They found that no country fell into the voluntary state-subsidized group. Finland, Norway and Sweden were classified as having an encompassing model; France and Germany were included in the corporatist model category. Most of the Anglo-Saxon countries (the UK, the US and Canada) and some continental European countries (the Netherlands and Switzerland) were included in the basic security model. Australia was the only country classified as having a targeted model. The results show that income inequality in the working age group (25-59) was high in the targeted model countries, and the encompassing model group had the lowest level of inequality, followed by the corporatist and basic security models. Countries in the same

group had a tendency to have similar values, but there were some differences in the basic security model. The Gini index was 0.254 in the Netherlands, which was similar to that in the corporatist countries, but in the US it was 0.327, which was the highest level of inequality in their sample.

The poverty rate also showed similar results. The poverty rate was higher in the basic security and targeted models but relatively low in the encompassing model, and the corporatist model was at medium level. However, like income inequality, the poverty rate was quite diverse within the basic security model; the Netherlands was similar to the encompassing model countries, but the US had the highest poverty level in its sample.

Regarding the old-age population (from age 60), we can expect that income inequality is lower in the basic security model since the countries in this model have a flat-rate benefit whereas the encompassing model and the corporatist model have earning-relatedness in their pension systems (Mitchell, Harding & Gruen, 1994), but empirical observation has shown different results. Amongst those countries' 1985 data, income inequality in the old-age population was highest in the US, followed by Australia and Canada. The countries in the encompassing mode, such as Finland and Sweden, had the lowest level of income inequality in the old-age population. In other words, the countries with a flat-rate benefit actually had higher levels of income inequality than countries with earnings-related benefits. The Gini coefficient from OECD data (SOCX) still showed that income inequality among the elderly was high in the US, Australia and Canada and low in the Scandinavian countries in 2010. According to Korpi and Palme's (1988) classification, the basic security and targeted models have a flat-rate system, so the rich and the middle class are likely to have private insurance, and income inequality gets bigger as private insurance becomes more prevalent.

In addition, this shows that the redistribution effect gets higher as the social insurance programme is less targeted on the poor. The index of the targeting of transfer income which has a negative value when the income transfer is low-income targeting and a positive value when the income transfer includes the high earners is positively correlated with the size of income redistribution measured by decreases in the Gini coefficient from market income to disposable income expressed as a percentage of the Gini coefficient of market income. This means that income redistribution is actually relatively small in the countries with high levels of targeting such as Australia and Canada. Consequently,

studies have shown that countries with universal entitlement and an earnings-related benefit system shows better form in income distribution than countries with targeted entitlement and a flat-rate benefit system (Korpi & Palme, 1998). This is notable result since it is the opposite of many scholars' expectation, since many scholars have insisted that a flat-rate benefit is more useful for reducing inequality (Castles & Mitchell, 1992) and a targeted system has more equalizing power than the universal approach (Barry, 1990; Marshall, 1950).

However, those studies do not show the rigorous relationship between welfare policy and income inequality because they reached their conclusions by simply comparing the poverty rates and income inequality across the countries according to the welfare state model, and did not consider the impact of other economic or political variables. Even so, their findings do shed light on how the welfare institution changes the distributive outcome in a very detailed way.

Subsequently, some studies have examined the impact of welfare institution proposed by Korpi and Palme using more rigorous quantitative research methods. Palme conducted more developed research in 2006, based on his previous study of 1998 (Palme, 2006). He discussed previous studies on the relation between welfare states' policies, poverty and inequality and emphasized that institutional difference between welfare states is very important in accounting for the diversity of poverty and inequality which exists across the developed countries. However, it is very difficult to make a clear classification in the real world since countries adopt mixed welfare states policies. Moreover, one country can fall into a different welfare state model according to the different policy areas. We therefore need to focus on a specific policy area and its targeted group when we need to know the relationship between welfare states' different regimes and income distribution.

Palme (2006) took some case studies to prove that the design of welfare state institutions matters in income distribution by using pooled time series, cross-sectional regression. One of his cases examined the relationship between unemployment insurance and poverty among the working aged. Welfare state regimes are divided into three categories according to his previous study of 1998; the basic/targeted, state corporatist and encompassing models. He established two regression models, the first considered structural variables (unemployment rate, the rate of the single earner, female labour participation rate) and the welfare regime, and the other considered institutional

variables (net replacement rate, coverage rate and maximum duration) and the welfare regime. As a result, institutional variables explained a larger part (about 68%) of the variation in poverty reduction than structural variables (46%), and the encompassing and corporatist models did not show any large difference but the basic/targeted model was distinct from the other models. The results showed that the basic/targeted model increased the poverty rate by 4.1% more than the encompassing model. In addition, it was also shown that retrenchment in the net replacement rate was associated with an increase in the poverty rate.

Another case study was the pension system and poverty among the elderly. The pension system was classified into a basic security model and an income security model. The basic security model included a citizenship pension (a pension without any needs testing or previous income requirement), a minimum pension (basic benefit plus means-tested components) and a worker's minimum pension (requiring completion of a minimum number of years of contribution), and the income security model was the worker's pension model which offered benefits to workers on the basis of specific numbers of years of contribution and of average earnings. The results showed that all types of pension were related to a decrease in poverty among the elderly, but only the citizenship pension and the worker's minimum pension were significant. This finding indicates that a pension based on citizenship is more important in reducing the poverty rate among the elderly. It also shows that aggregated pension expenditure is not significant, which indicates that the aggregated model does not capture the impact of each component.

To summarise, then, this current study makes two points. The first is that the institutional design of a social protection programme is very important in terms of the distributive outcome. The second is that we need to separate the policies according to their main objectives because each policy has its own goal and target and each country can fall into a different welfare regime according to the specific policy area.

In brief, the model proposed by Korpi and Palme shows how the mixture in a welfare institution affects the distributive outcome. They focused on two factors, benefit entitlement and benefit level, and established five models based on the mixture in each institution. Although they did not elaborate on quantitative measurements for welfare states, they did provide a more sophisticated welfare typology so that we can see the difference in distributive outcome in different welfare institutions. Empirical studies have

shown that those mixtures of welfare institution have a significant impact on the distributive outcome. Contrary to other scholars' expectations, the results showed that an earnings-related benefit system with universal eligibility is related to a low level of income inequality and poverty rate. In fact, this result is in line with the 'paradox of redistribution' which was described in a previous section.

5.4. Conclusion

This chapter has presented a review of previous research studies on the welfare state and income distribution. The welfare state is the effort of a government to protect the most vulnerable groups in its society. Welfare states all have a similar role but the development of a welfare state differs across countries according to their political and social context. Thus, the welfare state has different institutional structures. There are various ways to identify the institutional design of a welfare state. Esping-Andersen regarded a welfare institution as an instrument by which each country responds to the de-commodification of labour which arose from the development of capitalism. The de-commodification of labour was a universal phenomenon so each country had to establish a different welfare institution to deal with it based on its own history of social stratification. Those countries which shared a similar history and social structure were likely to have a similar welfare system. Consequently, Esping-Andersen suggested three categories of welfare institution, social democratic, conservative and liberal democratic welfare states.

Empirical studies have shown that income inequality and the poverty rate are significantly different in different welfare regimes; a social democratic welfare state has a relatively low level of poverty and income inequality whereas a liberal democratic welfare state has a higher level of poverty and income inequality. It can be inferred that the institutional design of a welfare state has a significant effect on income distribution. The point of this result is that liberal democratic states, mainly focused on a targeting system, have higher income inequality, and this is called the paradox of redistribution. Korpi and Palme proposed five categories of welfare institution focusing on the degree of universalism and targeting and found that income distribution looks better under a universalist system.

In brief, this chapter has presented a review of the various institutions of the welfare state as determinants of income inequality. Previous studies have shown that the level of welfare effort has a significant effect on income inequality and how governments spend is

important for income inequality. In other words, not only the quantity of a welfare state but also its policy structure are very important in determining income inequality. This chapter has concentrated on the conventional discussion of the welfare state. Welfare states now face economic and sociological changes so their reformation is an emerging issue. Therefore, the following chapter will focus on changes in the environment that a welfare state faces, and how it affects the structure of the welfare state and income distribution.

Chapter 6. Reform of the welfare state and its distributive outcome

6.1. Introduction

The previous chapter offered a review of the role of the welfare state as a determinant of income distribution. It was shown that the welfare state has a significant effect on changes in income inequality. However, the focus of the previous chapter was on the conventional welfare state which is established on the basis of the male-breadwinner household in an industrial society. Many recent studies have pointed out that welfare states have undergone substantial changes since the 1990s (Bonoli, 2013). Sociological changes such as an aging population or household formation have put financial pressure on the welfare state and produced a new type of vulnerable social group. At the same time, the industrial structure is changing rapidly so the type of unemployment is also changing. These changes affect income inequality directly and require reform of the welfare state.

Chevan and Stokes (2000) stated that industrial restructuring and population composition drive income inequality in the US. Industrial restructuring, so-called "deindustrialization" (Bluestone & Harrison, 1982), means the shift of employment from manufacturing to services because of technical developments and it had exacerbated income inequality in America, as income inequality in the service area is larger than that in the manufacturing area. This argument is in line with the argument of Kuznets and other economists who insisted that income inequality is mainly driven by changes in the labour market which are caused by technological development. The change in population composition also affects income inequality: Chevan and Stokes (2000) gave the participation of the female labour force, the increase in female-headed families, the proportion of minority groups, educational attainment and age as determinants of income inequality.

The aging population is also reported to bring significant changes to income distribution. Previous studies have pointed out that most developed countries experience increases in life expectancy combined with a low fertility rate. As the population gets older, economic productivity becomes lower and social expenditure regarding old-age care increases (OECD, 1996). At the same time, the future generation is expected to take on an increased burden to take care of the elderly in the society due to the low fertility rate. In

particular, pension costs form a large proportion of social spend and an aging population increases pension costs, so the government comes under pressure from a budget deficit.

The welfare state attempts to introduce new policy instruments to deal with these changes, although the functions of the traditional welfare state also remain important. For instance, reform of the public pension programme has been attempted across developed countries and an active labour market policy is emerging as an alternative to the traditional welfare programme. It is difficult to define the trend of these new policy instruments, but the policies tend to be more active, productive and preventive. Traditional welfare programmes are more focused on a protective system, so this change is also expected to affect income distribution.

Therefore, this chapter will present a review of the sociological and economic challenges to the current welfare state and consider how a welfare state deals with those challenges with new policy instruments. In particular, the focus of this chapter is on the aging population and pension reform, changes in an industrial structure and the introduction of an active labour market policy, and these are often regarded as important challenges for a welfare state. At the same time, this chapter will also review empirical studies of the distributive outcome of new policy instruments and reform programmes.

6.2. Ageing and income inequality

6.2.1. Ageing population

Populations in OECD countries are aging quite quickly because of increases in life expectancy and low fertility rates (Esping-Andersen, 2009) in the most developed world, but the pace of aging can vary. The size of the increase is quite large in southern European countries such as Portugal, Italy and Greece. Nordic countries, except Finland, show only modest increases compared with other countries. Life expectancy is increasing and fertility rates are still very low in most developed countries, so it has been reported that the proportion of the population aged over 60 is expected to reach 32% by 2050, from 12% in 1950 and 23% in 2013 (UN World Population Aging, 2013). Most of the European countries have been getting older and older during the twentieth century and it is expected that more than a quarter of the EU population is going be aged more than 65 years in around 2040 (Esping-Andersen, 2009). In particular, the proportion of the ultra-

aged (over 80) doubles every twenty years and is expected to reach around 10% in the middle of this century (Esping-Andersen, 2009).

An aging population affects society in various ways. The aging population is related to the decrease in labour supply due to the fall in the proportion of the younger population. Changes in labour supply lead to lower economic growth as the relative increase in dependent persons is higher than the increase of workers (Prskawetz *et al.*, 2007; Harper, 2014). The OECD (2012) estimated that the proportion of working-age people in most countries is going to decline over the next half century by 9% on average and this will have a potentially negative effect on economic growth.

Aging is also closely related to income distribution and the welfare institution. Most people retire at around 60 years old and they depend on a pension during the rest of their life, which means they have less income than the economically active group. Thus, income inequality between the generations and poverty among the elderly can be a social issue. In addition, aging leads to a new type of inequality. Life expectancy is likely to be longer for individuals with high education and a professional job, and their average income is higher than the average. Thus, individuals with low education and a manual job are more likely to fall into the poverty trap after retirement and have relatively short life expectancy (Meara, Richards & Cutler, 2008)

Educational homogamy is something that will increase inequality among the elderly since a well-educated couple's marriage is more stable and their family is likely to have more income and less risk of unemployment (Blossfeld &Buchholz, 2009). A less educated couple is more unstable, so divorce and lone mothers are more common among less educated couples. Consequently, less educated couples are likely to have fewer savings and to fall into poverty. As a result, inequality between the rich and the poor increases since the rich can enjoy a longer life after retirement with an ample pension and savings, whereas the poor suffer from poverty after retirement and die earlier. US studies have shown that income among top quintile retirees is higher than the income of bottom quintile retirees by eight times (Butrica, Iams & Smith, 2003).

An increase in the elderly who depend on a pension is inevitably related to an increase in welfare expenditure. Thus, countries with a high elderly population are likely to have trouble maintaining a decent level in the pension system. The low fertility rate in most developed countries means that there are fewer people to work and to finance current

government expenditure but more people who need support from the government. Consequently, revenue decreases and expense increases, so the government can easily get into financial trouble. The government needs to cut the pension benefit but this is not easy because the elderly have strong voting power. As the proportion of the elderly increases, pension generosity is unlikely to reduce. Politicians, who want to maximize their votes, are more sensitive to the requirements of the elderly than to the young generation. Thus, politicians try to maintain the generosity of the pension system to get votes from the elderly and this leads to cuts in the benefit of other social protection systems, such as unemployment insurance or child benefit. Consequently, a generous pension system can be related to poverty in the young generation, so it can exacerbate inequality between the generations (Scruggs & Allan, 2008).

In brief, most developed countries are facing an aging population and this is expected to have a significant effect on income inequality and government spending. Therefore, governments attempt to bring in new policy instruments particularly focused on pension reform to deal with an aging population. In the following section, the main characteristics of pension reform in developed countries and its distributive outcome are reviewed.

6.2.2. Aging population and pension reform

Usually, it is believed that the aging phenomenon has a negative effect on income distribution since the elderly are likely to have less income than working-age people are, so they are likely to fall into poverty. Thus, we expect income inequality to increase as we have more elderly in our society.

The pension system had been the main pillar of the welfare state as a means for the elderly to maintain their purchasing power by income support (Bonoli & Natali, 2012). The pension is a not the only social protection system to help the elderly because other welfare programmes also affect the income of the elderly. However, although the income of the elderly can be influenced by different kinds of welfare policy, a pension is still considered the most significant means of income support. Recently, as the proportion of elderly has increased, the government needs to spend more on its pension programme and has to bear the inevitable fiscal burden caused by the increase in pension expenditure. An aging population also implies that there will be more spending on health, long-term care and so on.

Low fertility rates leads to the reduction of the working-age population which means that governments suffer from a lack of funding to support old-age benefits. To overcome this financial burden, the government must reform the social protection programme of the welfare state. In particular, the reform of pension policy is a major part of the transformation of the welfare state as it forms a large part of welfare spending. The generous pension systems which have been employed by most developed countries have been criticized as they increase the fiscal burden on the government during a period of low economic growth. In addition, economic experts insist that current pension systems give an incentive to those who want early retirement and makes workers work less, so it is argued that current generous pension systems are not sustainable for those economic reasons (Marie, 2005). Also, countries are exposed to international competition because of globalisation so they try to stay competitive, so pressure on the welfare state is getting higher and higher (Ohmae 1994; Reich, 1991). The effect of globalisation is still controversial, as was seen in the previous chapter, but it is still argued that economic globalisation leads to reform (retrenchment, mostly) of the welfare state.

However, reform of welfare policy, including the national pension programme, is not easy. Tsebelis (2002) stated that reform of the welfare state is difficult since there are many veto players in the politics of a welfare state. Pierson (2004) stated that welfare programmes are closely related to each other so a change to one part can affect the efficiency of the other parts. Thus, welfare institutions tend to have path dependency. In particular, the pension system has been considered as one of the most difficult institutions to reform. The government has to increase the contribution rate or cut benefit to contain pension spending, but both measures can be unpopular with voters since it means that the disposable income of both sectors is reduced (Bonoli, 2003). Consequently, the reform of a pension programme is likely to face political protest so the government is likely to stick to the current institution and avoid radical transformation.

In addition, a pension programme is a contract between generations (Myles & Pierson, 2001) so it has inertia inevitably. Consequently, pension policy is the typical case that shows path-dependent inertia (Pierson, 2001). Politicians are reluctant to change the current system but they cannot neglect demographic and economic pressure any more so they have attempted to reform the pension system over the last two or three decades and their efforts have often been described as "elephants on the move" (Hinrichs, 2000).

Although radical reforms are difficult to achieve, small changes have still been made in the form of policy drift, layering and conversion (Hacker, 2004). Policy drift means that the effect of a policy is changed without significant changes in policy structure. Under policy drift, practical interpretation and implementation of a policy can be changed without any formal revision. Conversion is also a kind of policy change without formal revision. Conversion occurs when an existing institution has a new direction so the institution allows workers to work within the boundary of the institution to pursue multiple ends (Thelen, 2004; Beland, 2007). Layering refers to the situation in which new policies are added to an existing institution. These three methods show that in reality, pension reform is politically difficult.

Obviously, not every effort to reform the pension system can be interpreted as retrenchment of the welfare state. Some countries have reduced pension generosity radically whereas the change in other countries is only at a modest level (Bergh & Erlingsson, 2009). As already discussed, politics in a pension programme is different from other welfare policy areas. Wolf, Wenzelburger and Zohlnhoefer (2013) showed that many voters are willing to accept cuts in unemployment benefit but not in pension benefit regardless of their political partisanship. They used two international social surveys in 1996 and 2006 in eighteen countries and both surveys showed the same result: the supporters of the right-wing party were against cuts in pension generosity just like the supporters of the left-wing party, so it is not easy to make benefit cuts in a pension programme. In addition, empirical studies have shown that the partisanship of the government does not play an important role in cuts in pension generosity. On the contrary, some have argued that cuts in the benefits of a pension programme are easier in the government of left-wing parties. Voters assume that the left are interested in expanding or preserving the welfare state, so they believe that benefit cuts are really unavoidable in circumstances when a left-wing party attempts to cut the benefit (Ross, 2000; Green-Pedersen 2001; 2002, Wenzelburger & Zohlhoefer, 2013).

This case implies, however, that cutting pension benefit is not easy even for left-wing parties. In general, previous studies have shown that it is very difficult to cut the generosity of a pension programme considering the unique political situation regarding pension programmes. However, changes in the pension system do take place in many developed countries. In those cases, what course the government chooses for the

transformation of the pension programme is the introduction of a supplementary private fund system instead of a public pension (Bonoli & Palier 2007). Transformation from a public to a private pension system came in gradually because of the political difficulties discussed above.

The roles of private funds and public pensions are different in different countries; it seems that the role of private funds is becoming more important, although the role of a private pension and its institutional arrangement depend on the political institution and public consensus in each country, so trajectories cannot be identical across the world. Continental European countries have introduced new pillars of occupational or personal pensions and cut back on public pensions, and Anglo-Saxon countries which already have a multi-pillar system focus on setting a regulatory framework for private pensions. Nordic countries have a hybrid system, based on a combination of a universal public pension and a specific second-tier pension (Ebbinghaus, 2012).

What we can see is that most countries are still undergoing transformation and this transformation includes increasing private funding, a mixed system of private and public, and more delayed and insufficient income support for the elderly (Private fund in the thesis does not include mandatory private pension. It indicates voluntary private pension only). In a broad sense, transformative change is the reduction of the public pension and the expansion of private pensions (Ebbinghaus, 2012). Streeck and Thelen (2005) explained this gradual change by layering, conversion or displacement. A private pension is added as a new layer to a multi-pillar system at first. There is no overall change in the public pillar but the main function of the public pillar is converted from status maintenance to a basic income function in continental Europe, or the main function of the government is converted from the provision of a state pension to control of private pensions in Anglo-Saxon countries. Although the details of the process of transformation are different, one of main trend is that the way to provide pension is becoming more diverse. Public pensions used to be the major source in the past but private pensions are taking a significant part in most countries today. Some countries tend to reduce the proportion of public money in the pension system so that private pensions provide the majority of funding in those countries (Brooks, 2005; Orenstein, 2008). Based on this trend, public pensions are likely to be replaced by private funding, personal savings and collective agreements between employees and employers. Second, the goal of public

policy for the elderly is changing. The previous pension system was blamed for stimulating early retirement because of the generous pension benefits with a relatively short qualifying period, so reforms of the pension system have pursued delaying retirement and promoting the continued employment of the elderly (Jespen *et al*., 2002; Ebbinghaus, 2006). These changes help a government to maintain a sustainable pension system and overcome the fiscal deficit by increasing income tax revenue and reducing the period of pension payment.

These changes are accompanied by an increase in investment in lifelong education for the elderly. An active labour policy is a very relevant tool in the transformation of the welfare state in this regard. An active labour policy provides those who are in unemployment with education and training programmes which will improve their employability. This is one-step further than just offering income protection for unemployment, so we can help the elderly to get back to work through education and training. Details of active labour market policy are discussed in a separate section. It is essential for the elderly, as it is necessary to improve the skills and knowledge of the elderly so that they can remain in the labour market longer than previous generations. In brief, the goal of public policy for the elderly is to support them to stay in the labour market longer, not just provide them with income support.

6.2.3. Pension reform and its distributive outcome

There have been many studies of pension reform in the modern welfare state in terms of its drivers, politics and institutional trajectories, but not many of them have considered the distributive outcome of transformation (Bonoli & Natali 2012). This is very salient aspect of transformation as one of main functions of a welfare state is to redistribute income and contain the poverty level. As has been shown in the discussion above, privatisation and financialization of pension system is likely to lead to insecurity for the elderly. An increase in voluntary private pensions inevitably strengthens the link between current income and pension income so a withdrawal of public pensions and the extension of private incomes is likely to increase the risk of poverty and income inequality not only among the elderly, but also among the entire society. In particular, after the economic crisis hit European countries in 2008 and 2009, it was reported that the income insecurity of pensioners was higher in those countries which had a more privatised and financialized pension system.

In other words, pensioners are likely to be exposed to risk from outside if the country they live in has a more privatised system and an open economy system. Zaidi (2010) projected benefit ratios over the period 2007-2060 based on the current trends in benefit cuts. The benefit ratio is calculated from the value of average public pension relative to average wage. If the benefit ratio is high, it means that the value of the average pension is close to the average wage. His projection showed that the benefit ratio will decrease in 22 European countries out of 27, and it is particularly serious for Sweden, France and Austria. The decline in the benefit ratio of those countries will be more than 20%, so the increase in mandatory private funding cannot offset the cut in the generosity of the public pension. Consequently, future retirees in those countries will have a higher risk of being poorer than the current generation.

There have been several studies of the distributive outcome of increases in private pensions. Caminada and Goudswaard (2005; 2010) found that a public social security system generally has a larger distributive effect than a private social security system, so it can be inferred that an increase in private pensions has a negative effect on income inequality and the poverty rate. Studies based on cross-sectional data have shown that income inequality among the elderly increases as the proportion of private pensions increases (Wells, 2004; Fukawa, 2006). Hughes and Steward (2004) argued that an increase in the proportion of private pensions is associated with an increase in the poverty level among the elderly. It is fair to say that the level of private pensions depends on income level during the working life (Vliet *et al*., 2012), so it can be inferred that high incomes are likely to have a higher proportion of private pensions as supplementary and this will lead to higher income inequality.

On the other hand, there have been studies which have argued that an increase in private pensions does not have any significant effect on income inequality among the elderly. Vliet *et al*. (2012) criticized previous studies for using either only cross-sectional data or descriptive analysis for one or two countries, so they did not capture the dynamic parts of pension reform and failed to generate a universal conclusion. They therefore used time-series data from fifteen EU countries over twelve years and found that income inequality among the elderly in fact decreased as the proportion of private pensions increased. They argued that the absolute increase in private pension benefit is smaller for low incomes

but the relative size of benefit could be larger for low incomes than for higher incomes, but there was no concrete evidence for this.

6.3. Changes in labour market structure and active labour market policy.

6.3.1. The origin of active social policy and ALMPs

The unemployment protection system in most developed countries is based on the heritage of the industrial era (Alber, 1981). The main characteristics of the industrial era were long and stable employment based on a manufacturing economy. However, the importance and proportion of manufacturing began to decrease from the mid-1960s. Benefits provided by the government at that time were focused on financial support which replaced workers' salaries during their unemployment. Unemployment benefit was expected to play the role of an automatic stabilizer during temporary downturns. Unemployment was considered temporary due to periodical economy recessions, so the main role of unemployment benefit was to help the unemployed to maintain their quality of life during unemployment and they were expected to get a job when the economic downturn ended. During the industrial era, unemployment benefit consisted of two systems. The first was unemployment insurance based on contributions from workers and the second was to support workers at the lower level or atypical workers who were unlikely to have a regular type of unemployment insurance. Unlike the pension system, the variation in unemployment benefit systems in different countries was less diverse than other social protection systems as there was no universal system and benefit was either based on contributions or was means-tested, although there were some variations in financing and governance (Clasen & Clegg, 2011). Previous studies have nevertheless shown some extent of difference between different welfare regimes. A universal system was prevalent in most social democratic countries, whereas social insurance was the key component in conservative countries. A means-test system was a common feature of liberal countries, but they also had other types of social assistance (Bambra & Eikemo, 2008).

Even so, changes were noticed in economic trends which affected labour market policy and many studies have pointed out that fundamental changes in the welfare state took place between the late 1990s and the early 2000s (Bonoli, 2013). Industrial employment began to decrease quite quickly and the employment service area started to surge; the

female labour market participation rate began to increase so the importance of the male-breadwinner model began to decline. In addition, service-based economies are likely to have lower increases in productivity so flexibility was more important than stability for efficient production. In addition, service-based economies require highly skilled workers so an increase in service-based economies leads to an increase in the for demand for highly skilled workers rather than for low-skilled workers. Now the demand for low-skilled workers is shrinking even in a time of economic boom.

In this regard, unemployment is not frictional or temporary any longer as unemployment is not a periodical but a structural problem. The unemployed are therefore unlikely to find new jobs if they do not have relevant skills and knowledge, and the risk of unemployment is higher for those who do not have advanced levels of skill or knowledge. These changes in society and in the industrial structure brought about changes in labour market institutions, such as increasing short part-time contracts or time-limited contracts (Bonoli & Natali 2012). Under conventional unemployment protection, the unemployed find themselves under-protected and unemployment protection provides just temporary assistance but cannot remove the fundamental cause of unemployment. Governments also have faced an economic crisis and an age of austerity after a golden age of welfare state expansion, so it is necessary for them to find new strategies for the welfare state (Bonoli & Natali 2012; Bonoli 2013).

The increase in female labour market participation has led to a shift in welfare states which are based on the male-breadwinner model. Domestic work that used to be performed within the household, such as child-care, has to be externalized, so the demand for policy instruments to reconcile work and family life increases. In addition, changes in family structure and behaviour have caused an increase in single parenthood which has raised salient issues for the welfare state, such as income support and child-care, and work for a single-parent family is likely to be exposed to the risk of getting into poverty and the traditional welfare state is unlikely to cover single parenthood. Along with long-term unemployment due to economic structure, these changes are termed the 'new social risk' (Bonoli, 2013) and new social policy instruments are required to deal with these issues.

Consequently, welfare states attempt to find more active policy instruments to deal with this situation. Active social policies are needed to prevent people from falling into

circumstances which require protection from the government and it is necessary to encourage the unemployed and the retired to re-enter the labour market by updating their skills and knowledge. In Sweden, for instance, the government increased employment in the public or para-public sector rather than just providing the unemployed with benefit. This was a kind of active social policy as it provides opportunities to acquire work experience. Now most welfare states have introduced a social policy set which intervenes more actively in the life of the unemployed, such as job training, job-searching consulting and so on. The government not only improves the quality of life of the unemployed, but also promotes national competitiveness by promoting labour market participation and investment in human capital (Bonoli, 2013). Consequently, an active social policy indicates a series of policies to help people back into the labour market by the removal of obstacles to labour market participation and prioritizing investment in human capital.

ALMPs are considered to be one of most salient components in an active social policy. Bonoli (2013) argued that ALMPs are the cornerstone of an active social policy. ALMPs are sets of policies to remove obstacles to entering the labour market (Bonoli 2011), and they have multiple goals. There are some issues about how to define and measure ALMPs practically, and this is discussed in the data and variables section. ALMPs became an important policy tool in many OECD countries from the mid-1990s but the origin of the ALMP can be traced back to the 1950s.

Most experts agree that the Rehn-Meider model in Sweden was the starting point for ALMPs (Bonoli 2011). From 1951, Sweden introduced an egalitarian wage policy which meant identical wage increases across the whole of industry. Industries with low productivity were pushed out of market as they could not bear the wage increase. The redundant workers were unemployed so the government needed to retrain them and to supply a new labour force to the flourishing industries. At that time, the use of ALMPs in Sweden was a way of responding to the shortage in the labour force so the government provided finance for an extensive vocational training programme (Swenson, 2002).

The trajectories of ALMPs from the 1950s are quite diverse in different periods as well as in different countries. In the 1950s and 1960s, most developed countries were undergoing a rapid expansion of their economies so the main objective of ALMPs was to retrain and upskill the labour force. They could then provide industries with workers who

had adequate skills and knowledge. At that time, unemployment benefit was still core for the social protection of the unemployed, and it was not quite related to ALMPs. In the 1970s, most countries went through a recession due to economic crises such as the oil crisis. Many workers lost their jobs and governments provided alternative jobs for them. Governments needed to create direct demand in the labour market as demand in private industries shrank. So ALMPs in the 1970s were focused on the government's need to produce more jobs in the public or para-public sector. After this period, ALMPs began to be integrated into unemployment policy as well. Finally, from the mid-1990s, an activation paradigm emerged in labour market policy. ALMPs in this period put emphasis on employment assistance and the reinforcement of work incentives. Also, integration between ALMPs and the unemployment benefit system was getting stronger. The main trend has been summarized here although the time span of each country could be different. Some countries such as Sweden and Germany began to set out ALMPs earlier and the other countries such as Denmark and the UK developed ALMPs to a significant extent a bit later.

In the meanwhile, the notion of flexicurity became very popular in labour market policy at the international level. Flexicurity is the combination of a relatively liberal labour market with a generous welfare state. It was based on the Danish approach to the labour market which used flexible employment contracts, a high replacement rate of unemployment benefit and a developed ALMP system. The unemployed could easily enter into or exit from the labour market due to low job protection but generous unemployment benefit compensated for the financial difficulties of unemployment. ALMPs also helped the unemployed to move back into the labour market. The EU included its vision of flexicurity in many policy fields including ALMPs (EU, 2007).

6.3.2. Various types of ALMPs

ALMPs cover a diverse range of policies so it is very difficult to define them clearly. This study will therefore attempt to identify the different types of ALMP that are implemented across countries in order to determine what areas ALMPs cover. The dimensions of ALMPs which governments put emphasis on differed slightly between countries. At one extreme, ALMPs were more concentrated on vocational training, removing the obstacles to employment and facilitating re-entry to the labour market. Sweden is a typical country of this type. At the other extreme, ALMPs are combined with stronger work incentives,

time limits on recipiency and benefit reduction. Mostly English-speaking countries fall in this category (King 1995; Peck 2001).

There have been various attempts to distinguish between these two types of ALMP. Barbier (2004) distinguished between liberal activation and universal activation. Liberal activation refers to a system which concentrates on work incentives and benefit conditionality, whereas universal activation refers to a system which concentrates on human capital investment, such as job training and education. Most English-speaking countries fall into liberal activation and Nordic countries into universal activation. Also, continental European countries can be different from Nordic or English-speaking countries so they can be categorized into a third type.

Clegg (2005, cited in Bonoli, 2012) also attempted to distinguish different types. According to his classification, there are two types of ALMP: circulation and integration. Circulation is intended to improve the opportunities for the unemployed to contact potential employers, whereas integration provide the unemployed with jobs directly, such as subsidized jobs or sheltered employment. It is clear that this dichotomy is an oversimplification of real-world policies, but it can be a good starting point for classifying the type of ALMP.

Morel *et al*. (2012) identified a difference between Nordic countries and English-speaking countries. Nordic countries have a combined system between active policy and conventional social protection policy whereas English-speaking countries replace social protection with active policy. Continental European countries are mostly regarded as remaining as conventional social protection welfare states, although they attempt to introduce some of the active policy. In this regard, Morel's analysis is in line with the classification of Barbier (2004).

Kersbergen and Hemerijck (2012) also classified active welfare states into three types. The Nordic welfare states offer a wide range of social services and generous income guarantees, and their ALMP is aimed at maximising the employment rate for both men and women. In contrast, liberal welfare states offer means-tested benefits while increasing ALMP. Continental welfare states, which were based on protection for the male-breadwinner model, are targeting outsiders in the labour market, such as the young, female and low-skilled workers.

Table 6-1 Type of ALMPs

Barbier (2004)	Liberal activation	Work incentive, benefit conditionality
	Universal activation	Human capital investment, education
Clegg (2005)	Circulation	Opportunity for the unemployed to contact employers E.g) placement service
	Integration	Directly providing jobs to the unemployed. e.g subsidized jobs, sheltered employment
Kersbergen & Hemerijck (2011)	Nordic welfare state	Increase in human investment with generous income support
	Liberal welfare state	Increase in job training and job searching with means-tested benefit
	Continental welfare state	Focus on outsiders in the labour markets with male-breadwinner model

6.3.3. Social investment and ALMPs

Another notion which indicates the recent transformation of the welfare state is 'social investment'. Social investment had emerged after the era of neo-liberalism in the 1980s, moving away from the conventional welfare state (Jenson 2012). In the 2000 Lisbon agenda, it was emphasized that social protection systems have to be modernized to strengthen their function to contribute to competitiveness, employment and growth (Cantillion, 2011). The aim of this is better social inclusion through higher labour-market participation.

Bonoli and Natali (2012) identified three main blocks of social investment. The first is constant learning. The social investment perspective emphasises constant learning to update the skills and knowledge of workers as well as childhood education. A knowledge-based economy brings about rapid changes in the labour market so governments have to provide constant learning to help workers to have adequate skills and knowledge. Childhood education, job training and supporting job seeking all reflect this dimension. The second dimension is an orientation to the future. Investment is closely linked to the return in the future. Spending occurs in the present but investment generates dividends in the future. This dimension contributes to shifting the notion of the welfare state from

passive expenditure to preventive investment. In this regard, childhood education and child poverty are considered more important than tertiary education and adult poverty, as they are very salient to determining the future well-being of today's children, and that can be regarded as a return on investment. The third dimension is the link between individual and collective well-being.

The social investment perspective claims that investment in individuals leads to common prosperity in the future for all. The policy instrument for education or job training is expected to contribute to breaking the intergenerational cycle of poverty and reducing unemployment. The changes caused by the policy are related to lower crime rates and a more stable society, so society and community can get benefit from social policies in the end. Those sets of policies are desirable from an economic perspective and not only from the social justice perspective. Empirically, measurement of social investment normally includes expenditure on parental leave, elderly care, child-care and education, as well as ALMPs (Vliet & Wang, 2015).

In brief, a social investment state considers social policy not as a cost, but as an investment in human capital. Social protection is not just designed to help people at risk but also to prepare them to have a more stable job. In this regard, social policies are essential to economic development and employment growth. On the one hand, social investment rests on investment in human resources, such as childhood education, life-long training and so on. On the other hand, social investment is the best use of human resources, such as supporting women's and lone parents' employment (reconciliation policy, child-care, parental leave and so on). Social investment seems to be in line with active social policy in that both of them emphasise the more active role of the government and ex-ante prevention rather than ex-post protection. However, still, there is a difference between active social policy and social investment. Social investment is focused on human capital and the notion of equality of opportunity but little attention is paid to work incentive. On the other hand, active social policy is more concentrated on direct linkage to helping people to enter the labour market by the removal of all obstacles to labour market participation, so the work incentive is a very important component in active social policy (Bonoli, 2013). In brief, social investment and active social policy cover slightly different areas although there are some areas where they overlap. ALMPs are

considered as important components for both social investment and active social policy (Bonoli, 2012)

6.3.4. The distributive outcome of ALMPs and social investment

Now, we can ask a question about how ALMPs affect income distribution. Do ALMPs play a positive role in supporting the poor? Does a different type of ALMP have a different effect on income distribution? Do ALMPs decrease income inequality or not? As shown above, there have not been many studies of the distributive outcome of ALMPs. Some studies have examined the distributive outcome of social investment but not ALMPs.

Vaalavuo (2013) examined the distributive outcome of social investment but excluded ALMPs because ALMPs are the part of social investment but their proportion is only marginal so they are not included in social investment. On the other hand, there are some studies which have examined the effect of ALMPs on employment. Card *et al.* (2015) reviewed more than 200 econometric evaluations of ALMPs from around the world and found that the effect of ALMPs is close to zero in the short term but becomes a positive effect after two or three years. The effect becomes larger for females and the long-term unemployed. They showed that ALMPs are mostly effective at increasing the opportunities for employment in the long term and are more significant for female workers and for the unemployed in the long term. In addition, the effect becomes more significant during an economic recession. It seems that most studies agree that ALMPs are a useful policy instrument to promote employment.

Based on those studies, ALMPs are intuitively expected to decrease income inequality. If ALMPs help the unemployed to find a job and reduce the time they are dependent on unemployment benefit, the unemployed are likely to have more income, as normally their income in new jobs is higher the unemployment benefit. In particular, the objective of ALMPs is to upskill the labour force so that low-skilled workers who do not have a high income can enter into the well-paid high-skilled job market if they can successfully finish a re-training programme. Thus, ALMPs can be a useful instrument to push up the income of the poor so that income inequality can be reduced.

On the other hand, however, income inequality can increase or remain at the same level if the quality of jobs that the unemployed get after re-training is not decent. ALMPs includes direct job provision to the unemployed particularly in the public sector but the

important part is to provide a training programme. It helps the unemployed to get adequate skills and knowledge but it is not easy to find a decent job when the economy is in recession. Morel *et al.* (2012) pointed out that focusing on activation often disregards the quality of work. Sometimes workers fail to get out of poverty even when they find a job, as the jobs they find do not provide them with a sufficient wage to get out of poverty.

In addition, usually, ALMPs are more concerned about the 'future' of the unemployed, rather than 'present', so the poor today are likely to be left aside (Morel *et al.* 2012). As shown above, Nordic countries have a kind of dual system which has ALMPs on one side and a conventional social protection system on the other, but English-speaking countries are likely to replace a conventional social protection system with ALMPs. As shown above, ALMPs neglect the quality of a job, so when the unemployed cannot get a job or fail to get a well-paid job, their income can plummet because their unemployment benefit is also reduced. In this case, income inequality could be worsened even though the government is spending more money on ALMPs.

However, there have not been many studies of the distributive outcome of ALMPs, but there are nevertheless some empirical studies which have examined the effect of social investment on income distribution, and which help us to infer the distributive outcome of ALMPs indirectly. Vliet and Wang (2015) evaluated the effect of social investment, including ALMPs, by using data from fifteen developed countries over ten years. They showed that social investment including ALMPs or primary/secondary education had a significant positive effect on improving the employment rate but did not show any significant effect on poverty reduction. They pointed out that social investment can help people to enter the labour market but does not really guarantee a decent job. More people get into the labour market and get a chance to work, but in fact, those jobs do not pay them well so it does not show a significant effect on poverty reduction.

However, although these studies have indirectly examined the distributive effect of ALMPs, it is still not quite clear. Previous studies have argued that the insignificant effect of social investment on income distribution is mostly due to nature of service policy, such as child-care service or primary education. Esping-Andersen, for example, pointed out that service policy is less distributive than direct cash transfer (Esping-Andersen & Myles 2009). Cantillon (2011) also offered a reason why social investment does not have a

significant effect on income distribution. She pointed out that employment growth occurs only in employment-rich households rather than in employment-poor households.

She analysed data from EU-SILC and showed that the number of people of working age in jobless households decreased from 13% in 2005 to 12% in 2008, and the number of people of working age in job-rich households increased from 44% in 2004 to 48% in 2008. Namely, a household in which one or two members are already in work can get more benefit than a household in which no-one is in work. She argued that this is mainly due to the ambivalence of social investment. Social investment aims at moving people into work so it normally starts by making work attractive. This strategy inevitably benefits those already in work. Family-work balance policies such as parental leave and child-care services are an example of this.

She argued that the statistics show households at new risk, such as a lone mother or a low-educated household, are less likely to use those policies. In this case, the poor household is likely to get less benefit from a set of policies which make work attractive. Consequently, only middle or high-income groups can get a benefit from those policies and this makes income distribution worse. This is in line with the so-called 'Matthew effect' which means that the middle class is likely to be the main beneficiaries of welfare policy.

Vandenbroucke and Vlemincks (2011) called this a 'resources competition explanation' of upward pressure on poverty. Social service is less distributive than cash transfer as we can see in the case of child-care service, and poverty remains high as more resources are concentrated on social service than on cash transfer. Ghysels and Van Lancker (2011) also showed that Matthew effects are found in child policy as high-income couples or highly educated couples can get more benefit from child-care service. These studies argued that service policy is the main reason for the insignificant effect of social investment. In addition, there are some studies which have argued that the effect of primary education on income distribution cannot be measured in the short-term as it takes much time to see how well primary education affects the income of students when they grow up.

In brief, most of the studies of the distributive outcome of social investment found no significant effect, which is possibly due to the nature of service policy or education policy. It can therefore be inferred that this result cannot necessarily indicate that ALMPs do not have a significant effect on income distribution.

Consequently, the distributive outcome of ALMPs remains largely unanswered. A few studies based on specific country contexts have suggest that a clear relation is not observed, but it is hard to generalize. Studies which have examined the distributive outcome of social investment have shown that social investment policy does not have a positive effect on the poverty rate or on income inequality. However, the main cause for this is that service policy is less distributive than cash-transfer and this is focused on child-care service or work-life balance policies, which are included in social investment but not in ALMPs. Therefore, they cannot offer evidence which proves the distributive outcome of ALMPs and it is necessary to examine the distributive outcome of ALMPs, rather than broader concepts such as active social policy or social investment.

6.4. Conclusion

This chapter has reviewed the challenges that the welfare state is confronting, policy instruments to deal with these challenges and their distributive outcome. Developed countries are confronted with an aging population and most countries have attempted to reform the public pension system and introduce private pensions. The introduction of private pensions is expected to have a negative effect on income inequality as it is likely to increase inequality between the better-off and the poor. However, previous empirical studies have shown inconsistent results on the effect of private pensions. It should be noted that the effect of an increase in private pensions has to be considered in the context of the institutional design of the public pension system as they are very closely associated with each other.

In the meantime, the welfare state is also emphasizing an active and preventive role for welfare programmes, rather than continuing with passive income protection. Thus active labour market policy is considered as an important policy instrument to deal with long-term unemployment due to changes in the industrial structure. The main goal of an active labour market policy is to provide education, job training and other programmes to improve the capacity of the unemployed and increase their opportunity to re-enter the labour market. Some empirical studies have shown that an active labour market policy is useful for increasing the employment rate, but its effect on income distribution is not clear. In fact, there have not been many empirical studies which have examined the distributive outcome of an active labour market policy. In addition, the distributive outcome of an active labour market policy is also expected to be closely related to the

unemployment benefit and other social protection programmes to support unemployed individuals.

In brief, the welfare state attempts to introduce new policy instruments but their distributive outcome is still largely unanswered. Of course, it is true that we need much data to examine the distributive outcome of new policy instruments and some argue that there is still not sufficient data available (issues of data quality on ALMPs will be discussed in Chapter 10). For these reasons, it is understandable that there are not many empirical studies of this issue. However, as has been demonstrated in this chapter, a welfare programme is quite an important determinant of income inequality and it is also a useful instrument for suppressing the increase in income inequality. Thus, this thesis has tried to examine the distributive outcome of new policy instruments using panel data which contains the most recent information. In particular, this thesis concentrates on the interplay between new policy instruments and traditional protective welfare programmes. Details about the framework and the methodology of analysis are explained in the following chapter.

Chapter 7. Framework of analysis and methodology

7.1. Introduction

Previous chapters have shown that income inequality is a very important factor which affects various social problems so it is essential to minimise income inequality to stabilise a society. Therefore, the question is how to reduce income inequality and establish the relevant institution. To find an answer to this question, first, this thesis reviews important factors in determining income inequality from previous studies. As shown in the previous chapter, there are various factors which affect income inequality. Conventional discussions of income inequality focus on the economic and political aspects. The development of technology, which increases the demand for a high-skilled labour force, brings about an imbalance in the labour market, and is often referred to as an economic factor. In the meantime, political factors are also considered as determinants in income inequality as discussed in chapter 3.

In addition, the various types of welfare institution also play an important role in shaping income distribution. Unlike economic or political factors, welfare programmes affect income inequality ex-post, after it is determined through the market and political system. The institutional design of a welfare state has been developed in various ways because of differences in political and economic conditions and previous studies have shown the differences in welfare institutions and how welfare effort can make a significant difference to income inequality.

However, welfare institution, which is designed to tackle down income inequality, had been established based on working-age male breadwinner model (Korpi, 2000). Thus, we need to ask to what extent the current welfare institution matters in containing income inequality caused by current demographic changes. As shown in the literature review, change of demographic changes such as ageing population is often referred to bring about significant changes in income distribution and welfare state itself. In the meantime, a rapid development the technology and industry changes labour market structure, so new type of unemployment is emerging. Welfare state introduces new policy instruments to deal with these changes.

However, the distributive outcomes of these new policy instruments (or welfare reform) have not been well explored. In particular, there have not been many empirical studies

using large panel data. This thesis will therefore attempt to analyse the effect of new policy instruments on income inequality. This chapter describes details of the methodology and the research framework and is structured as described below.

The framework of the analysis is introduced first. This thesis will attempt to analyse the distributive outcome of new policy instruments but previous studies have shown that new policy instruments are deeply related to a traditional welfare programme. Therefore, this section explains the relationship between a new welfare programme and the traditional welfare programme and how they are connected to each other in this thesis. Then, the research methodology is explained. This study employed multi-level modelling as an alternative to the fixed-effect and random-effect models which are frequently used for panel data. The reason why this method fits into the framework of this study is also explained. Details of variables and the methods to measure them are explained in the main analysis chapter, as they are slightly different in their focus. This current chapter only explains the big picture and the contours of variables and measurements. At the end of this chapter, the general hypotheses to be examined are proposed, but again, more details of them are explained in the analysis chapters.

7.2. Framework of analysis

As stated above, this study focuses on changes in the welfare state and its distributive outcome. 'Change' of the welfare state in this study can refer to the introduction of new policy instruments or the reform of current welfare policy. As reviewed in the previous chapter, there has been much discussion of this change, but this thesis concentrates on the effect of private pensions and an active labour market policy. The previous chapter showed that an aging population and changes in economic structure and the labour market can be significant challenges to the welfare state. The introduction of private pensions and active labour market policies are introduced to deal with these challenges. Therefore, this study will examine the distributive outcome of the increase in private pensions and an active labour market policy considering other economic and political variables.

However, many previous studies have shown that the effect of new policy instruments has to be considered in the context of the traditional welfare programme. The effect of private pensions is closely related to the institutional design of public pensions, and the

effect of ALMPs is also related to unemployment benefit and other forms of social assistance for unemployed individuals. The following section reviews the relationship between new policy instruments and traditional welfare policy.

7.2.1. Effect of private pension and institutional design of public pension system

A pension programme for the old-aged population has two distinct goals: income security and basic security (Palme, 1990; 2006). Income security is that the pension programme replaces the income earned during earlier working life and basic security is that the pension programme provides a minimum income standard at floor level. Pension programmes attempt to achieve both goals, but the relative emphasis is different according to the institutional design. It can be inferred that the distributive outcome of a pension programme will be different according to the institutional arrangement.

Some empirical studies have examined the relationship between a pension programme and income distribution to the old-aged. Kohl (1990) argued that higher basic security entitlements are related to lower poverty rates among the elderly. Palme (2006) showed that a high replacement rate of a pension programme is related to less inequality among the elderly. He argued that the impact of a pension programme is different according to the type of pension, and the result shows that a generous pension programme reflecting basic security is related to a decrease in income inequality among the elderly, whereas a generous pension programme reflecting income security is not significantly related to changes in income inequality.

Scruggs (2006) did not specify pension generosity, but he showed that a generous welfare state which has a generous pension programme is related to less poverty and inequality. Lefèbvre (2007) argued that the distributive effect of a pension programme is different according to the design of the pension system, but that, generally, a generous pension system is related to a decrease in the poverty rate and income inequality among European countries.

Regarding the distributive effect of private pensions, the distributive outcome of an increase in private pensions shows inconsistent results, as shown in the previous chapter: some studies have shown that income inequality decreases as private pensions increase. What we need to note here is, however, that the effect of private pensions is related to the institutional design of public pensions (Palme, 2006). The institutional design of the

public pension affects income distribution among the elderly, so it is expected to influence the effect of private pensions as well. In fact, there has been a long debate on how the institutional design of a pension scheme affects income distribution. The mains topics discussed are eligibility (universal or targeted) and benefit level (flat rate or earnings-related). In fact, this debate is largely related to the paradox of redistribution discussed in the previous chapter.

Le Grand (1989) argued that universal eligibility can bring about a waste of resources in poverty reduction and even intensify income inequality as the rich can get the universal benefit as well as the income from their own savings and assets. In contrast, Fritzell (1991) and Mitchel (1991) argued that a universal welfare system seems to be a better way to obtain greater equality. However, it seems that most studies have agreed that universal eligibility has better income distribution than a targeted system (Korpi & Palme 1998), although there is still some controversy about it. Regarding earning-relatedness, Mitchel, Harding and Gruen (1994) argued that a strong earnings-related pension is likely to aggravate income inequality as income inequality among the working-age population is reflected in old age under an earnings-related pension system. Castles and Mitchell (1992) also argued that universalism can bring greater equality but that strong earnings-relatedness worsens income inequality more than a flat rate benefit system. However, Korpi and Palme (1998) found that an unequal pension system is related to equal income distribution. In other words, countries with an earnings-related system in which pension benefit is dependent on previous income are likely to have more equal income distribution than countries with a flat-rate system. Palme (2006) argued that an unequal pension system with earnings-related benefits makes a private pension less attractive since the recipient can get sufficient benefit from the public pension. In contrast, an equal pension system with a flat rate is likely to have a low benefit level so the rich have more incentive to have a private pension whereas the poor cannot afford to have a private pension so income inequality is likely to worsen. In brief, previous studies have shown that both eligibility and earnings-relatedness are important factors affecting income distribution and it is the same with moderating the effect of a private pension as well. However, earnings-relatedness seems to be more controversial than eligibility.

Previous empirical studies of the distributive outcome of private pensions have either focused on a few countries only or have used cross-sectional data. Vliet et al. (2012) used

time-series cross-sectional data but they did not consider the institutional design of the public pension. It is therefore necessary to examine income distribution and current pension reform focusing on private pensions and considering the institutional design of public pensions. It is expected that the effect of private pensions will depend on the design of the public pension programme.

7.2.2. Active labour market policy and unemployment benefit

There have been many studies of the distributive effect of conventional unemployment benefit. Those studies have shown that the institutional design of unemployment benefit has a significant effect on income distribution. Palme (2006) showed that a high replacement rate and a longer duration have a significant effect on reducing the poverty rate, and Korpi and Palme (1998) showed that countries with a universal benefit system are likely to have a lower poverty rate and income inequality. At the same time, active social policies have a close relationship with conventional protective social policies as they have emerged as a policy instrument to deal with new social risks due to changes in the economic and social environment, which had not been a salient issue under the traditional welfare state (Bonoli, 2013). Thus, active social policies have been developed within the context of the traditional welfare state institution so its distributive effect is also influenced by the existing welfare institution. In this regard, it is fair to say that the effect of ALMPs on income distribution is influenced by unemployment benefit as well.

Not many studies have looked into the relationship between ALMPs and the traditional welfare institution. Cantillon (2011) argued that the generosity of conventional passive income protection has decreased whilst spending on active social policy has increased. OECD data show that the average net replacement rate for the long-term unemployed as well as for individuals at the initial stage of unemployment had decreased between 2001 and 2008. Nelson (2007) also showed that social assistance has tended to decrease over the last two decades. Many studies have shown that the unemployment benefit is reduced through making benefits more selective and conditional, or reducing duration and generosity (Caminada *et al*. 2008; Van Vliet 2010; Kühner 2015).

Vandenbroucke and Vlemincks (2011) called this a re-commodification explanation. Bonoli (2009) argued that one extreme of ALMPs is the protection of employment and that the other extreme is re-commodification, such as retrenchment of unemployment

benefit. Vandenbroucke and Vlemincks (2011) argued that it is hard to deny that ALMPs partially contribute to the re-commodification and retrenchment of the traditional welfare state, although some countries have cut benefits without increasing ALMP. The budgetary resources of governments are scarce and limited so focusing on ALMPs tends to decrease unemployment benefit. Studies have pointed out that an increase in ALMPs is connected to the retrenchment and re-commodification of the traditional unemployment benefit and this brings a disappointing consequence in poverty trends.

In contrast, Kersbergen and Hemerijck (2011) argued that the current trend of poverty and income inequality is not very related to the emergence of ALMPs. They insisted that increase in income inequality is not related to changes in welfare state. They pointed out that income distribution is more affected by economic and labour market factors than by the welfare state. Income inequality had decreased during the first decade after the Second World War and this was not because of the welfare state, but because growing productivity in low-skilled workers was faster than in high-skilled workers so incomes at the lower end increased faster than at the high end. In this regard, the main drivers for rising income inequality are globalisation and technology-driven economic growth which increases the demand for high-skilled workers, rather than welfare reform. In addition, some studies have argued that decreases in expenditure on the traditional welfare state have taken place only in a limited number of countries, and the quality of the conventional welfare system has not changed much (Vliet & Wang, 2015). The main point of those studies is that ALMPs are not closely related to the decrease of the traditional welfare state or the trend of income distribution.

What we want to focus on here is the effect of the quality of unemployment benefit and its interplay with ALMPs on income inequality. Generous unemployment benefit helps the unemployed to maintain their quality of life and consumption level by offering income protection. Thus, it helps the unemployed to avoid getting into poverty and works as a stabiliser on the business cycle. In addition, unemployment benefit can assist job searching so the unemployed have more time to look for a more relevant job for them without concern for their livelihood. Thus, generous unemployment benefits make a contribution to better job matching and that leads to lower unemployment, poverty reduction among the unemployed and smoothing the individual's consumption during unemployment (Cullen & Gruber, 1996; Gabe & Whittaker, 2012).

On the other hand, a number of empirical studies have suggested that generous unemployment benefit induces longer unemployment duration and that sanctions or strict eligibility for unemployment benefit have a significant effect on reducing unemployment duration and the exit rate from welfare to work. Empirical studies have shown that sanctions increased the number of months in employment by 0.6-0.8 months in Germany and increased the exit rate by 100% in the Netherlands (Hofmann, 2008; Van den Berg *et al*., 2004). Job-searching is necessary during benefits and also shows a significant effect on reducing unemployment duration (Johnson & Klepinger, 1994). Scarpetta (1996) examined the relationship between unemployment benefit and employment rate using data from OECD countries from 1983 to 1993 and found that a generous unemployment rate, such as a high replacement rate and long duration, has a negative effect on employment rate; in other words, this study shows generous benefit is related to longer unemployment. In addition, he found that high generosity of unemployment benefit also deteriorates the capacity of the labour market to adjust itself to social/economic changes. Carrasco (1999) and more recently Roman, Congregado and Millan (2013) have also shown that a high replacement rate in unemployment benefit is significantly related to a longer period of unemployment.

In addition, unemployment benefit raises the reservation wage, which is the level of wage that an unemployed person is willing to accept in work, so the unemployed reduce the effort necessary for job searching and their willingness to accept job offers because of the generous unemployment benefit. In this regard, a generous unemployment benefit causes the unemployed to stay in unemployment and leads to a negative impact on income distribution. Based on the findings of the studies discussed above, it can be inferred that a generous unemployment benefit could have a damaging effect on income distribution by causing the unemployed to stay in unemployment for longer. In addition, a generous benefit can also reduce the effect of ALMPs by removing the incentive for the unemployed to get a job. In other words, a generous unemployment benefit could reduce income inequality or the poverty level by itself, but it also reduces the effect of ALMPs on the employment rate and possibly income distribution as well.

However, the notion of flexicurity provides a different logic for the relationship between ALMPs and traditional unemployment benefit. The case of Denmark, which succeeded in reducing its unemployment rate dramatically, shows that ALMPs combined with a

generous unemployment benefit can be useful for reducing the unemployment rate. This may be special case, but it could be inferred that an increase in ALMPs combined with generous unemployment benefit could have a positive impact on income distribution.

Most previous empirical studies have simply compared data on poverty rates and expenditure on ALMPs (Kersbergen & Hemerijck ,2011; Cantillion, 2011; Morel *et al.* 2012). It is true that the poverty trend is increasing and that expenditure on ALMPs is increasing, but this cannot be evidence that there is a significant relation between the two. A more rigorous quantitative method with a large data set is required. In addition, previous studies have mostly focused on specific components of unemployment benefit, such as replacement rate or duration. However, each of these is part of the institution of unemployment benefit so it becomes important to see how they are combined as a whole institution. In addition, as discussed in the first section of this chapter, there is another programme called MIP which can affect income distribution among the working-age population along with unemployment benefit. MIP acts as the last safety net for the unemployed so it has to be considered together with unemployment benefit.

7.2.3. Framework, sample and size of analysis

This study assumes that the institution moderates the effect of policy. Therefore, the effect of private pensions or ALMPs is in fact different by institution from public pensions or unemployment benefit. Of course, other variables in economics and politics are still considered very important. Therefore, the framework of analysis can be shown as below.

Figure 7-1 Framework of analysis
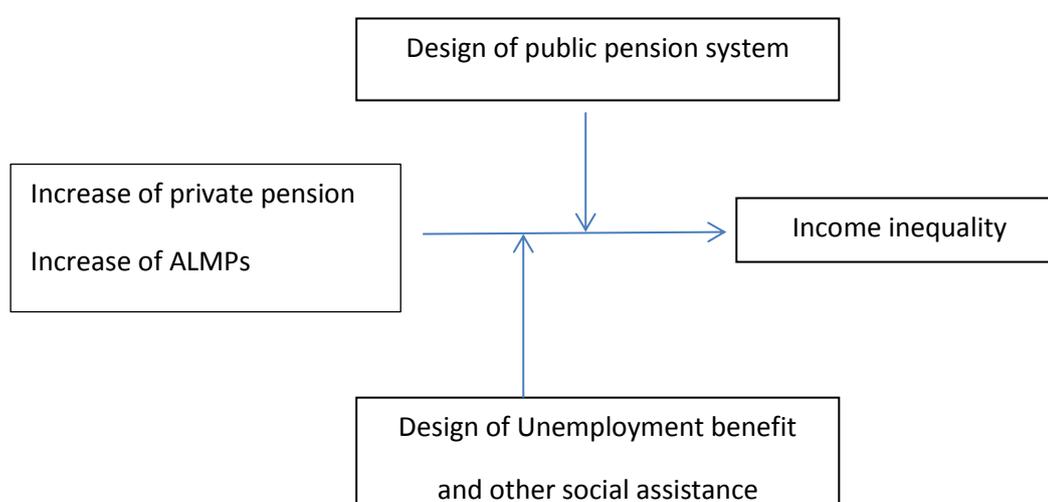
One of the most important things in this analysis is to clarify which institutional dimension is important in moderating the distributive effect of private pensions or ALMPs. It is possible to classify a public pension system or unemployment benefit after identifying which dimensions matter. Discussion of this is based on the classification between universalism and targeting, but it is a more complicated issue so details of the classification are discussed in the analysis chapters and are only briefly explained in this chapter.

Regarding the public pension system, the most frequently used factors in terms of association with a private pension are earnings-relatedness and eligibility (Korpi & Palme 1998; Palme 2006). They argued that the effect of a private pension is insignificant under high earnings-relatedness and eligibility, as people do not have the incentive to join a private pension scheme. So the institutional design of public pensions is classified based on the level of earnings-relatedness and eligibility.

Unemployment benefit is a bit more complicated. Unemployment benefit is designed to support the unemployed, but they are also supported by various types of social assistance, so the two supports should be considered together. There have not been many studies which have looked for what factors in unemployment benefit affect the role of ALMPs, so this current study assumes that earnings-relatedness and eligibility of unemployment have an association with the effect of ALMPs on income distribution, just like a pension programme. Along with the design of unemployment benefit, the characteristics of other social assistance programmes for the unemployed are also considered when classifying the types of a support programme for the unemployed.

This thesis includes 21 OECD countries, Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, the United Kingdom and the United States. However, the actual number of countries was slightly different according to the main topic of analysis, as there are some differences in the numbers of countries from which data are available. These countries were selected as they have similarities in their levels of economic development and political systems based on democracy. Most previous studies of the welfare state and income distribution have also been based on these countries (Korpi & Palme 1998; Palme 2006; Allan & Scruggs 2001; 2006; Kenworthy 2006). Some East European countries also have available data, but those countries have

some degree of difference in economic development compared with the countries in the sample. In particular, most East European countries are transition countries, so there are still substantive differences in their political systems. Thus, it is better that East European countries be dealt with in a different context from the countries in the sample. Asian countries, such as Japan and South Korea, are also excluded as these countries have a different path in the development of their welfare states and political systems.

This research covers 31 years (1980 to 2011) in private pensions and 26 years (1985 to 2011) in ALMPs. Data could have stretched back to the 1960s, but there is a great deal of missing information in data from the 1960s and 1970s. In addition, there were many economic and political changes during that period so we would have too many variables to control if data from the 1960s and 1970s are included. The welfare state is regarded as having entered a period of permanent austerity from the 1980s so the 1980s can be regarded as a critical point in terms of welfare transformation (Pierson, 2001; Wenzelburger, 2013). Regarding ALMPs, the time span is reduced to about twenty-six years from 1985 to 2010 as data on ALMPs are rarely available before 1985. The frequency of inclusion in the analysis is a bit different by topic, so the details are explained in each chapter.

7.3. Methodology: how to use time-series data in the analysis of institution

7.3.1. Fixed effect and random effect model

One of the most frequently used methods for comparing welfare states is time-series cross-sectional (TSCS) analysis. Cross-sectional analysis using country-level data often suffers from the small-N problem since the number of countries is likely to be limited. Time-series data solves this issue by using multiple data for each country over time so we can have more samples to examine.

The classic 'small N' problem was regarded as an important issue in using regression analysis in a country-level comparative study. Since the number of countries included in the model is limited, regression analysis using the country-level variable inevitably suffers from the small N problem. TSCS solves this problem by using observations measured repeatedly over time. If there are twenty countries that we can use for five years, then we have a hundred (20x5) observations that can be put into the model. In addition, TSCS is

useful since it captures both country-specific effects and time effects at the same time. Other advantages of TSCS have been discussed widely in previous studies (Beck & Katz, 1996; Kittel and Winner, 2002) so they do not have to be recapped in this section. Obviously, TSCS is a very useful method for comparative political economy research but it still has some issues to overcome.

In order to get robust estimations from the regression, X_i and Y_i have to be independently distributed (Stock & Watson, 2012; Woodridge, 2002). However, previous studies have shown that data for comparing welfare states are not likely to satisfy those conditions (Beck & Katz 1995; Wilson & Butler 2007; Plümper, Troeger & Manow 2005). The most important issues are unit heterogeneity and non-stationarity (Kühner, 2007; Podesta 2006). Cautious model specification would be one remedy to deal with these issues. In stochastic analysis, stationarity is assumed that the mean and variance do not change over time. However, TSCS data in welfare state are unlikely to meet this assumption. For instance, policy-makers typically begin with the last period's budget and tend to make incremental changes when they make a budget for new period (Podesta, 2006). In this sense, data on budget cannot be stationary. However, the stationarity is usually assumed in the comparative welfare state research unless observations have dramatic change, otherwise it is almost impossible to use TSCS data in the comparative welfare state research (Podesta, 2006)

Unit heterogeneity is closely related to auto-correlation and omitted variable bias. However, TSCS uses observations measured repeatedly for each country so observations for the same country over time are likely to be highly correlated to each other. Those observations measured repeatedly for one country tend to be correlated to each other since each country has some country-specific characteristics which are difficult to measure. Therefore, the regression model without country-specific characteristics is likely to suffer from omitted variable bias. Simple Ordinary Least Square (OLS) regression which assumes no serial correlation and no country heterogeneity is likely to fail to produce robust estimations.

The fixed-effect model is frequently suggested to control country heterogeneity (Beck & Katz, 1995; Podesta, 2006). The fixed-effect model treats country-specific characteristics as fixed effects. The fixed effects can be both country-specific variations and time-specific variations. In other words, the fixed-effect model can capture both variables that do not

change over time (but remain the same for each country) and do not change across countries (but remain the same for specific years) by including a dummy variable for countries or years (Stock & Watson, 2003).

In other words, all higher-level (country-level in this case) variances are controlled and what remains is the within-country effect (Allison, 2009). The fixed-effect model is considered a good instrument for controlling unobserved national characteristics, so it helps us to see the pure effect of independent variables stripped of those fixed effects. A simple method for using the fixed-effect model is to include a dummy variable for each country.

$$y_{ij} = \sum_{j=1}^{j} \beta_{0j} D_j + \beta_1 x_{ij} + u_j + e_{ij}$$

Where D_j indicates the dummy variable for each country and x_{ij} is the independent variable. U_j and e_{ij} are variances in country level and occasion level respectively. However, dummy variables for each country account for all variances at the country level, so $U_j=0$ in the fixed-effect model. β_1 is the size of effect of variable X_{ij} on Y in the given country. The fixed-effect model does not suffer from heterogeneity bias since country-level variance is controlled by the dummy variables (Bell & Jones, 2015).

However, the fixed-effect model does has a limitation. Since the objective of the fixed-effect model is to control the country-specific variables, it is not possible to estimate time-invariant variables because they are already treated as fixed effects (Bartel, 2008), so those variables are automatically dropped. In other words, fixed effects absorb all of the variations between countries so the effect of an independent variable is solely a within-country effect. The effect of X on Y is shown in only a given country in the fixed-effect model so it is impossible to test not only a between-country hypothesis but also slow-changing variables in the fixed-effect model (Beck, 2001; Bell & Jones, 2015). Fixed-effect models lose a lot of information such as a political institution or other time-invariant variables regarding the welfare state. For instance, the institutional design of a pension system or unemployment benefit cannot be tested in the fixed-effect model as these variables either remain the same over time or change very slowly.

On the other hand, the random-effect model treats U_j as a random variable so it considers the between-entity effect as well as the within-entity effect. In other words, estimations

from the random-effect model are a mixture of within-entity effect and between-entity effect. In addition, the random-effect model is based on the GLS (Generalised Least Square) model, so it can control autocorrelation (Reed & Ye, 2009).

The random-effect model is preferable in that it has greater flexibility and generalizability, and especially its ability to test variables measured only at country level (Bell & Jones, 2015). The major advantage of using the random-effect model is that it is possible to include a time-invariant country-level variable in the model so the effect of the between-countries hypothesis can be tested (Bartel, 2008). However, the random-effect model is not frequently used in economics and political science. The major weakness of the random-effect model is its unrealistic assumption that unobserved heterogeneity is uncorrelated with independent variables.

The random-effect model is used to divide unexplained residuals into two categories: higher-level residuals between higher-level entities (countries) and lower-level residuals within these entities. Higher-level residuals (U_i) and lower-level residuals (e_{ij}) are separated from each other and each of them has a normal distribution. According to the basic assumption of regression analysis, the independent variable (X_{ij}) should not be systemically related to residual (U_i, e_{ij}). It can be expressed as $E(U_i \mid X_{ij}, Z_j)=E(e_{ij} \mid X_{ij}, Z_j)=0$ and it is same with Cov $(U_i, X_{ij})=0$. This means that the independent variable is not related to country-level variance. However, this is a very unrealistic assumption since independent variables are very likely to be associated with country-specific characteristics in most cases, so such endogeneity is the main reason that the random-effect model is less likely to be used than the fixed-effect model (Bartel, 2008; Beck, 2001; Wilson & Butler, 2007).

7.3.2. An alternative way: the basic logic of multilevel modelling

To overcome the disadvantages of the fixed-effect and random-effect models, this present study employed multi-level modelling. Before going into the details of how to apply multi-level modelling for TSCS data, it is necessary first to explain the basic logic of multi-level modelling. In fact, multi-level modelling is particular type of random effect model so basic principal is same (Bell & Jones, 2015)

Multi-level modelling has been developed mainly in education and psychology studies, and it is still expanding its territory so it has a very broad application. Multi-level

modelling is designed to test variables at different levels, for instance, individual characteristics and country-specific characteristics. The conventional idea of OLS does not distinguish between these two, but multi-level modelling can separate the group level effect from the individual level (Hox, 2010). In other words, multi-level modelling can be used when a lower-level entity (such as an individual) is nested within a higher-level entity (such as a country).

There are two basic models in multi-level modelling, the random intercept model and the random coefficient model. There are more applications but they are mostly derived from these two models. Let us suppose that i indicates individual (or household) and j indicates the group to which individuals belong, and that we have one dependent variable (Y) and one independent variable (X). First, the value of Y is the outcome of interest and Y consists of two parts.

$$Y_{ij} = \beta_{0j} + \varepsilon_{ij}$$

In this equation, β_{0j} is the mean of group j and ε_{ij} is individual variance that has 0 mean and σ^2 standard deviation. Namely, Y consists of group means and individual variance. However, group mean β_{0j} consists of two parts as well when each group has a different value. This is shown as

$$\beta_{0j} = \gamma_{00} + \delta_{0j}$$

In this equation, γ_{00} indicates the grand mean, in other words the mean of whole sample, and δ_{0j} indicates a group variation that has 0 mean and τ_{00} standard deviation. This helps us to see the different impact of individual level and group level. We can put those equations into one mixed model.

$$Y_{ij} = \gamma_{00} + \delta_{0j} + \varepsilon_{ij}$$

Generally, γ_{00} refers to a fixed effect, δ_{0j} and ε_{ij} refers to a random effect. On the other hand, δ_{0j} is a level-2 variance and ε_{ij} is a level-1 variance. This is called the random effects ANOVA model (or empty model, since it does not use any explanatory variable) and it is usually used as a preliminary test to check whether multi-level analysis is required or not. In other words, this model shows whether each group has unique characteristics which require us to consider them separately by showing that an individual value can be clustered around the group mean. Since the intercept of this model (β_{0j})

consists of two parts, a fixed part and a random part, it has different intercepts for each group. Some groups have a high intercept and others may have a low intercept if each group has unique characteristics. In addition, we also find what the main source of variance is by computing intra-class correlation. The standard deviation of individual level variance is σ^2, and that of group level variance is τ_{00}, so intra-class correlation can be computed as below

$$\rho = \frac{\tau_{00}}{\sigma^2 + \tau_{00}}$$

The value of ρ shows the extent to which the variance can be explained by group level difference. For example, if we say ρ=0.11, it means that 11% of the variance is due to the difference between level-2 units.

Then let us suppose we have one explanatory variable at level 1 (X) and one at level 2 (Z). First, we can plug a level-1 explanatory variable (X) into this equation as shown below.

$$Y_{ij} = \beta_{0j} + \beta_1 X_{ij} + \varepsilon_{ij}$$

where β_{1j} is the coefficient of X so it shows the relation between X and Y. Actually, at this point, we need to decide which model is going to be used, the random intercept model or the random coefficient model. If we allow a random effect only in the intercept part and assume the relation between X and Y is the same across the group, then it is the random intercept model.

$$Y_{ij} = \gamma_{00} + \delta_{0j} + \beta_1 X_{ij} + \varepsilon_{ij}$$

In this model, β_1 shows the average relationship between X and Y and it is the same across the groups. Although this coefficient is the same across the groups, it is still more rigorous than single-level analysis since this model includes the group effect. However, if there is no reason to believe that the relation between X and Y is the same across the groups, then we can allow the coefficient β_1 to vary across the groups. This is the random coefficient model.

$$Y_{ij} = \gamma_{00} + \delta_{0j} + (\gamma_{10} + \delta_{1j})X_{ij} + \varepsilon_{ij}$$

The logic is exactly same when the group level variable (Z) is put into the model.

$$Y_{ij} = \gamma_{00} + \gamma_{01}Z_j + \delta_{0j} + (\gamma_{10} + \delta_{1j})X_{ij} + \varepsilon_{ij}$$

$$Y_{ij} = (\gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}Z_j) + (\delta_{0j} + \delta_{1j}X_{ij} + \varepsilon_{ij})$$

In this model, $(\gamma_{00} + \gamma_{10}X_{ij} + \gamma_{01}Z_j)$ is the fixed part and $(\delta_{0j} + \delta_{1j}X_{ij} + \varepsilon_{ij})$ is the random part. The level-2 variable has a fixed part only but the level-1 variable has both a random part and a fixed part, so it shows us the different value for each group. What we can check is the grand mean of coefficient of X and its range according to the group characteristic. The value of Z is also more precise than in conventional regression, since it shows us the consequence when the individual level variables are controlled. In addition, it does not give us R square to check the fitness of the model. Instead, it shows deviance and that the fitness is high when the value of deviance is low. This is the basic structure and logic of the random coefficient model which is one of the most popular models for multi-level analysis.

The point of multi-level modelling is that dependent variables are affected by lower-level characteristics (such as the individual) and by higher-level characteristics (such as the country level) as well, and higher-level characteristics are different by group but the same within a group. In this study, TSCS data is treated as multi-level data so observation of a country at each year consists of a first-level variable, and country-specific characteristics consist of the second-level variable. Observations over years are nested within each country as country-specific characteristics are different by country but the same within each country.

7.3.3. Within-between country model: application of multilevel modelling

Bell and Jones (2015) argued that the weakness of the random-effect model could be overcome by careful model specification. It is therefore necessary to consider the substantive source of this endogeneity. In fact, the effect of X_{ij} consists of two parts; one reflects the difference between higher-level entities and the other reflects the difference between occasions, within higher-level entities. The coefficient from the random-effect model assumes that within- and between-country effects are equal and this can cause the so-called 'cluster confounding' problem, as well as endogeneity. In TSCS data, a change in X might have no effect on Y in one country, but it might be the opposite in another country, so it is necessary to separate the within-country effect from the between-country effect, otherwise we would have one coefficient representing an average of within- and between-country effects. This can be problematic when the within-country

and the between-country effects have very different directions. Cluster confounding refers to a situation when we fail to measure the precise estimation when the within-cluster (country in this case) effect goes in a different direction from the between-cluster effect, so the random effect model fails to give a precise estimation.

The main solution for endogeneity and cluster confounding is to separate the within-country effect and the between-country effect. Mundlak (1978) suggested including an additional term for the mean value of each time-varying variable to account for the between-country effect. The country-level mean value for time-varying variables is treated as a country-level variable. It can be simply expressed as

$$Y_{ij} = \beta_0 + \beta_1 x_{ij} + \beta_2 \bar{x}_j + (u_j + e_{ij}) \ (1)$$

where x_{ij} indicates time-varying variables and $\bar{x}_j$ indicates the mean value of x_i of country j. β_1 represents the within-country effect because the between-countries effect of x_i is controlled by $\bar{x}_j$. β_2 represents the difference between the within and between effects. This can be changed into a more straightforward formulation by using the difference between $\bar{x}_j$ and x_{ij} :

$$Y_{ij} = \beta_0 + \beta_1 (x_{ij} - \bar{x}_j) + \beta_2 \bar{x}_j + (u_j + e_{ij}) \ (2)$$

In this equation, β_1 represents the within-country effect and β_2 represents the between-country effect so interpretation of the coefficient is more straightforward (Snijders & Bosker, 2012). In addition, x_{ij} and $\bar{x}_j$ are correlated in equation (1), but this correlation is lost in equation (2) by group mean centring x_{ij} so more precise estimation is possible (Raudenbush, 1989).

This model is an application of multi-level modelling as $(x_{ij} - \bar{x}_j)$ represents the lower-level variable and $\bar{x}_j$ represents the higher-level variable as it remains the same within country but is different by countries. This model is the random intercept model, as it does not allow β_2 to vary by country.

There are several advantages in using this model. Unlike the fixed-effect model, the between-countries hypothesis can be tested using a time-invariant variable (such as the institutional design of public pension or unemployment benefit). As discussed above, the fixed-effect model treats variation between countries as a fixed effect so they can be controlled but not estimated. However, this model allows estimating the coefficient of

country-specific time-invariant variables by simply adding a country-level time-invariant variable. A second advantage is that, by separating the within-country effect from the between-countries effect, cluster confounding can be avoided and the assumption that higher-level residuals are uncorrelated with independent variables (Cov $(U_i, X_{ij})=0$) is not required any more since the group mean centred variables have a mean of 0 for each country (Bell & Jones, 2015). Consequently, the value of β_1 in equation (2) is identical with the coefficient from the fixed effect model (Mudlak, 1978) so we can get a precise estimate without sacrificing time-invariant variables through careful model specification. In addition, it is also possible to allow coefficients to vary for each country if the extended model (the random coefficient model) is used.

In fact, the number of countries could be an issue when multi-level analysis is applied to panel data. A sufficient number of higher-level entities (countries, in this case) is necessary to avoid spurious result. Multi-level modelling separates the within-country effect from the between-countries effect but the between-countries effect comes from regression based on country level. Thus, if we have twenty countries in the sample, then this means that the result is computed using only twenty observations.

There seem to be no rules of thumb but it is said that around 50 groups are necessary to get a robust result from the random coefficient model, and the random intercept model produces robust results with fewer samples than the random coefficient model (Hox, 2005). Some have argued that it is large enough if we have 30 samples (Kreft & De Leeuw, 1998). This current study has the same problem since the number of countries is around twenty.

However, Bryan and Jenkins (2013) ran a simulation analysis using data from five countries to 100 countries (they assumed that each country had a sufficient number of individuals) and estimated the relative parameter bias and standard error bias of country-level variables to find the relevant number of countries for multi-level modelling. They found that an estimation of parameter and standard error for an individual level variable is unbiased regardless of the number of countries in the random intercept model, and that the relative bias in the standard error of country-level variables was less than 2% when the number of countries exceeded fifteen, so it was negligible. In addition, the relative bias of parameter estimation is almost the same if the number of countries exceeds twenty. For the random coefficient model, they found that the relative bias was

less than 2% when the number of countries exceeded ten, and that the country level variance was underestimated but was less than 2% if the number exceeds 25.

The robustness of the modelling is sensitive to the number of independent variables. In this thesis, using the random intercept model makes it possible to estimate unbiased coefficients and standard errors since we have twenty countries in the sample. In addition, we could control more independent variables if we had more countries in the sample, but we can put only a limited number of regressors into the model in this research.

One thing that has to be considered is that the data set for this thesis is unbalanced data with missing values. A few influential units can often drive the result of regression with unbalanced data. Therefore, this thesis also employs Jackknife analysis to check any bias in the estimation. In Jackknife analysis, coefficients are estimated from the whole sample and each element is dropped from the sample in turn and coefficients are estimated from this smaller sample. Jackknife analysis is useful for obtaining unbiased predictions. The results of the Jackknife analysis are provided in the Appendix.

Consequently, this study attempted to employ various models from the fixed-effect model to the random-intercept model to see how the coefficient and significance of each variable changed according to the model specification. Time-varying variables were tested first in the fixed-effect model and the random-effect model, then the random intercept model with time-invariant contextual variables was used. Cross-level interaction variables were also employed to find how much the effect of private pensions and ALMPs differed according to the institutional design of the welfare system surrounding them.

7.3.4. Limitations of methodology

In spite of the many advantages of multi-level modelling, this study still has several limitations. This section discusses the limitations in both the methodology and the data. In fact, these two issues are closely related to each other.

The most salient limitation was from data availability. This study used time-series data based on about twenty countries over thirty years. This should produce about 600 observations but there were many missing values and that produced a very unbalanced data set. Of course, it is almost impossible to obtain perfectly balanced data for comparative social policy research at the country level, but seriously unbalanced data can

still produce some bias in estimation. Luckily, the multi-level analysis employed here was not affected by unbalanced data, and the Jackknife analysis still shows the relevance of the analysis.

However, it is still problematic, as we cannot use methods which consider the time-lag effect. It takes time to observe the effect of private pensions or particularly ALMPs on income distribution, so regression analysis which considers time lag could produce an interesting result.

There are several techniques for this, such as lagged independent variables (for example, if the dependent variable is measured at the time point T, the independent variables measured at T-1 are put into the model) and the first-difference model. However, these models cannot be used when there are many missing values as more observations will be lost. In this case, only a small number of observations remain when the first-difference model or lagged independent variables are employed, so the result is likely to be unreliable. In fact, this issue is one limitation of the methodology used in this study. It might take time to observe the policy outcomes of new policy instruments but the multi-level model cannot take account of the time effect. Therefore, the results might be different when time lag is considered, but that was not possible in this study.

In addition, it has to be noted that new policy instruments are measured as a percentage of GDP, which can be quite controversial. As explained in Chapter 4, there is a debate on how to measure the welfare effort of a country. Spending is one of most frequently used indicators, but it is necessary to keep in mind that spending reflects the size and quantity of welfare effort but not the quality. Spending on ALMPs does not include the spending in the local government and private sectors, although their role in delivering ALMPs is on the increase. As discussed above, this study employed the proportion of the elderly population and the unemployment rate to reflect the demand side of the welfare programme. As discussed in Chapter 4, this is a standardising index so we can control functional changes in expenditure level.

7.4. Research design for the thesis

7.4.1. The basic structure of the research: dependent and independent variable, and data set

As mentioned above, the aim of this research is to examine the effect of new policy instruments on income inequality, so conceptually dependent variables should be a proxy for income inequality and the independent variables should be economic and political factors, as well as an indicator of new policy instruments. In addition, the typology of the public pension system and unemployment benefit are also included as independent variables. Section 7.4.1.1 discusses the dependent variables of the model. There are various measurements of income inequality, and this section introduces the frequently used inequality measurement techniques and reviews the advantages and disadvantages of each of them. Section 7.4.1.2 introduces the bigger picture of the independent variables.

7.4.1.1. Dependent variable: How to measure income inequality?

There are many ways to measure income inequality or welfare effort so it is very important to select a relevant proxy for those variables. First, the dependent variable as a proxy of income inequality has to be determined. It is not simple task to measure income inequality properly and there is no such thing as a perfect measure.

Fields and Fei (1978) identified four conditions that are important for measuring inequality well. A brief description of these four conditions follows.

(a) *Symmetry*: This means that an inequality indicator must not be related to changes in the order of an individual's income. For instance, if the household incomes of A, B, C and D are £100, £80, £60 and £40 respectively, then income inequality should be same when the incomes of A, B, C and D are changed to £80, £100, £60 and £40. In other words, income inequality remains equal when the incomes of households A and B are switched.

(b) *Population independence*: Inequality measurement should not be affected by population size. In the example above, income inequality should remain the same when the number of households is doubled. So, if households E, F, G and H, which have incomes of £100, £80, £60 and £40 respectively, are added to households A, B, C and D, income inequality should be the same.

(c) **Scale independence**: If one income distribution is derived from another by multiplication of the constant, then the inequality between the two distributions should be the same. If we double the first distribution, then we can get another income distribution of households A to D with incomes of £200, £160, £120 and £80, respectively. In this case, the inequality index of the first income distribution should be equal to the inequality index of the second income distribution, which had doubled from the first distribution.

(d) **The Pigou-Dalton Transfer principle**: Income inequality measurement has to decrease if income is transferred from the rich to the poor, even when their rank order in the income distribution does not change.

Once the measurement of income inequality is determined, then there are several conditions that have to be decided, such as a unit of income (household or individual) or tax (pre-tax or post-tax). Details have already been discussed in Chapter 2.

There are several indices which are needed for these four conditions. One of the most frequently used is the Gini coefficient index (Atkinson & Brandolini, 2006; Milanovic, 2000). The Gini coefficient is derived from the Lorenz curve. The Lorenz curve shows a graphical representation of the relationship between the cumulative share of total income and the cumulative percentage of income receiving units (Blackwood & Lynch, 1994; Deininger & Squire 1996; Heshmati, 2004). In a Lorenz curve, the 45-degree line dividing the angle generated by the horizontal and vertical axes is the reference line. If income distribution is perfectly equal, then the Lorenz curve is identical with the reference line. On the other hand, if the income distribution is becoming unequal, the Lorenz curve moves away from the reference line.

Based on the Lorenz curve and the reference line, the Gini coefficient can be calculated as (Blackwood & Lynch, 1994).

$$G = \frac{Area\ between\ the\ Lorenz\ curve\ and\ reference\ line}{Total\ area\ between\ reference\ line\ and\ horizontal\ axis}$$

Therefore, the Gini coefficient has a value between 0 and 1, with 0 as perfect equality and 1 as perfect inequality. The Gini coefficient meets the four conditions described above and it provides general information about the income inequality of a country and makes it relatively easy to compare countries (Heshmati 2004; Deininger & Squire 1996). In

addition, data availability is also very good since international organisations such as the World Bank, IMF or OECD provide good data on the Gini coefficient.

However, there are some disadvantages of the Gini coefficient. It does not provide detailed information about the poor people who suffer most from income inequality. The Gini coefficient fails to provide details about how income distribution changes when the index goes up or down (Deininger & Squire, 1996). For example, redistribution from the top to the middle is not distinguished from redistribution from the middle to the bottom. In fact, this is a common problem with aggregated measurements (Atkinson, 1970). Graham (2002) also argued that the Gini coefficient does not capture what happens over time and within a particular society's income distribution. Two societies that have same Gini coefficient could be very different in mobility or opportunities for individuals.

The Theil index is another popular measurement of income inequality. When everyone in a society has same income, the Theil index is 0, which is perfect equality. If income distribution within the society is extremely unequal, then the Theil index is log N (N=the number of the population). The advantage of the Theil index is that it can be easily decomposed into sub-groups. Thus the Theil index shows the general situation of one country and it provides the proportion attributable to between sub-groups. The Theil index has the same problems as the Gini coefficient as it is also an aggregated index. In addition, the Theil index requires a great deal of information for computation, so data availability is relatively lower than for the Gini coefficient.

As an alternative to the Gini coefficient, the income share of a specific income bracket (usually the top 10/20% or the bottom 10/20%) is frequently adopted as a measurement of income inequality. The income share of the top 10% divided by the income share of bottom 10% is also used as a measurement to overcome the shortcomings of the Gini coefficient. In other studies, the ratio of income share between the top 20% and 80% or the top 10% and 90% has also been widely used (Caminada & Goudswaard, 2001; Roine & Vlachos, 2009; Muller, 1985). Income share or income ratio shows how income distribution is changed in a specific income class.

However, Jenkins (1991) argued that any measures based on just one of two cut-off points in income distribution, such as the income share of a specific income group (5% or 10%) or income ratio, are likely to produce irrelevant results as it is completely insensitive to income transfer over large sections of the distribution. A £10 transfer from someone

with £10,000 would be different from a £10 transfer from someone with £100, but those measures do not reflect this difference. In addition, those measures are useful when researchers are interested in changes in the income of a specific class, but generally, they do not reflect the situation of a society as a whole. The following table summarises the types of inequality measure used in frequently cited studies.

Table 7-1 Measures of income inequality

Measurement	Studies
Gini coefficient	Rudra (2004), Paskov & Dewilde (2012), Korpi & Palme (1998), Atkinson & Brandolini (2006), Scully (2003), Milanovic (2000), Forbes (2000), Deininger & Squire (1996), Benedict (2011), Crenshaw (1992), Alfonso & Schuknecht (2008), Jaumotte, Lall & Papageorgiou (2009)
Income share of middle 20%	Persson & Tabellini (1994), Alesina, Rodrik & Paukert (1973), Weede (1997)
Income share of top 20% (or 10%)	Muller (1985; 1988), Birchfield & Crepaz (1998), Weede (1980), Roine, Vlachos & Waldenstrom (2009)
Income share of bottom 20%	Weede (1980), Deininger & Squire (1996), Milanovic (1996), Fiszbein & Psacharopoulos (1995)
Income share of bottom 10%	Roine & Vlachos & Waldenstrom (2009)
P90/10 (or 80/20) ratio	Caminada & Goudswaard (2001), Alvarez (2001), Ronie, Vlachos & Waldenstrom (2009)
Household income	Haughton & Nguyen (2010), Zhong (2011) * Household income is used as a dependent variable to examine the income gap between specific groups or socio-economic classes (for example, inequality between genders or regions)

As shown in the table, the Gini coefficient is the most popular measurement of income inequality in many studies. However, many studies have used more than one measurement to produce more robust estimations since each measurement used in the previous studies has its own advantages. Many researchers have employed the Gini

coefficient as a base and the income share of a specific income class as a supplementary measurement (Deininger & Squire, 1996).

This current study employed the Gini coefficient as a proxy for income inequality due to its high accessibility. In fact, it is not easy to find other data going back to the 1980s and there are many missing values, so it is not relevant for quantitative research. In addition, as discussed above, income share measurement does not reflect the general situation of a society so the Gini coefficient is more relevant for looking at the income inequality of a whole society. For the analysis of private pensions, the Gini coefficient among the elderly population over 65 years old was employed and the Gini coefficient among the working-age population was employed for the analysis of ALMPs. There are also many missing values in the Gini coefficient among the elderly, but the number of missing values is less than in other data sets.

7.4.1.2. Description on Independent variables

The main independent variables in this study are private pensions and ALMPs. This study used spending on private pensions and spending on ALMPs as a measurement for the two variables. As shown in the previous chapter, there are advantages and disadvantages in expenditure measurement. It can measure the size of these policy instruments but it does not reflect how they are spent. However, spending is the most frequently used measurement for these two variables, and practically it looks very difficult to find alternative variables at present. Discussion of relevant measurements for private pension systems or ALMPs is definitely necessary and it is in line with measurement issue discussed in chapter 4. Expenditure-based measurement has some disadvantages, such as not reflecting the qualitative dimension or the demand side. One alternative is to use a standardising expenditure measurement as shown in Chapter 4, so for this study, the proportion of the population over 65 years old and the unemployment rate were used as independent variables. We can control the effect of functional changes in expenditure level by including those variables.

The welfare effort of other areas should also be included in the analysis as control variables. Not only ALMPs or private pensions, but also the general level of welfare effort affects income inequality. In this case, there is an issue over which one is better as a measurement of a welfare state, expenditure or generosity score. As discussed in the previous chapter, the measurement of welfare effort has to reflect qualitative

characteristics and changes in the welfare institution so it has to show the extent to which the welfare institution helps the poor cope with their situation (Scrugg & Allan, 2006; Cox, 2001). In addition, the measurement needs to be easily accessible on an annual basis (Castles, 2006).

Consequently, every model in this thesis was tested twice. The first test was the welfare generosity index introduced in the previous chapter. The generosity index indicates the extent to which existing welfare programmes are generous to the poor and reflects the extents to which the government provides the poor with generous protection. The welfare generosity index explained in the previous chapter reflects qualitative changes since it considers changes in the conditions for entitlement. Second, expenditure-based measurement was also used. The most distinctive advantage of expenditure-based measurement is its accessibility on an annual basis. In addition, many studies have used expenditure-based measurement so it is easy to compare results.

There are economic and political factors that affect income inequality, so they should be included in the analysis. Detailed lists of variables are different depending on the topic, so they are explained in each analysis chapter. Generally, GDP and degree of globalisation are included as economic variables. One thing that has to be mentioned is this study do not include variables on political institution. This study is based on data 20 countries over thirty years, but there are many missing values so we have only the limited number of observations. Therefore, the number of independent variable has to be limited otherwise it could reduce robustness of the analysis. In addition, data for political institution, such as veto points or corruption has limited availability. Therefore, this study does not include variables on political institution.

For this analysis, data were collected from various sources. Data on social expenditure, private pensions and ALMPs were taken from OECD data sets. The Gini coefficient among the elderly and working-age populations were also taken from OECD data sets. Economic variables such as GDP per capita or the globalisation index were also taken from the OECD, and the generosity scores of the welfare state came from Scruggs's (2013) data set. Other data were drawn from comparative welfare state data sets made by Brady, Huber and Stephens (2014). Detailed descriptions of the variables are explained in each analysis chapter.

7.4.2. Hypotheses of analysis.

This chapter is intended to show only the 'big picture' of the thesis, so this section briefly introduces the basic hypotheses which will be explained, tested and discussed in much more detail within their respective analysis chapters. This thesis focuses on how much difference is made by the institutional design of public welfare systems in the effect of new policy instruments on income inequality. Hypotheses A refers to the effect of private pensions and the institutional design of a public pension system, and hypotheses B are about the effect of ALMPs.

Hypothesis A

An increase in private pension has significant effect on income inequality.

Hypothesis A-1

An increase in private pension does not have a significant effect in countries with a generous public pension system.

Hypothesis A-2

An increase in private pension has a significant positive effect on income inequality in countries with a less generous public pension system.

Hypothesis B

An increase in ALMPs has a significant negative effect on income inequality.

Hypothesis B-1

An increase in ALMPs has a stronger negative effect on income inequality when unemployment benefit and the minimum income programme are less generous.

Hypothesis B-2

An increase in private pension has a weaker negative effect when unemployment benefits and the minimum income programme are more generous.

In fact, the effect of ALMPs and private pensions is an explorable hypothesis as previous empirical studies have shown that the effect of these policies is not very clear. This study tentatively assumes hypotheses A and B. The subordinate hypotheses are based on studies which have examined the relationship between new policy instruments and public

welfare systems. As shown in the previous section, individuals do not have an incentive to join a private pension scheme when the public pension provides sufficient benefit, so hypotheses A-1 and A-2 are based on this. Regarding unemployment benefit, individuals can remain longer in unemployment when the unemployment benefit and minimum income programme are generous, and they do not have an incentive to join any active labour market programmes. Hypotheses B-1 and B-2 are derived from this. The detailed hypotheses from hypothesis A will be explored in Chapters 8 and 9, and those from hypothesis B will be explored in Chapter 10.

The meaning of 'generous' benefit is still very vague; it will be specified in the analysis chapter when the institutional design of the public welfare system is classified. The 'generosity' of a welfare system in this thesis is much related to the discussion of the universal and targeting systems in Chapter 4. In this thesis, 'more generous system' means that the welfare system contains characteristics of a universal system, and 'less generous system' indicates that the welfare system is more close to a targeting system.

7.5. Conclusion

The reduction in income inequality and poverty is one of the main objectives of social policy. In order to reduce income inequality and have a better shape of income distribution in the era of transformation of the welfare state, it is necessary to determine how new policy instruments affect income inequality. An aging population and the fiscal burden on governments led to the reform of the public pension programme and an increase in private pensions, and the transition from the protective welfare state to the productive welfare state is closely related to the emergence of ALMPs. However, the effect of these new policy instruments is determined in the interplay with the traditional public welfare system.

Therefore, this thesis attempts to examine the distributive outcome of new policy instruments in the context of the institutional design of the traditional welfare state and this chapter has offered a big picture of the research design and methodology used. TSCS data is frequently used in comparative welfare state research and it overcomes the 'small N issue' which is often mentioned as a problem in TSCS data at country level. However, it also has some problems, such as auto-correlation and omitted variable bias. The fixed-effect model is useful as it can control unobservable heterogeneity between countries,

but it can also lose a lot of information as it treats time-invariant variables as fixed effects, so we cannot test it. The institutional design of a welfare programme is time-invariant or changes very slowly over time, so it cannot be estimated by the fixed-effect model. The random-effect model can be an alternative to the fixed-effect model but its estimation can be spurious as it is based on unrealistic assumptions.

Therefore, this thesis employed multi-level modelling which can separate the within-country effect and the between-countries effect. It is possible to estimate the effect of the time-invariant institution, as well as private pensions and ALMPs using this model, controlling other country-specific characteristics. The Gini coefficients among the elderly and working-age populations are used as dependent variables, and spending on private pensions and ALMPs is employed as a main independent variable. Other variables that can affect income inequality, such as welfare effort, economic and political variables, are also included as control variables. The institutional design of public pension and unemployment benefit/minimum income programmes is specified in more detail in the following chapter.

Chapters 8 and 9 deal with the effect of private pensions on income distribution. Chapter 8 shows more detailed research questions, hypotheses and classifications of the public pension system. This will show how to classify public pension systems based on eligibility and earning-relatedness which are known to be important factors which affect private pensions. More detailed introductions to variables and descriptive statistics are also shown. Chapter 8 mainly focuses on how an increase in private pensions is related to changes in income distribution and how this relation can be changed by the institutional design of public pensions. Chapter 9 is a supplementary analysis to Chapter 8. It covers the distributive outcome of first-tier pensions and second-tier pensions, and how they interact with private pensions. Chapter 10 deals with the distributive outcome of ALMPs. The classification of unemployment benefit and minimum income programmes is explained in Chapter 10, and descriptive statistics and the result of the analysis are presented.

Chapter 8. Distributive outcome of private pension part 1

8.1. Introduction

As discussed in the previous chapter, income inequality is the consequence of complicated interactions between various factors in society, not only economic factors and political issues, but also demographic changes and welfare reform are considered as two of the main factors in changes in income distribution. In particular, an aging population and changes in family formation are regarded as important factors and are closely related to the reform of the welfare state. The reform of the welfare state is needed to build a more efficient and sustainable welfare system under the fiscal burdens that governments face, so new policy instruments are needed for reform. Therefore, the empirical analysis in this thesis explores the relationship between new policy instruments and income inequality focusing on the interaction between new policy instruments and the existing traditional welfare state. First, this chapter concentrates on private pensions and income inequality. As was shown in the previous chapter, the modern welfare state is under fiscal pressure caused by an aging population and increases in pension expenditure, so many policy reforms are attempted in the pension programme as well as the labour market policy to cope with an aging population.

As was shown in Chapter 6, one of main new policy instruments is the introduction of private pensions so this chapter looks at how pension reform is related to income inequality controlling other main factors, such as economic development, globalisation and political characteristics. The goal of this chapter is first to look at the empirical relationship between private pensions and income inequality. Second, as stated in Chapter 7, the relationship is expected to be affected by the institutional design of a public pension programme, so this chapter will looks at how the relationship differs according to the institutional design of the public pension system. The institutional design of pension systems is classified based on the debate between a universal system and a targeted system, but criteria that are more detailed are applied to classification.

This chapter is structured as follows. It discusses how to classify welfare institution in this chapter is structured as follows. It discusses how to classify welfare institutions in the public pension system first. This starts with a discussion of the existing classifications and what criteria they are based on. As shown in Chapter 6, previous studies have shown that

earnings-relatedness and eligibility are important for the relationship between private pension and public pension systems. In addition, eligibility is closely related to the debate between the universal system and the targeted system. Therefore, this chapter proposes a classification based on earnings-relatedness and eligibility. Specific research questions and hypotheses are also proposed.

The following section introduces the dependent and independent variables. A brief description has already been given in Chapter 7 so further details of the list are given in this section. Descriptive statistics of the main variables follow. The trends of the main variables over time are shown first, and a simple analysis of variance (ANOVA) is carried out to see whether or not there is a significant difference in income inequality between types of pension institution. The results of the empirical analysis are presented after the descriptive statistics.

8.2. Research questions, design, and hypotheses

This section discusses how to classify the institutional design of public pension systems. It reviews Beveridge-type and Bismarck-type systems and then looks at the classification proposed by Korpi and Palme (1998; 2006). Their classification is based on earnings-relatedness and eligibility so it covers salient factors in the relationship between private and public pensions, as well as discussions of the universal and targeted systems. This section proposes a new classification based on Korpi and Palme's classification but using some empirical data on earnings-relatedness and coverage rate. Specific hypotheses based on the theoretical discussion of the relationship between public and private pensions are then presented.

8.2.1. Institutional design of public pension: The Bismarck model vs The Beveridge model

The primary purpose of this thesis is to look at the distributive outcome of new policy instruments, which in this chapter is a private pension scheme, and to see how the distributive outcome can differ according to the institutional design of the public pension programme. The important question is therefore how to measure and classify the institutional design of public pension systems. As explained in Chapter 7, the main components considered are the earnings-relatedness of a pension and its eligibility criteria (Korpi & Palme 1998; Palme 2006). The conventional idea of classification by type

of public pension is the Bismarck-style and the Beveridge-style (Disney 2004; OECD 2007). The Bismarck-style is pension system which provides earnings replacement so there is a strong link between earnings during working age and pension income. Thus, the Bismarck-style system is based on social insurance and has earnings-related benefits. Entitlement is generally based on contribution record. Most continental European countries, such as Germany and France, have a Bismarck-style pension system. In contrast, the Beveridge-style system is more concentrated on basic security, rather than earnings replacement, so a flat-rate benefit unrelated to contributions is provided. Eligibility is mostly based on residence and in some case on need (Bonoli 1997; Queisser *et al*., 2007).

However, the details are slightly different in different countries; the Netherlands and New Zealand have income-tested and flat-rate benefits systems whereas Canada and Ireland have a combination of the flat-rate and earnings-related benefit systems (Disney 2004). The Beveridge-style system can be found in Anglo-Saxon countries and some continental European countries such as the Netherlands and Switzerland. It is said that Beveridge regimes are typically accompanied by a private pension scheme as they mainly provide a flat-rate benefit so the rich have an incentive to buy a private pension to maintain their previous income level. Thus, the coverage rate of private pensions in a Beveridge regime is likely to be high, so it can be inferred that private pensions have a more significant negative effect on income distribution in Beveridge-regime countries. This is in line with Palme's argument (2006) as discussed in Chapter 7. The argument is that a private pension has a significantly negative effect on income distribution in countries with more 'equal' structure, but the Bismarck regime is a more 'unequal' structure than Beveridge's as it has stronger earnings-relatedness so the effect of private pensions is likely to be insignificant in Bismarck-style systems.

Table 8-1 Beveridge regime & Bismarck Regime (Disney, 2004)

	Countries	Pension Scheme type		Benefit level (%) (replacement rate standard pension)
		1st tier	2nd tier	
Beveridge Regime	Australia	Targeted	Private DC	46.9
	Canada	Targeted/Basic	Public DB	69.9
	Denmark	Targeted/Basic	Private DC	62.84
	Ireland	Basic	-	57.93
	Netherlands	Basic	Private DB	60.29
	New Zealand	Basic	-	59.77
	Switzerland	Targeted/Minimum	Public DB/Private DB	56.74

	UK	Targeted/Minimum/Basic	Public DB	55.96
	US	-	Public DB	76.66
	Average value of benefit level			**60.77**
Bismarck Regime	Austria	-	Public DB	65.23
	Belgium	Targeted/Minimum	Public DB	65.72
	Finland	Minimum	Public DB	75.51
	France	Minimum	Public DB+Points	64.32
	Germany	Targeted	Points	57.70
	Greece	Minimum	Public DB	-
	Italy	Targeted	Public NDC	79.03
	Luxemburg	Targeted/Basic/Minimum	Public DB	-
	Norway	Minimum	Public NDC/Private DC	63.7
	Portugal	Minimum	Public DB	66.20
	Spain	Minimum	Public DB	98.09
	Sweden	Minimum	Public NDC/Private DC	90.02
	Average value of benefit level			**72.55**

<Sources: Disney's classification (2004), replacement rates are taken from Comparative welfare entitlement data set (Scrugg, 2013)

Specification of the pension scheme follows the OECD pension-at-a-glance (2013). As shown in Chapter 7, the public pension system has a basic security dimension and income security dimension so usually, the public pension system consists of a two-tier system. The first tier usually reflects redistributive components (basic security) to ensure that pensioners can achieve a minimum standard of living (Queisser *et al.*, 2007) and it is not related to previous income level, whereas the second tier programme focuses on the savings or insurance aspects of the public pension (income security) as it is the earnings-related part. What we can find here is that Beveridge-regime countries are likely to have targeted or basic pensions as the first tier programme whereas most Bismarck-regime countries have a minimum pension.

'Basic pension' refers to a flat-rate benefit or benefit depending on years of work, not past earnings (OECD, 2013). 'Minimum pension' in this table is slightly different as governments offer benefit to individuals who have lower pension income than the minimum standard set by the government. It looks similar to means-testing but is different as it is not affected by other income, such as savings (OECD, 2013). Thus, minimum pension is in the middle between basic pension and targeted pension. For the second tier programme, some Beveridge-regime countries have a private pension scheme only, whereas all of the Bismarck-regimes countries are based on a public pension system, although some of them have a mixture of private and public schemes. Regarding benefit

level, the table shows the replacement rate of a standard pension, which is based on contributions and is earnings-related. Although most Beveridge-regime countries (New Zealand and Ireland do not have an earnings-related pension system as they have basic pension system only) have an earnings-related element in the pension scheme, their benefit level, which is 60.77% on average, is relatively low compared with Bismarck-regime countries which show 72.55% (Greece and Luxemburg do not have data in Scruggs's data set). Based on previous studies of the effect of private pensions and the institutional design of public pensions, the following hypotheses can be proposed. All the hypotheses in this chapter have been developed from hypothesis A in Chapter 7.

Hypothesis 1: An increase in private pensions is related to an increase in income inequality under the control of other independent variables.

Hypothesis 1-1: An increase in private pensions is not significantly related to an increase in income inequality in Bismarck-regime countries.

Hypothesis 1-2: An increase in private pensions is related to an increase in income inequality in Beveridge-regime countries.

Hypotheses 1-1 and 1-2 are very straightforward. In previous studies, it has been argued that a private pension does not play a significant role in the pension programme in countries with strong earnings-relatedness based on contribution, whereas the opposite is expected in countries with a universal flat-rate benefit. In fact, this has been frequently discussed in previous studies which have shown that a generous public pension crowds out private pensions (Künemund & Rein 1999; De Deken, 2013). It can therefore be inferred that a private pension is unlikely to affect income distribution in a Bismarck regime which has an earnings-related benefit, and that a Beveridge regime is likely to have contrary consequences, as the Beveridge regime is concentrated on the universal flat-rate and its earnings-relatedness is relatively weaker than in the Bismarck regime. Thus a private pension is more attractive for the rich in Beveridge-regime countries, so income inequality can get worse when the rich are likely to join private pension programmes.

8.2.2 Institutional design: earning-relatedness and coverage

Apart from the classification on the lines of Bismarck-Beveridge regimes, this study attempts to propose a different classification based on empirical data on earnings-relatedness and eligibility. As shown in previous section, the pension program can be divided into Bismarck and Beveridge model. However there are difference between Continental European countries and Scandinavian countries although they are included as Bismarck model (Korpi & Palme, 1998). Therefore, they proposed the classification based on earning-relatedness and eligibility, and elaborated and empirically tested in subsequent studies (Palme, 2006). They argued that there are two main issues on the best policy design to reduce poverty and inequality (Korpi & Palme 1998). One is whether the social policy should be universal or targeted, and the second is whether it should be related to previous earnings or should be equal for all. In fact, this issue has been repeated in previous studies as the debate on the 'paradox of redistribution'. As reviewed in Chapter 6, the core question on this is whether the middle class should be included in the welfare programme. They therefore proposed an institutional design for a welfare state based on these two questions.

This section attempts to employ the basic idea of this model and re-classify it based on empirical data. First, the degree of earnings-relatedness is computed. In this study, the degree of earning-relatedness is measured by the net replacement rate by earning level. The replacement rate for a high income is normally lower than for a low income and the gap in the replacement rate between the rich and the poor tends to be bigger when earnings-relatedness is weak. For instance, New Zealand has only a flat-rate basic pension system and the replacement rate for the poor is around 81.7% but for rich it is 23.9% (OECD, 2013). Table 8-2 shows the net replacement rates for people at different earnings levels: half, average and double average earnings.

Table 8-2 Replacement rate by earning level in 2013

	0.5	1	2	Gap between high and low income
Australia	100.5	67.7	55.6	44.9
Austria	91.2	89.9	64.5	26.7
Belgium	80.7	63.9	35.4	45.3
Canada	90.7	64.4	32.0	58.7

Denmark	117.5	82.4	60.5	57
Finland	71.3	62.4	62.2	9.1
France	71.3	62.4	63.2	8.1
Germany	57.8	55.2	42.6	15.2
Greece	92.5	79.6	61.2	31.3
Ireland	75.5	52.2	28.2	47.3
Italy	83.9	82.0	82.6	1.3
Luxemburg	87.1	70.5	63.6	23.5
Netherlands	104.8	103.8	94.9	9.9
New Zealand	81.7	57.7	23.9	57.8
Norway	91.1	63.8	42.5	48.6
Portugal	77.7	65.6	69.6	8.1
Spain	79.5	79.8	63.9	15.6
Sweden	68.8	55.3	79.1	-10.3
Switzerland	78.4	77.8	37.3	41.1
United Kingdom	67.2	48	23.9	43.3
United State	58.7	49.9	37.1	21.6
Average	82.3	68.3	53.51	

<Sources: OECD pension at glance, 2013>

The data shown in Table 8-2 are from the year 2013, but the degree of earnings-relatedness cannot be judged by only one-year data so it is necessary to see a trend of earnings-relatedness in public pensions. This study used data from the 'OECD pension-at-a-glance' from 2005 to 2013. The trend is summarized in the following table.

Table 8-3 Trend of earning-relatedness

	2005	2007	2009	2011	2013	Average
Denmark	60.1	60.5	59.3	58.6	57	59.1
Canada	58.8	58.4	58.2	57.6	58.7	58.34
New Zealand	55.1	58.2	56.5	56.4	57.8	56.8
United Kingdom	48.6	42.1	41	43.6	43.3	43.72
Ireland	41.1	42.3	44	39.6	47.3	42.86
Australia	40.5	42.7	43.4	40.5	44.9	42.4
Belgium	42.1	36.6	37.5	40.4	45.3	40.38
Switzerland	30	39.9	35.4	43.1	41.1	37.9
Norway	35.4	22	23.9	38.8	48.6	33.74
Austria	11.9	25.3	25.7	27.6	26.7	23.44

United State	22.4	24.2	24.6	23.5	21.6	23.26
France	28.9	23	18.7	20.4	8.1	19.82
Luxemburg	20.8	16.6	15.3	14.1	23.5	18.06
Greece	0	6.6	9.4	9.4	31.3	11.34
Spain	5.3	9.6	9.9	12.1	15.6	10.5
Portugal	29.6	7.9	0.6	2.8	8.1	9.8
Finland	12.4	5.9	8.7	6.9	9.1	8.6
Germany	-5.3	1.1	14.8	12.2	15.2	7.6
Netherlands	-1.3	2.2	9.5	10.9	9.9	6.24
Italy	0.2	0.8	-3.9	1.5	1.3	-0.02
Sweden	15.9	7.5	-6.6	-11.3	-10.3	-0.96

<Source: OECE pension at glance 2005-2013>

Table 8-3 shows the trend of the gap in replacement rate between the rich and the poor. Earnings-relatedness gets weaker as the gap increases. As shown in the table, the distinction between strong earnings-relatedness and weak earnings-relatedness is relatively clear as most of the countries can be seen to have been stable over this period except for a few cases. The average value of the gap in total is 26.33. Most countries have stayed either below or above this average value. There are some exceptions, for example, Sweden shows a steep line of decrease but this does not matter in practical terms as Sweden shows a consistently low level of the gap (strong earnings-relatedness). For Sweden, the gap has had a negative value since 2009 which means that the replacement rate for the rich is higher than the replacement rate for the poor.

In fact, the countries that are more problematic are Norway and Greece. For Norway, the gap was higher than 30 in 2005 but it went down below 30 in 2007 and 2009, and then went up again. Although there are some fluctuations, the average value of the gap in Norway is above 26.33 and is on the increase, so Norway is considered as a weak earnings-relatedness country in this study. In contrast, Greece had strong earnings-relatedness until 2011 but then had weak earnings-relatedness in 2013. In the context of this study, Greece was considered to be a country with weak earnings-relatedness based on the most recent data, but in fact, all the results still remain the same when Greece is considered as a strong earnings-relatedness country. Table 8-4 shows a list of the countries in each category.

Table 8-4 Classification based on earning-relatedness

Strong earning relatedness	Weak earning relatedness
Austria(M) ,Finland(M), France(M), Germany(M), Italy(M), Luxemburg(M), Netherlands(V), Portugal(M) , Spain(M), Sweden (M), USA(V)	Australia (v), Belgium(M), Canada (V) Denmark(V), Greece(M), Ireland(V), New Zealand(V), Norway (M), Switzerland (V), UK(V)

*M: Bismarck Regime, V: Beveridge regime

As expected, most of the Bismarck-regime countries have strong earnings-relatedness and the Beveridge-regime countries have weak earnings-relatedness. There are some exceptions: the Netherlands and the US are classified as Beveridge regimes but their earnings- relatedness is relatively strong. The case of the Netherlands could be plausible as the Netherlands can be classified as a Bismarck regime by some researchers. The US is a bit different; its earnings-relatedness is slightly stronger than the average but its benefit level is low compared with other countries. Denmark is the opposite case as the gap is relatively large but the benefit level is relatively high in all earnings levels. The case of Greece is similar; its benefit level is relatively higher than other countries with weak earnings-relatedness but the gap between high and low incomes (31.3) is slightly higher than the average (28.77). This calculation and classification are based on the data from the OECD in 2013. However, the degree of earnings-relatedness does not frequently change so this classification is still valid.

Countries with low earnings-relatedness pension systems are likely to have high coverage rates as most of them are based on the universal basic security system. In contrast, the coverage rate in the countries with strong earning-relatedness pensions is more varied. Korpi and Palme (1998) showed the difference in eligibility across countries that had strong earnings-relatedness. They showed that continental European countries are based on an occupational pension system and that Nordic countries have universal eligibility with strong earnings-relatedness. As shown above, universalism is considered to be a significant factor affecting income distribution so this current study calculated the average coverage rate of each country for thirty years using the coverage rate data proposed by Scruggs (2013). As shown above, the public pension system has a two-tier system so the coverage of each tier of the programme might be different. However, this thesis approaches this in a broader sense so eligibility is based on how many people in the society are covered by the public pension. The coverage rate shown in Scruggs's data is

computed as the number of benefits paid to the population above retirement age. Therefore, this thesis selected coverage rate as an indicator for eligibility for a public pension.

Regarding eligibility, this study uses the mean value of the coverage rate of public pension system. All data are taken from Comparative welfare entitlement dataset by Scruggs (2013).

Table 8-5 Coverage rate from 1980-2010

country	coverage rate	country	coverage rate
Netherlands	1.031667	New Zealand	0.9625
Sweden	1.025217	Ireland	0.9612903
United Kingdom	1.016207	Germany	0.96
Norway	1.014063	USA	0.9433333
Finland	1.006667	Belgium	0.9295833
Switzerland	1	Austria	0.8569565
France	1	Australia	0.7185807
Denmark	0.996	Portugal	0.68
Canada	0.9877419	Spain	0.61
Italia	0.97625	Greece	N/A

<Sources: Comparative welfare state entitlement, http://cwed2.org/)

As we can see in the table, Austria, Australia, Portugal and Spain have distinctively lower level of coverage rate but the other countries generally have the high level of coverage rate. Among strong earning-relatedness countries, Germany and USA have relatively lower level of coverage rate compared to Netherlands, Sweden, Finland and France. Among weak earning-related countries, most of countries have relative high level of coverage except Australia.

Countries with strong earnings-relatedness are divided into 'low coverage' and 'high coverage' based on the average value across the countries. Countries with weak earning-related, they are treated as one group although Australia have lower level of coverage rate. Australia is the only one country that have weak earning-relatedness and low coverage rate. However, it is usually classified as same group with other Anglo-Saxon

countries (Esping-Andersen 1990; Antonius & John, 2002), so this study put Australia into the same group with other Anglo-Saxon countries.

It needs more cautious to deal with Luxemburg and Greece as they do not have available data. Luxemburg is often classified as same group with Germany or Austria (Antonius & John, 2002), so it is included in low coverage group. As shown in above, weak earning-related group is treated as one group although there are some variability in coverage rate. However it is still valid as they are generally high level of coverage rate. As a consequence, the countries in each group are summarized the following table. As discussed above, the core characteristics of public pension system in terms of income distribution is earning-relatedness and coverage rate. Thus, this study employs two dimensions only to classify the institutional design of public pension. Other characteristics such as qualifying period, thus, are not reflected in this study.

Table 8-6 classification based on earning-relatedness and coverage

Weak earning-relatedness	Strong earning-relatedness	
	Low coverage	*High Coverage*
Australia, Belgium, Canada, Denmark, Greece, Ireland, New Zealand, Norway, Switzerland, United Kingdom	Portugal, Spain, USA, Austria, Germany, Luxemburg	Finland, France, Sweden, Netherlands

According to previous studies, strong earnings-relatedness based on universal coverage makes a private pension less attractive so private pensions do not have a significant effect on income inequality. In contrast, a weak earnings-relatedness pension system encourages the rich to join private pension schemes so income inequality is expected to increase as private pension spending increases. This is a bit complicated to predict in the case of strong earnings-relatedness but a low coverage rate, but it is nevertheless expected that a private pension does not have a significant effect if earnings-relatedness is a more important aspect in income distribution. However, if a public pension system has strong earnings-relatedness but is accessible only to a limited group of people and the excluded class is likely to be poor, then only those in the rich class can access a private pension on the top of the public pension and in this case an increase in private pensions is

related to an increase in income inequality. In brief, this study proposes the following hypotheses.

Hypothesis 2

An increase in private pensions has significant effect on an increase in income inequality in countries with a weak earnings-relatedness pension scheme.

Hypothesis 3

An increase in private pensions does not have significant effect on changes in income inequality in countries with strong earnings-relatedness and a high coverage rate.

Hypothesis 4

An increase of private pensions does not have significant effect on the increase of income inequality with strong earnings-relatedness but a low coverage rate if the strong earning-relatedness is more decisive than universal coverage in the low level of income inequality.

Most of the developed countries are finding that they have an aging population. However, the welfare effort of the welfare state including a pension system is declining due to fiscal deficits and low economic growth. The direction of current reform in pension systems is to adopt a public-private mixed programme, decrease the importance of the public pension and delay the retirement of workers. These changes could help governments to budget more sustainably, but we need to consider their distributive consequences. Previous studies have shown that the changes from public pension to private pension in the developed world are causing the elderly to have less benefit and to be more exposed to economic shock from outside the country as private pension companies can invest in other countries in order to gain a better return, so their profits can be affected by global shocks such as financial crises. Pensioners' benefits from private pensions can be affected when private pension companies are affected by global shock (Bonoli & Natali, 2012). Therefore, it is expected that there will be more poverty and inequality in our society as the proportion of private pensions increases. This is why we need to examine the relationship between pension reform and its distributive outcome. The next section offers detailed information on the variables, data and methodologies for the model required to test the hypotheses proposed above.

8.3. Data, Variable and Methodology

As shown in Chapter 7, this thesis focuses on how an increase in private pensions is related to changes in income inequality in the context of the existing pension programme. Therefore, the dependent variable is income inequality and main independent variables are private pensions, the index of welfare effort and an aging population. However, as discussed in the previous chapter, many drivers affect income inequality. The main drivers are divided into three categories, political, economic and welfare institution variables. The welfare institution can be measured by welfare effort as the main independent variable, and economic variables and political variables are included as control variables. A detailed explanation follows.

8.3.1. Independent variables and controlled variables

8.3.1.1. Main independent variables

A main independent variable can be categorized into two parts. The first is to indicate the reform of the pension programme, and the other is to measure welfare effort, particularly on the pension programme. As shown above, the main strategy of pension reform is to postpone the retirement age and increase the mixed private-public system. In the first category, the labour participation rate of the elderly (over 65 years) and the relative size of voluntary private pension expenditure are included as variables. Both were obtained from OECD social expenditure data sets and the relative size of voluntary pension expenditure was computed by private pension expenditure as a percentage of public (and mandatory private) pension expenditure. Both forms of data cover around thirty years from 1980 to 2011.

The other category is welfare effort focusing on the pension programme. The method for measuring the welfare effort was discussed in the previous chapter. To summarize, the most frequently used measurement is social expenditure (Castles, 1999; 2004; 2008) since availability and accessibility are relatively better than other indices and are very straightforward to understand. However, social expenditure reflects financial terms only so it is criticized for neglecting qualitative changes in welfare effort. It does not tell us how money is spent and does not consider changes on the demand side. In addition, studies of changes in the welfare state using expenditure measurement have shown inconsistent findings (Wenzelburger, 2013; Kühner 2007; 2015).

Thanks to improvements in statistical methods and information processing techniques, welfare generosity which is now measured based on social rights is broadly available and it enables us to see qualitative changes in the welfare state over time and space as well (Scruggs & Allan, 2004; 2006). Although the data for social rights-based measurement are not easy to obtain and to update, it is getting better and better as time goes by. The detailed method for calculating welfare generosity has already been explained in the previous chapter so it does not have to be recapped in this section.

Another issue for measuring welfare effort is to select either summary measures or specific measures for each welfare programme. As mentioned above, not only pension programmes but also health-care or long-term care expenditure is expected to play an important role in income distribution. Some previous studies have focused on measurement of a specific programme when they examine the relationship between income distribution and welfare effort (Palme 2006). It has also been argued that we need to be more programme-specific when evaluating welfare effort since disaggregated data is better for capturing changes in the welfare policy of countries as the diversity of welfare policy is getting wider (Kühner 2007). In addition, the politics and changes in pension programmes are different in different welfare areas so a pension programme might have a different direction from unemployment benefit or sick pay and summary measurements are unlikely to capture the difference.

Therefore, this study employs a general welfare generosity score as a measurement of welfare effort. The generosity score can be divided into two parts, pension generosity score and the generosity score of other programmes. In addition, it is important to capture data from as many countries as possible. As discussed in Chapter 7, multi-level analysis requires many samples at the country level. Generosity scores are available for nineteen countries whereas social expenditure is available for only eighteen countries. Thus, we can capture more countries when we use a generosity score.

As discussed in Chapter 5, the pension generosity index proposed by Scruggs (2013) consists of three factors; the replacement rate (RR) of the minimum pension, the RR of the standard pension and the coverage rate of the public pension. The welfare generosity score is used to test hypotheses 1 to 5. However, as discussed in Chapter 5, welfare generosity is not a perfect index so all the models in this chapter were re-tested using

expenditure-based measurement as well. The results are available in the appendix A.3 and A.4.

Institutional variables which reflect time-invariant, country-specific characteristics are included as well. In this study, 'context variable' refers to the institution of the country in which the welfare effort is embedded, so it affects every variable within one country. Those context variables are similar to country dummy variables to absorb country-specific effects which are unobservable. However, context variables in this study are for reflecting the institutional design of the public pension programme and they can be captured, whereas country dummy variables are only for being controlled to strip off the effect of the unobservable variables. This study has two context variables. As stated above, the Bismarck and Beveridge regimes are used first. Then a classification based on the degree of earnings-relatedness is applied. As shown above, there are some countries that are not very clear. Thus the classification shown in the previous section is applied first and then some changes are applied.

8.3.1.2. Control variables

Regarding control variables, important variables which affect income inequality are divided into political, economic and social variables. So this study also selects variables based on previous studies. First, an aging population should be considered as a social variable because social expenditure can be driven by an aging population without qualitative changes. This study uses the proportion of the population over 65 years old as a measurement for an aging population. The data were obtained from OECD demographic statistics. At the same time, including the proportion of the population over 65 is important as it controls the demand side of the welfare state. As discussed in Chapter 4, expenditure measurement carries several problems and one way to overcome its disadvantages is to standardise the expenditure measurement that reflects the demand side of social expenditure. This study employs spending on private pensions as a measure so we can control the effect of functional changes in expenditure by including this variable.

GDP per capita and the openness of the capital market are considered to represent the economic dimension. Economic variables have been regarded as the most salient factor in income distribution and the level of economic development is an important factor in income inequality. In fact, some studies have used economic growth rate as an economic

variable but Kuznets (1955) insisted that it is not the relationship between economic growth and income inequality but the level of economic development and income inequality that is relevant. The basic structure of his argument was that income inequality increases in the early stage of economic development and is reduced as the economic system and the labour market become mature. Thus the level of economic development is well reflected in GDP per capita, rather than in the economic growth rate. We can see from the data that the economic growth rate is relatively low in high-income countries and higher in middle-income or low-income countries. That is why this study used GDP per capita rather than the economic growth rate as a variable.

Another index for the economic aspect is the openness of the capital market. As shown in the previous chapter, globalisation is regarded as an important factor in income inequality as well as in welfare reform. Trade openness is commonly used as an indicator to measure the degree of globalisation (Dreher, 2008; Jesper & Roine, 2009) but the openness of the financial market is used in this current study. This is because financial openness is likely to be more directly associated with pensioners' income as the privatisation and financialization of the pension system become more intensified. This study employed the financial openness index (KAOPEN) established by Chinn and Hiro (2008). This index contains four main indicators of financial openness: the presence of multiple exchanges rates, restrictions on current account transactions, restrictions on capital account transactions and the requirement for the surrender of export proceeds. This index measures the intensity of capital controls, and a higher value indicates a high level of financial openness.

8.3.1.3. Dependent variable

Regarding the dependent variable, the Gini index was used as a measurement for income inequality. There are many measurements for income inequality and each one has its own advantages and disadvantages as explained in the previous chapter. The Gini coefficient is quite straightforward to understand and can be easily obtained so it is considered as a dependent variable in the analysis offered later. For this study, Gini coefficients were taken from OECD data sets of income distribution. The Gini index for the old-age population is employed as a dependent variable so we can find the more specific effect of an independent variable focusing on the old-age population.

Apart from the Gini coefficient, all the other data were taken from the *Comparative welfare state data set, 2014* established by David Brady, Evelyne Huber and John D. Stephens. They assembled this data set using original data mainly from OECD and ILO data, and it contains data on income distribution, social expenditure, general economic data (from OECD), welfare generosity (from Scruggs and Allan), political institution and demographical changes of 22 countries, roughly from 1960 to 2011. This study used data from nineteen countries (leaving out Japan, Luxembourg and New Zealand) for the thirty years from 1980 to 2010. The welfare institution in Japan has developed in a different political and economic context from western countries, so it is not relevant to put all of them together. Welfare generosity scores for Luxembourg and data on private pensions for New Zealand do not exist, so these two countries were excluded from the analysis carried out in this chapter.

There are many missing values before 1980, so this study focuses on data from 1980. In addition, the crisis of welfare states became obvious from the 1980s and it is regarded that welfare states entered into times of permanent austerity from the 1980s onwards (Wenzelburger, 2013). However, there are still missing values particularly in Gini coefficients and this can be problematic as a missing value in Gini coefficients can lead to having to delete whole cases. There are various techniques for filling the missing values using existing data, but this study just focused on the original data sets. Values produced by those techniques are hypothetical and could distort the results. The numbers of inclusion for each country are shown in Table 8-7. This was expected to show the relationship between income inequality and pension reform in the era of transformation in the welfare state. All the variables in this study were summarized in Table 8-6.

Table 8-7 shows a number of inclusions for each country. From that table, we can see that this data set is seriously unbalanced, which is likely to generate bias: the result could be distorted by countries with large numbers of inclusions. That is one reason why multi-level modelling is used for analysis as it is not affected by the number of observations in each group, so unbalanced data do not make a difference in multi-level modelling. As stated in the methodology chapter, this study employed Jackknife analysis to check whether the result can be changed by one group (country, in this research), but Jackknife analysis shows that it does not make any difference. The results of the Jackknife analysis are available in the appendix A-5 and A-6

Table 8-7 List of variables

	Dimension	Variable	Sources
Dependent variable		Gini Coefficient for Old age population	OECD (1980 to 2011)
Independent variable (time-variant)	Pension reform	Labour market participation rate of the elderly	OECD (1980 to 2011)
		Relative size of private pension expenditure	OECD (1980 to 2011) Missing: New Zealand
	Sociological changes	The share of elderly (over 65 years) among population	CWS (1980 to 2011)
	Economic	Real GDP per capita	OECD (1980 to 2011)
		Openness of capital market	CWS(1980 to 2011)
	Welfare effort	Welfare generosity (unemployment benefit, pension, sick pay)	Scruggs & Allan (1980 to 2011) Missing: Luxemburg
		Welfare generosity (pension)	Scruggs & Allan (1980 to 2011) Missing: Luxemburg
		RR of Standard pension RR of minimum pension Coverage rate of public pension	Scruggs & Allan (1980 to 2011) Missing: Luxemburg
		Size of welfare state (Social expenditure – old age expenditure)	OECD (1980 to 2011)
Time-invariant country-specific variable	Institutional design of public pension	Bismarck regime and Beveridge regime	
		Strong earning-relatedness and weak earning-relatedness	

Table 8-8 List of countries and number of inclusion

Country	Frequency of inclusion	Country	Frequency of inclusion

Australia	5	Italy	7
Austria	7	Netherlands	8
Belgium	7	Norway	6
Canada	31	Portugal	7
Denmark	10	Spain	8
Finland	18	Sweden	8
France	6	Switzerland	1
Germany	8	UK	15
Greece	9	USA	8
Ireland	7		

8.4. Descriptive statistics

This section presents the basic statistics of the main variables and shows the trend of each variable. It reviews how income inequality among the old-age population, spending on private pensions and the proportion of the old-age population change over time. In addition, it shows how the generosity of the traditional welfare state changes over time. This section provides the correlation coefficients of the independent variables and an analysis of variance which shows whether a significant difference in income inequality exists between different institutional designs of public pension systems.

8.4.1. Descriptive statistics of welfare state

Before going on to the main analysis, it is necessary first to review the current situation of the welfare state. As shown above, an aging population is becoming a serious issue in most of the developed world and the main strategies of modern welfare states for coping with an aging population can be summarised in two points. The first is to rearrange the institutional design of the pension programme from a public-centred system to a mixed public-private system and this change is also related to limiting the role of the public pension system. The second is to increase the labour market participation rate of the elderly by either delaying the retirement age or prolonging labour market participation after the legal retirement age. Now we can check the actual trend of an aging population, changes in the generosity of pension system and the labour market participation rate of the elderly from the data set.

First, Figure 8-1 presents the development of the Gini coefficient among the elderly. As stated in the previous section, there are many missing values here. For example, there are only two cases for Switzerland and countries such as Spain, Portugal, Ireland and Belgium have data for only about the ten most recent years. The Gini coefficient shows that income inequality among the elderly looks stable over this period, except for some countries. Australia and Sweden show a consistent increase in income inequality, and the US and Germany also increased but at a modest rate. In contrast, income inequality among the elderly plummeted in Greece and the Netherlands. However, it seems that most countries remained at a similar level. For example, income inequality increased in Sweden but still maintains a low level compared with other countries; Portugal showed a decrease in income inequality in the last ten years but its level is still very high.

The overall trend shows that income inequality had decreased between 1980 and 2011 but the detailed trend is a bit different. It decreased until 2000 and then it began to increase after the early 2000s. Chapter 2 showed the trend in the income inequality of the whole population in OECD countries, and showed that income inequality decreased until the middle of the 1980s but it turned into an increase from then on. The overall trend is not much different from the trend that was shown in Chapter 2.

Figure 8-1 Trend of income inequality among elderly

<Sources: OECD income distribution data set>
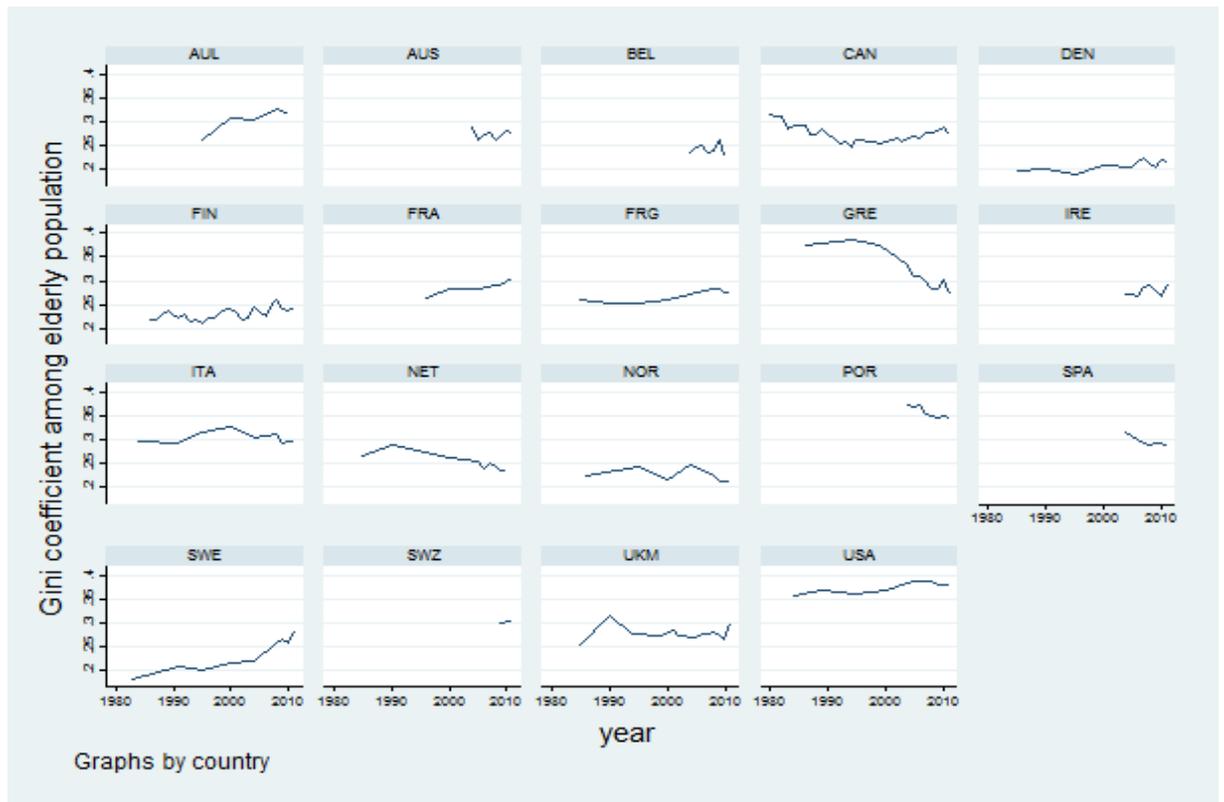
Figure 8-2 shows the proportion of the population over 65 years old. There is a small difference between the countries. It looks steeper in Italy, Finland and Greece and not very steep in the US, the UK, and Norway. Nevertheless, it is clear that developed countries are facing a serious aging population issue.

Figure 8-2 Trend of old age population

Graphs by country

<Sources: Comparative Welfare State data set:
http://www.lisdatacenter.org/resources/other-databases/>
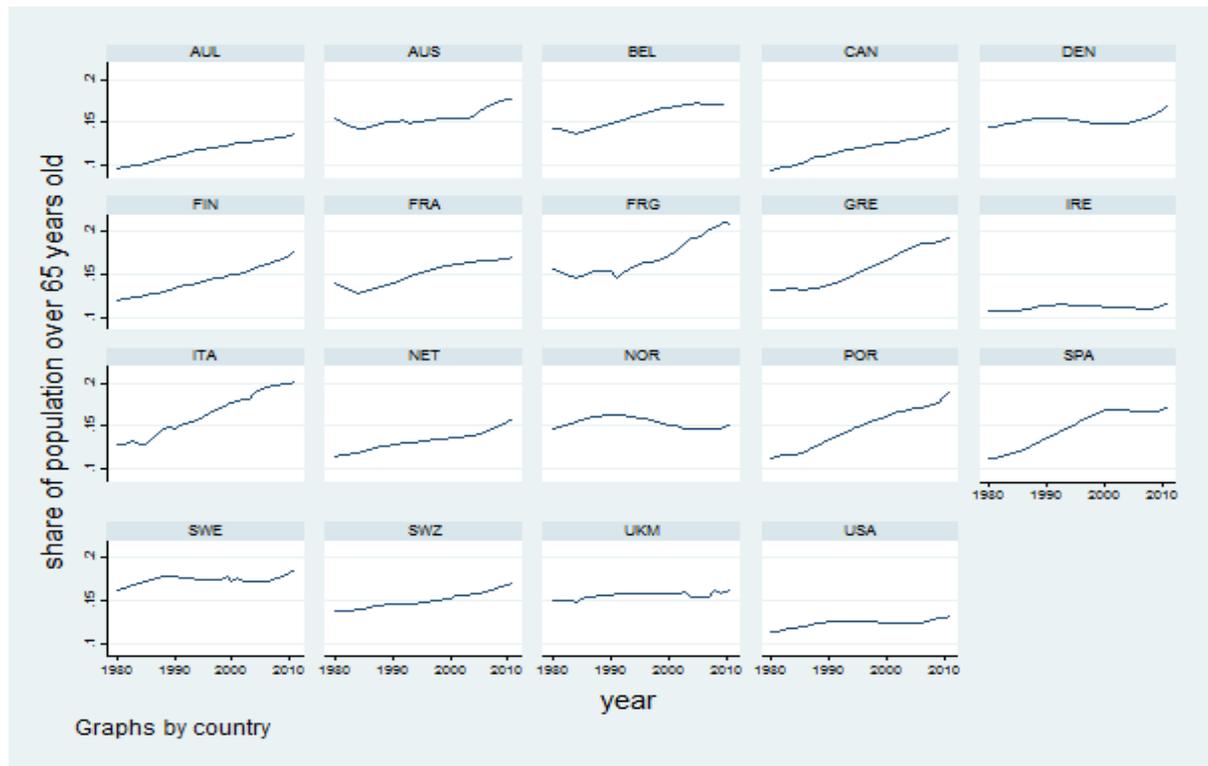
Figure 8-3 Generosity of public pension

Graphs by country

<Sources: Comparative Welfare Entitlement data set: http://cwed2.org/>
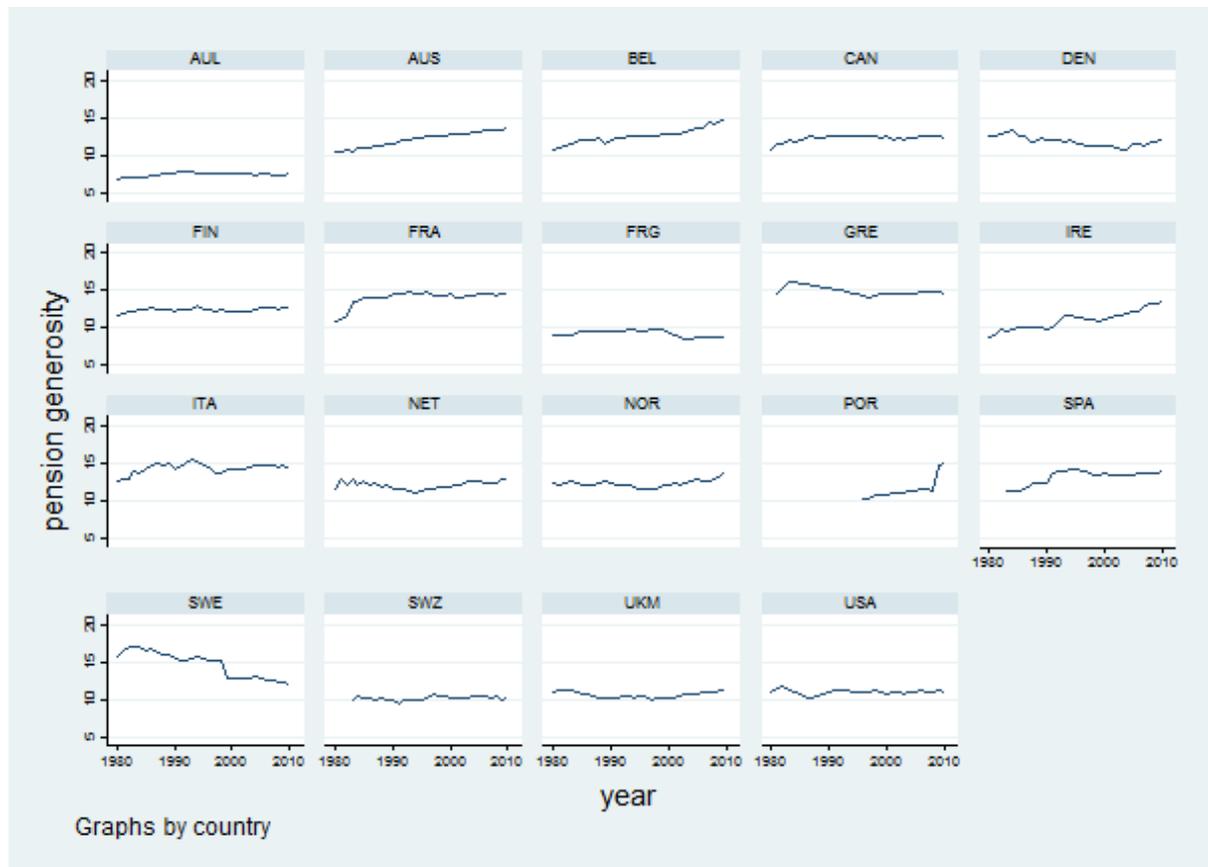
Figure 8-3 shows the trend of pension generosity for twenty countries. The average generosity score of public pensions was 10.9 in 1980 and 12.37 in 2010 so it has, in fact, increased slightly during the last three decades. However, the trend is different in different countries. The US and the UK remained stable at the low level whereas Denmark, Norway and the Netherlands remained stable at a high level. Spain and Belgium showed a slow increase but Sweden showed a very steep decrease. From a time perspective, the mean values of the pension generosity scores increased from 1980 to 1990, and then began to decrease and fell rapidly from the middle of 1990 to early 2000. There was an economic recession from the late 1970s to the early 1980s so it has been argued that the age of austerity began in the early 1980s (Pierson 2001; Allan & Scruggs 2004). However, it turned into an increase from the middle of 2000. In brief, pension generosity seems to be very stable in most countries but has decreased radically in Sweden. So we cannot say that the generosity of pension programmes has retrenched in the modern welfare state. In addition, it is not clear that an increase in a mixed public-private funding system leads to a decrease in the quality of the public pension programme.

Figure 8-4 Labour participation rate of elderly

Graphs by country

<Sources: Comparative welfare state data set: http://www.lisdatacenter.org/resources/other-databases/>
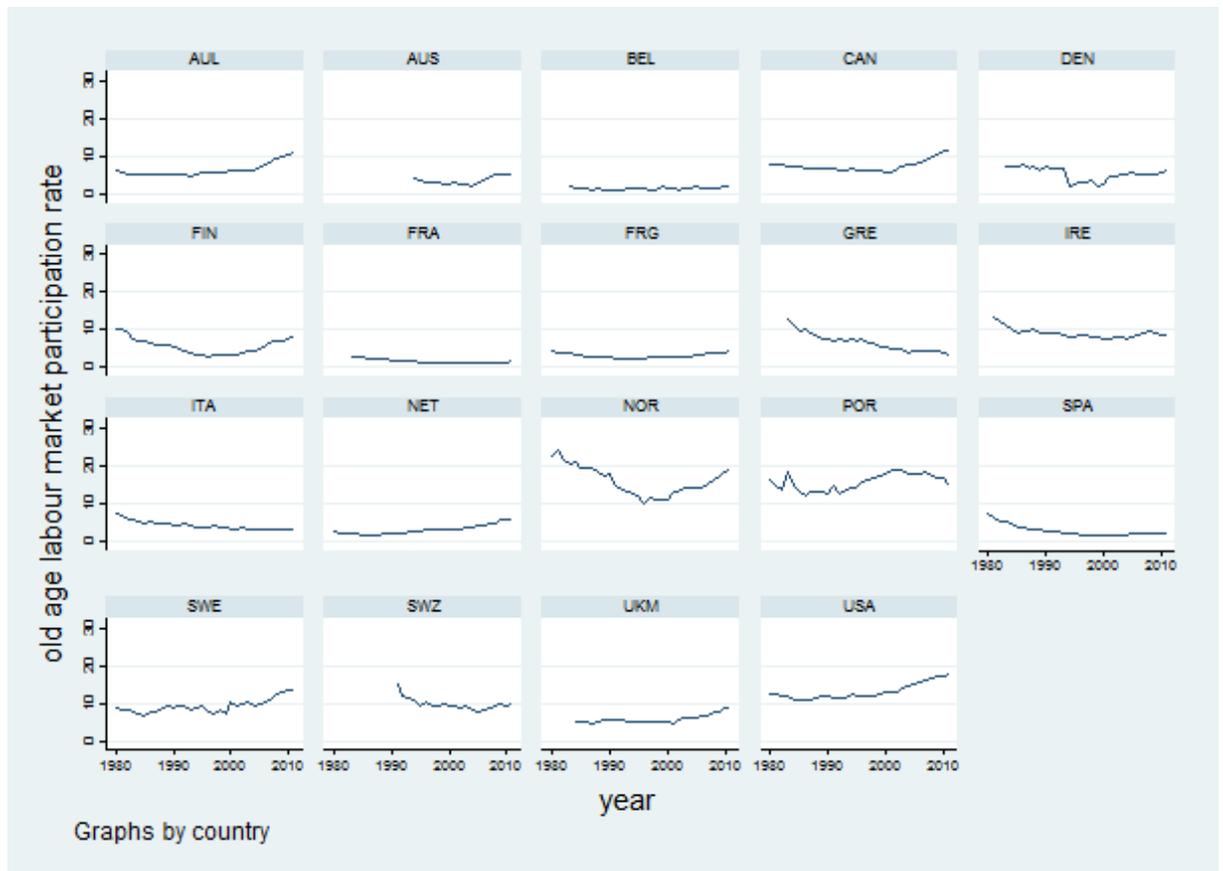
Figure 8-4 shows that the labour market participation rate of the elderly over the last three decades consistently decreased until 2000 but turned into an increase from 2000 and kept increasing until recently. Most of the countries showed a similar pattern but Greece and Ireland showed a consistent decrease whereas New Zealand and Norway both showed quite fast increases since around 2000. On average, the labour market participation rate of the elderly was around 10% in 1980, fell below 6% around the end of 1990s but went up to about 9% in 2010.

Now we turn to the size of private pension spending compared with a public pension. As mentioned above, one of the main trends in pension reform is introducing a mixed funded system. Figure 8-5 presents the development of relative sizes of private pension spending. Although the size of public pensions remains at a similar level, the relative size of private pension spending has increased, as shown in the graph.

Figure 8-5 Share of private pension

Graphs by country

168

<Sources: Comparative welfare state data set: http://www.lisdatacenter.org/resources/other-databases/>
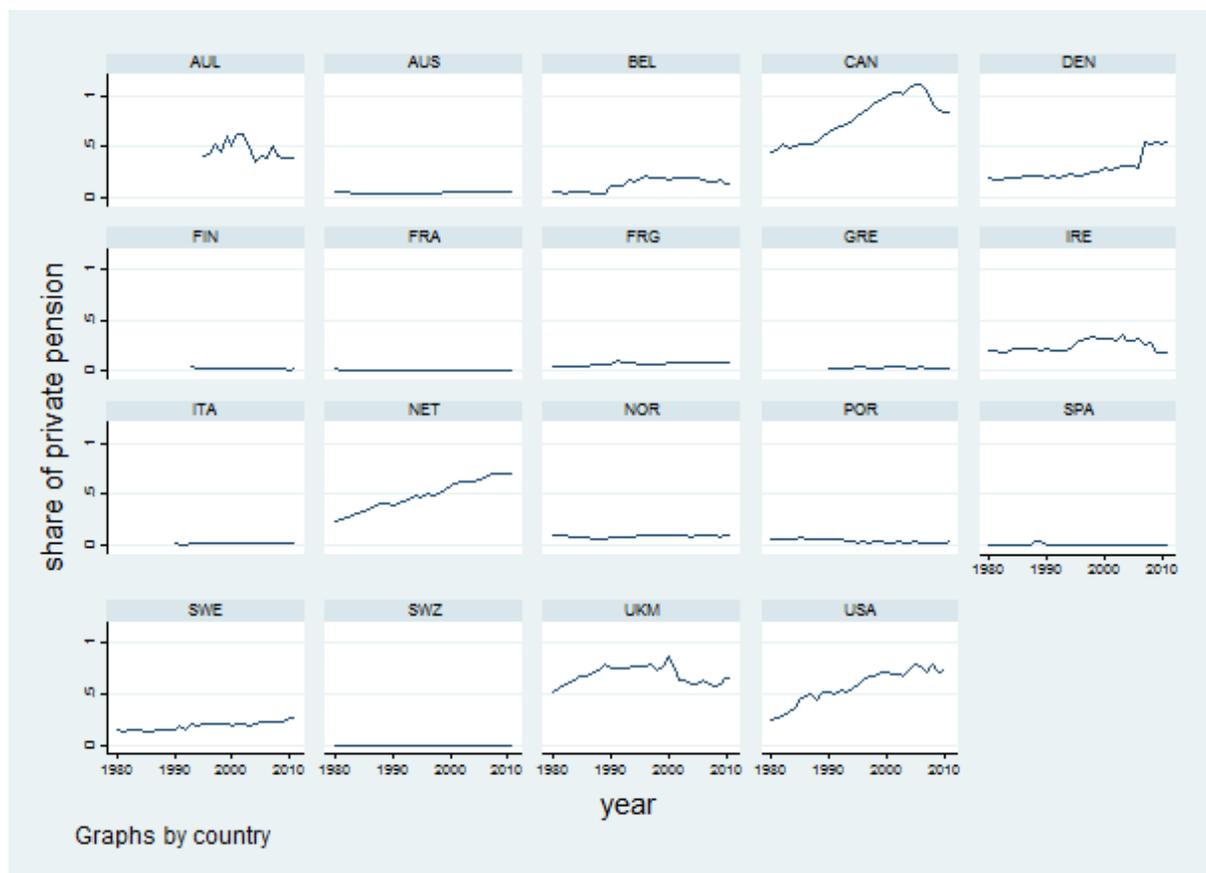
Some countries, such as Finland and France, did not show any significant changes in the size of private pension spending, but Canada, Denmark and the US showed quite a steep trend line which means that the size of private pension spending had increased consistently. Belgium, Sweden and the UK also increased but the changes were relatively small. On average, some countries remained the same and some countries increased, but few countries showed a decrease in the relative size of private pension spending. It seems that the proportion of private pension spending is on the increase in general.

Table 8-9 presents a summary of income distribution, the size of private pension, and the degree of earnings-relatedness and coverage rate according to different types of public pension institution.

Table 8-9 Summary by type of public pension

Type of public pension institution	Income inequality (Gini Coefficient)		Size of private pension	Earning-relatedness	Coverage rate
	Working age	Old age			
Weak earning-related	0.293	0.269	0.308		0.953
Strong earing-related / high coverage	0.253	0.242	0.196		1.01
Strong earning-related / low coverage	0.308	0.299	0.130		0.785

As expected, income inequality is lower in the strong earnings-related/high coverage group than in the other two groups. It is the same for working age as well as old age. The size of private pension is highest in the weak earnings-related group. This is not surprising as most of the countries in the weak earnings-related group had a Beveridge regime with the intention of providing a safety net for the poor only, whereas the middle class is explicitly expected to use various forms of private pension (Korpi & Palme 1998). Regarding coverage rate, it is highest in the strong earnings-related/high coverage group and lowest in the low coverage group. The weak earnings-related group shows a

relatively high coverage rate as expected. The descriptive statistics show that the strong earnings-related/high coverage group has better income distribution with a low level of private pensions. However, it is a bit different for the other two groups. The weak earnings-related group has the highest level of private pension as we expected, but, in fact, income inequality is higher for the low coverage group, although the proportion of private pensions in that group is the lowest among the three groups. This table sheds light on the idea that the size of private pension might not be directly related to an increase in income inequality.

Table 8-10 ANOVA inequality and institutional design

	Number of Observation= 221		R-Squared=.2175	
	Root MSE=. 03907		Adj R-Square=.2103	
Source	Partial Sum of square		F	Prob>F
Institutional design	.092539683		30.30	0.0000(***)
Residual	.332923734			
Total	.425463417			

Table 8-10 shows that there is the difference in income inequality among different institutional designs of public pension system, which shows that income inequality is higher in the strong earning-relatedness/low coverage group and relatively lower in the strong earning-relatedness/high coverage group . The results of the ANOVA shown in Table 8-10 show whether this difference is statistically significant. It shows that the F-value is 30.30 and the P-value is zero, which indicates that this difference is statistically significant. In other words, the results of the ANOVA imply that income inequality is significantly different according to the institutional design of the public pension system. A few more ANOVA tests were carried out the P-value was lower than .01 in all cases. That means that the difference between income inequality among the old-age population and in spending on private pensions is significantly different according to the type of the public pension system.

Table 8-11 Correlates of independent factors

	Share of old age population	Labour market participation rate of elderly	Share of private pension	Welfare generosity	Real GDP per capita	Capital openness
Share of old	1.000					

age population						
Labour market participation rate of elderly	-.1517***	1.000				
Share of private pension	-.3750***	.1413***	1.000			
Welfare generosity	.5304***	-.1280***	-.4839***	1.000		
Real GDP per capita	.1737***	-.0754*	.1685***	.1151***	1.000	
Capital openness	.2663***	-.1983***	.2823***	.0236	.6325***	1.000

Multi-collinearity between the independent variables may cause an unstable regression coefficient. Table 8-11 shows the correlations between the independent variables. There are some variables that reach in excess of .50 which indicates that there is some degree of multi-collinearity in this model. The focus of this analysis is the structure of public pension systems and spending on private pensions and Table 8-10 shows that spending on a private pension does not highly correlate with other variables. This thesis accepts some degree of multi-collinearity between controlled variables, particularly correlation between the openness of the capital market and the real GDP per capita. However, this variable is excluded in sensitivity tests to keep the bias caused by multi-collinearity to a minimum. The results are available in Appendix A.1 and A.2.

In brief, we can observe an aging population in most of the countries and the fact that more elderly people now stay in the labour market after retirement age. In addition, the findings show that the generosity of public pension programmes decreased much during the 1990s but increased in the 2000s, so we cannot see a clear retrenchment of public pension programmes. However, it is clear that the relative size of the private pension system is increasing across the developed world, although this increase has not led to a reduction in the quality of public pension programmes so far. This section also shows that significant differences exist according to the institutional design of a public pension

system. The proportion of private pensions is highest in weak earning-related group but income inequality is highest in strong earning-relatedness/low coverage group.

Based on the descriptive information obtained, the next section will examine the relationship between income inequality and private pensions in the context of the institutional design of a public pension system.

8.5. Income inequality and the effect of private pension

This section presents the result of the main analysis on the relation between private pensions and income inequality. As stated in Chapter 1, the primary purpose of this thesis is first to look at the empirical relationship between private pensions and income inequality, and second to look at the effect of the institutional design of a public pension system and then finally to look to how the interaction between the two affects income inequality. To find the answers, this section presents the effect of private pensions first, and then gives the regressions with the institutional design of a public pension and with interaction.

8.5.1. Effect of private pension: without context variables

This empirical section employs the following process. First, the fixed-effect model controlling the between-countries effect is examined. This model is expected to find the within-country effect of the independent variables which removes between-countries variance. Then, the results of the random-effect model which assumes that the country level variance is uncorrelated with the independent variables are compared with the results of the fixed-effect model. Finally, the results of the multi-level analysis are shown to see the within-country effect and the between-country effects. The results from each model are shown in Table 8-12. The reported models used generosity score as a variable for welfare effort, as we can capture more observation when the generosity index is employed. These models were tested with expenditure-based measurement again and the results are given in the appendix. They do not show any significant differences.

Table 8-12 Regression without context variable

Variable	Model 1		Model 2	
	Fixed effect model	Random effect model	Within-country[2] effect	Between country effect
Share of elderly population over 65 years old	-.146806 (-.68)	-.048039 (-.43)	-.1600643 (-1.27)	.6664898 (-1.38)
Labour Market participation rate of elderly	.0029096 (1.93*)	.0027736 (3.49***)	.0029254 (3.38***)	.0037229 (2.93***)
Real GDP per capita	1.57e-07 (.34)	1.03e-07 (.30)	9.75e-08 (.29)	-2.27e-06 (-1.37)
Openness of Capital Market	-.0092373 (-1.24)	-.0081605 (-2.50**)	-.0085493 (-2.69***)	.0175321 (1.05)
Relative size private pension	-.0308068 (-2.25**)	-.0397283 (-3.97***)	-.0273172 (-2.31**)	-.1185763 (-3.13***)
Pension generosity	-.0093742 (-2.90***)	-.0075629 (-4.81***)	-.0091885 (-5.21***)	-.0014981 (-.38)
Other generosity	-.0060574 (-2.90**)	-.0061431 (-7.31***)	-.0058462 (-5.27***)	-.0064928 (-5.04***)
Constant	.5380347 (7.57***)	.513131 (18.68***)	.567539 (6.93***)	
Observations	175	175	175	
Clusters	19	19	19	
R square	Within= .5107 Between=.4617 Overall= .4409	Within= .5036 Between=.5320 Overall= .5086	Log likelihood= 492.78781	

As shown in Table 8-12, the results of the fixed-effect and the random-effect models are similar but still there is a difference in the size of the coefficient, which means that the assumption of the random-effect model (Cov(U_i, Xi)=0) is not met in this case. Thus, the estimation of fixed effect is more precise than that of random effect, although the significance and direction of the coefficient remain almost the same. The coefficients of fixed effect solely reflect the within-country effect. This shows that the elderly labour market participation rate is positively related with income inequality, which means that income inequality in the society increases as more elderly people stay in the labour market. Regarding the effect of welfare effort, the direction of the effect is the same as expected. Both social expenditure and welfare generosity have a negative coefficient which means that income inequality decreases when welfare effort increases. The

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[2] Normally within-country effect in this model should have same coefficient with fixed effect model but fixed effect model is estimated by GLM (Generalized Linear model) and within-between effect model is estimated by MLE (Maximum likelihood estimation) so they are slightly different. When within-between model is estimated by GLM, coefficients are identical to fixed effect model.

increase in private pensions, which is what we are interested in, has a negative effect on income inequality. As the proportion of private pensions increases, income inequality decreases. Considering previous studies which have argued that the redistribution effect of private pensions is less than that of public pensions, this result is unexpected. However, this result is in line with those of some of the previous empirical studies which have argued that income inequality gets better as the proportion of private pensions increases (Vliet *et al.*, 2012).

As explained above, the fixed-effect model can show a more precise coefficient than the random-effect model because of the unrealistic assumption of the random-effect model. A multi-level model was used to separate the within-country effect and the between-countries effect. 'Country' means that specific values are included to explain the between-country effect, and each variable is replaced with distance from the mean value of each variable. The result remained almost the same. The relative size of private pension spending was still negatively related to income inequality. As the size of private pension spending increases, income distribution becomes more equal. The multi-level model shows that the effect of the relative size of private pensions has a negative effect on income inequality whereas the elderly labour participation rate has a positive effect on income inequality. Their effects are significant both in within-country and between countries terms. This means that the effects of those variables are significant in a given country, and the countries with high levels of private pension have less inequality than countries with low levels of private pension, whereas countries with a higher elderly labour market participate rate have higher inequality than countries with a lower level of elderly labour market participation rate.

Consequently, it can be argued that an increase in private pensions has a positive effect on income distribution among the elderly and the elderly labour market participation rate has a negative effect on income distribution both within the country and between countries, so the distributive outcome of pension reform is still not clear. Regarding the welfare effort variables, welfare generosity was significant both between countries and within-country. A high level of welfare effort decreases income inequality in a given country, and a country with a high level of welfare effort also has a significantly lower level of income inequality.

Models 1 and 2 do not consider the context variable, which is the institutional design of public pension in this case. As explained above, it is expected that the effect of private pensions can be different according to the institutional design of the public pension system, so models 1 and 2 do not fully capture the effect of private pensions on income distribution. Figures 8-6 and 8-7 show why we need to consider institutional context variables to see the precise effect of private pension.

Figure 8-6 Scatter plot and fitted line
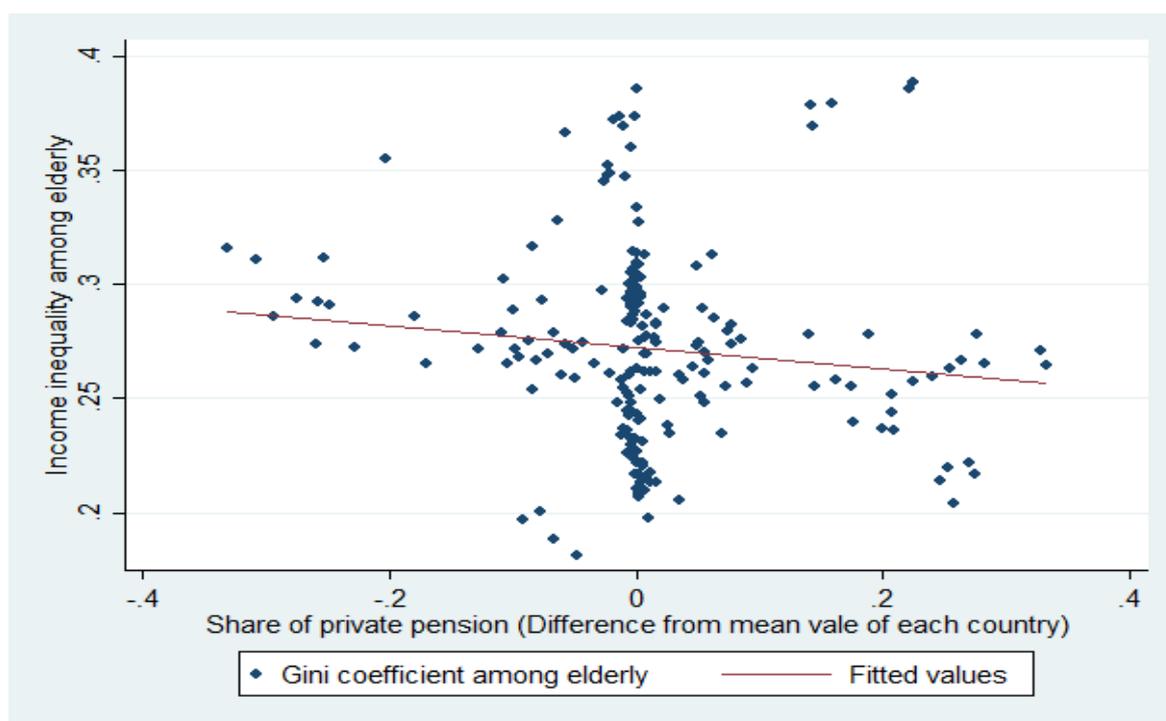
In this scatterplot, the X axis represents the proportion of private pension spending, shown as the difference from the mean value of each country, and the Y axis represents the Gini coefficient among the elderly. As explained above, difference from the mean value is used to estimate the within-country effect. The scatterplot and the fitted line show that there is a negative effect between the two variables, so income inequality decreases when the proportion of private pension spending increases in a given country. It can be inferred that an increase in private pensions is related to a decrease in income inequality in general. In fact, this result is in line with those of several previous studies which have argued that there is a negative relationship between income inequality and an increase in private pensions. However, this general effect is the average value of the coefficient of each country so it does not provide detailed information on how the relation is changed in each country.

Figure 8-7 shows fitted lines according to the institutional design of a public pension system and shows that the relationship between income inequality and private pensions has an opposite direction for some institutions.

Figure 8-7 Fitted line by institution
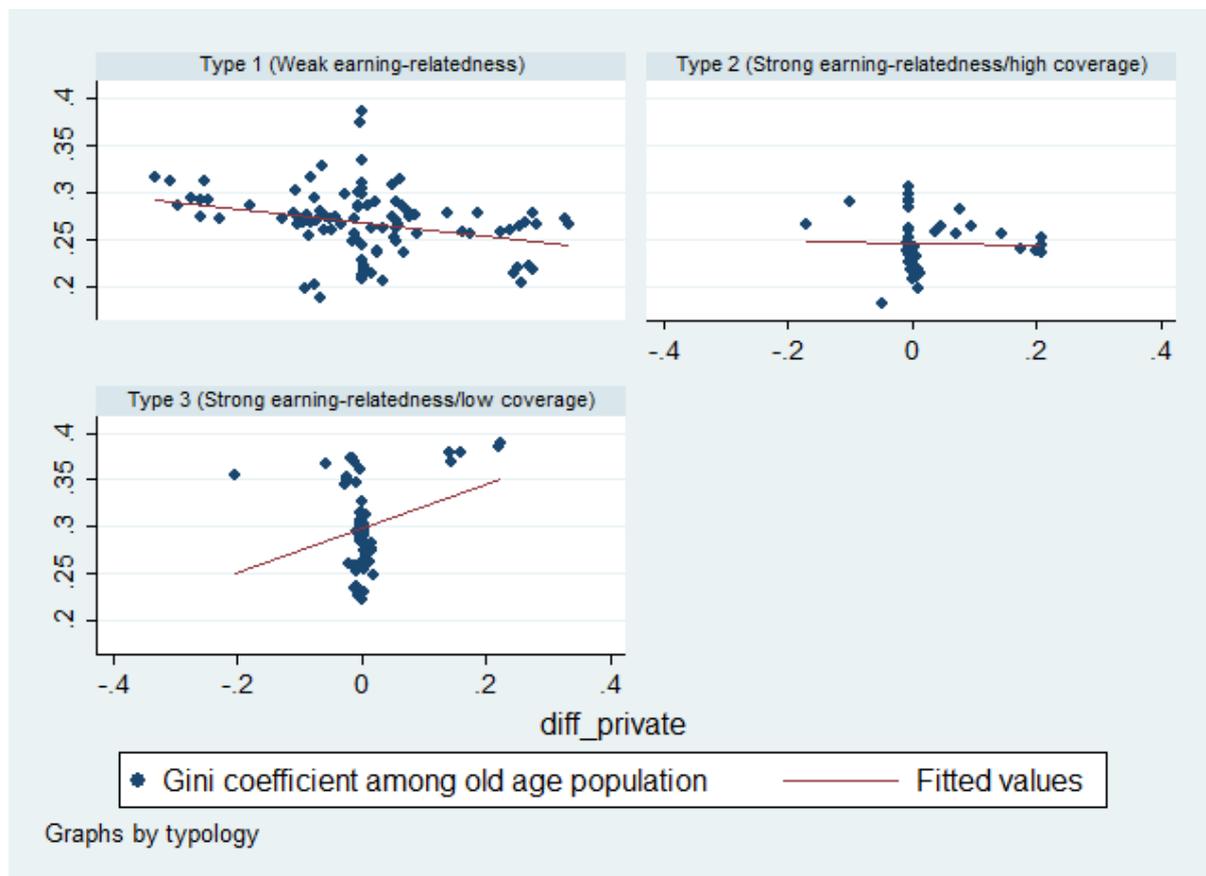
We can see that the slope of private pensions is quite different according to the institutional design of the public pension system. Generally, it looks to have negative effect on the Gini coefficient as shown in Figure 8-6, but in fact, the effect of private pensions is diverse. The relationship looks negative in Weak earning-related group and Strong earning-relatedness/high coverage group but opposite in Strong earning-relatedness/low coverage group. This is an unbalanced panel so the length of the line is different according to the institution. This graph, of course, does not show that this relationship is statistically significant, but certainly, it can be a motivation for further research to explore the different effects of private pensions according to the institutional design of the public pension system. This figure shows why we need to consider the institutional design of public pensions as those differences between countries could be due to the difference in public pension institution and its interplay with private pensions. These context variables on the institutional design of the public pension cannot be tested

in the fixed-effect model as it treats context variables as a fixed effect. The following section shows the results of the random-effect and multi-level models (the random coefficient model) using context variables and interaction variables.

8.5.2. The effect of private pensions in the context of the institutional design of the public pension

Now we can check how the effect of private pensions varies according to the institutional design of the public pension system. As stated in the previous chapter, the first institutional designs employed are the Bismarck and Beveridge models. The Bismarck model is generally based on an earnings-related occupational pension system whereas the Beveridge model is based on a flat-rate and universal coverage pension system. We expect that an increase in private pensions will not have a significant effect on changes in income inequality in the Bismarck model and that an increase in private pensions will be related to an increase in income inequality in the Beveridge model. Table 8-13 presents the result of the analysis. In this table, the Beveridge model is used as a reference group

Table 8-13 Context variable: Bismarck VS Beveridge

Variable	Model 3		Model 4			
	Random effect model		Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.1251201 (-1.06)	-.1240443 (-1.04)	-.160062 (-1.27)	-.6663382 (-1.26)	-.1675118 (-1.31)	-.658309 (-1.25)
Labour Market participation rate of elderly	.0028515 (3.59***)	.0029022 (3.56***)	.0029254 (3.37***)	.0037229 (2.93***)	.0028916 (3.31***)	.003761 (2.95***)
Real GDP per capita	1.39e-07 (.41)	1.37e-07 (.40)	9.75e-08 (.29)	-2.27e-06 (-1.35)	9.65e-08 (.28)	-2.29e-06 (-1.36)
Openness of Capital Market	-.0081581 (-2.52**)	-.0081643 (-2.52**)	-.0085492 (-2.69***)	.0175317 (1.05)	-.0086288 (-2.71***)	.017375 (1.04)
Relative size private pension	-.0335407 (-3.21***)	-.0330202 (-3.15***)	-.0273175 (-2.31**)	-.1185931 (-2.67***)	-.0269819 (-2.27**)	-.1189054 (-2.68***)
Pension generosity	-.0081358 (-5.12***)	-.0085086 (-4.79***)	-.0091885 (-5.20***)	-.0014973 (-.37)	-.0088758 (-4.49***)	-.0015577 (-.38)
Other generosity	-.0062177 (-7.36***)	-.0061739 (-7.12***)	-.0058462 (-5.26***)	-.0064929 (-5.03***)	-.0057803 (-5.13***)	-.0065268 (-5.06***)
Bismarck	.0278655	.0308773	-.0000172		-.0004071	

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model	(1.84*)	(1.77*)	(-.00)	(-.02)
*Private pension *Bismarck*		-.0335558 (-.35)		.0436643 (.35)
Constant	.5098544 (18.89***)	.5109507 (18.66***)	.6089598 (7.72***)	.5685089 (6.85***)
Observations	175	175	175	175
Clusters	19	19	19	19
R square	Within= .5037 Between=.572 Overall=.5616	Within= .504 Between=.57 Overall=. 56	Log likelihood=492.79	Log likelihood=492.85

As explained above, one advantage of the random-effect model is that it can include context variables that do not change over time in the model but it could produce a spurious result due to the unrealistic assumption. In contrast, the within-between effect model can capture the advantages of both the fixed-effect model and the random-effect model so we can test time-invariant variables without the assumption of the random-effect model.

As the Beveridge model is used as a reference group, the coefficient of private pensions indicates the effect of private pensions in the Beveridge model. The coefficient shows that an increase in private pensions is related to a decrease in income inequality among the elderly. An increase in private pension is expected to be associated with an increase in income inequality, as we expect that the rich can get benefit from a private pension on the top of a public pension in the Beveridge system. However, income inequality decreases as the proportion of private pensions increases in Beveridge-system countries.

The core of the argument on the different effects of private pensions is the earnings-relatedness of the public pension. The private pension is expected to have an insignificant effect in the Bismarck system because it has earnings-relatedness so the rich have no incentive to join a private pension scheme, and it is the opposite in the Beveridge model because it has a flat-rate universal system so the rich have a strong incentive to join a private pension scheme. However, this result implies there can be a more important factor than earnings-relatedness in income inequality so it leads us to the next analysis, which employs a classification which is more specific.

Table 8-14 Regression with context variable

Variable	Model 5		Model 6			
	Random effect model		Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.0974944 (-.86)	-.0400519 (-.34)	-.1554209 (-1.23)	-.9556664 (-1.99**)	-.1084769 (-.87)	-1.016012 (-2.11**)
Labour Market participation rate of elderly	.002768 (3.45***)	.0023498 (2.84***)	.0026554 (3.10***)	.0036381 (2.86***)	.002212 (2.55**)	.0032905 (2.61***)
Real GDP per capita	1.75e-07 (.51)	1.15e-07 (.33)	1.33e-07 (.39)	-2.13e-06 (-1.31)	5.49e-08 (.16)	-2.22e-06 (-1.36)
Openness of Capital Market	-.0086134 (-2.67***)	-.00882 (-2.75***)	.0091503 (-2.88***)	.0106632 (.55)	-.0093045 (-2.99***)	.0082479 (.42)
Relative size private pension	-.0364459 (-3.62***)	.0219977 (.77)	-.0276365 (-2.34**)	-.0873463 (-2.03**)	.0514865 (1.60*)	-.081998 (-1.90*)
pension generosity	-.0080339 (-5.08***)	-.0080513 (-5.08***)	-.0093938 (-5.33***)	.0014011 (.33)	-.0094776 (-5.39***)	.0013623 (.32)
Other generosity	-.0058912 (-6.66***)	-.0059427 (-6.71***)	-.0058936 (-5.32***)	-.0046706 (-3.07***)	-.0062478 (-5.59***)	-.0042987 (-2.81***)
Weak earning-related	-.0318121 (-1.94*)	-.020627 (-1.22)	-.0240257 (-1.39)		-.0250193 (-1.45)	
Strong/High coverage	-.0158947 (-.79)	-.0046179 (-.22)	-.0372331 (-1.84*)		-.0384762 (-1.90*)	
Private pension * Weak earning-related		-.0642223 (-2.13**)			-.0842883 (-2.58**)	
Private pension *Strong/high coverage		-.0741316 (-1.84*)			-.1102557 (-2.50**)	
Constant		.52767585 (17.82***)	.558959 (7.38***)		.56292484 (7.50***)	
Observations	175	175	175		175	
Clusters	19	19	19		19	
R square	Within= .5018 Between=.6332 Overall=.6117	Within= .5291 Between=.6154 Overall=.5896	Log likelihood =494.4537		Log likelihood = 498.387	

In this model, countries are divided into three categories based on coverage rate and earnings-relatedness. The random-effect and multi-level models employing a regime dummy and cross-level interaction variables are shown in the table. The significance and direction of the other variables' coefficients in both models are not much different from

each other. Both models contain some interesting results. First, there is a significant difference in inequality between different institutional designs in public pensions. The descriptive statistics show the difference in income inequality, and these results show that income inequality is significantly lower in strong earning-relatedness/high coverage group compared with weak earning-relatedness group and strong earning-relatedness/low coverage group. They show that there is no significant difference between weak earning-relatedness group and strong earning-relatedness/low coverage group. The effect of private pensions is also different from what we expected. Without cross-level interaction variables, it shows that an increase in private pensions is still related to a decrease in income inequality. However, the effect is different according to groups when cross-level interaction variables are included.

This shows that an increase in private pensions is related to an increase in income inequality in the high earnings-related/low coverage group and a decrease in income inequality in the other groups. In fact, this effect is at the critical point (the Z-statistic is 1.60, which made the P-value 0.10) but the P-value is lower than 10% if the generosity score is replaced with social expenditure, or if the generosity score is employed without separation into pension generosity and other generosity scores. Based on the previous discussion, this study assumes that the effect of private pensions is significantly related to an increase in income inequality in the low earnings-related group. However, income inequality is reduced as the proportion of private pensions increases in this group. We would expect that a private pension in this group increases income inequality as the rich have an incentive to have a private pension and the poor are likely to be excluded from the benefit of a private pension. However, the results show the opposite. Income inequality in this group significantly decreases as the proportion of private pensions increases. For the strong earnings-related/high coverage group, it is expected that a private pension does not have a significant effect as the private pension is not attractive in this group. But the results show that income inequality is reduced as well and the size of the coefficient is larger than in the weak earnings-relatedness group.

Korpi and Palme (1998) argued that strong earnings-relatedness is likely to make private pensions less attractive for the rich so we expect that private pensions would not have a significant effect under a strong earnings-related pension system. However, the findings of this study show that private pensions could have a significant and negative effect on

income distribution even when public pensions have a strong earnings-related system but the coverage rate is relatively low.

This is an unexpected result so several sensitivity tests were used to check it. As discussed in the previous section, all the models were re-tested with an expenditure-based measurement instead of welfare generosity. Also, the correlation table shows that the openness of the capital market is relatively highly correlated with GDP per capita, so all the models were re-tested without the openness of the capital market variable. Finally, this is an unbalanced result so the results could be skewed by one extreme case, so jackknife analysis was done as well. There were small differences in the size of the coefficient, but the direction and significance of the coefficient remained the same. In fact, an increase in private pension in strong earning-relatedness/low coverage group was significantly related to an increase in income inequality at the 10% level in all sensitivity tests. All the results of the sensitivity tests are available in the Appendix A.1 and A.2.

The result is clearer if we look at the conditional plot. The conditional plot presents the marginal effect of the independent variables on the dependent variable. In this case, it shows how much the Gini index is changed when the proportion of private pensions increases by one unit of measure. It shows that the marginal effect of private pensions is to decrease income inequality in both the weak earnings-related group and the strong earnings-relatedness/high coverage group and that the slopes are almost similar to each other. In contrast, the slope of the strong earnings-relatedness/low coverage group shows an increase in income inequality as the proportion of private pensions increases.

Figure 8-8 Conditional effects plot, outcome: income inequality among elderly 1980-2010
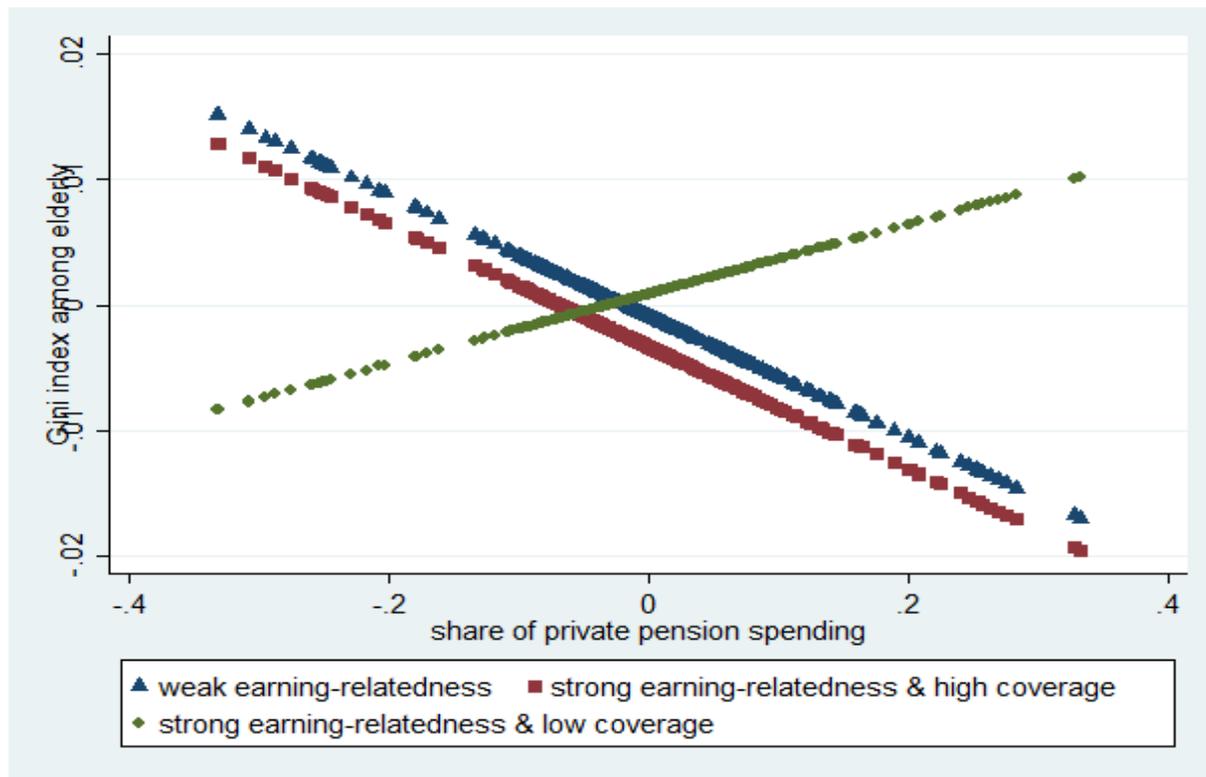
Another issue regarding this model is that the openness of the capital market has a significant effect on the decrease of income inequality among the elderly. Although the between-countries effect is not significant, it is significant that income inequality among the elderly decreases as the openness of the capital market increases in any given country. This is also an unexpected result since it has been reported that the openness of the capital market makes a pension system more vulnerable to risks from economic fluctuation, although this topic is quite controversial.

The results of this analysis can be summarized as follows. This model shows that an increase in private pension spending decreases income inequality in general. But the effect of private pensions is different depending on the interplay between private pensions and the institutional design of the public pension system. Based on theoretical discussions in studies, this study predicts that private pensions will increase income inequality in the weak earnings-related group but not in the other groups. However, in fact, income inequality is reduced as private pensions increase in weak earning-related group and strong earning-related/high coverage group.

8.6. Discussion: Private pensions and institutional design of public pensions

Previous studied have pointed out that earnings-relatedness and universal coverage are salient factors affecting the distributional outcome of the public pension system (Palme, 2006; Kangas & Palme, 1993; Korpi & Palme, 1998). As mentioned above, many scholars now agree that universal coverage brings better income distribution than a targeted system but earnings-relatedness is still controversial. On the one hand, strong earnings-relatedness brings about more income inequality among the elderly as their income history in working age is reflected in old age under a strong earnings-related system. This means that inequality among the working-age population is maintained when they get old. On the other hand, it is argued that the rich will want to buy private pensions if earnings-relatedness is weak, so the income gap between the rich and the poor is widened as the poor cannot afford a private pension. This argument assumes that private pensions have a less redistributive effect than public pensions. However, the findings of this study show that income inequality does decrease when private pensions increase in the Beveridge model. This shows the possibility that there might be a more important factor than earnings-relatedness. So this study applied a classification based on earnings-relatedness and coverage rate at the same time. In this classification, countries with weak earnings-relatedness are likely to have a high coverage rate whereas the coverage rate is quite varied in countries with strong earnings-relatedness.

As shown in the previous section, the results show that income inequality is reduced as the proportion of private pensions increases in both the weak earnings-related group and the strong earnings-related/high coverage group. The result is the opposite in the strong earnings-related/low coverage group. In this group, income inequality increases as the proportion of private pensions increases,[3] which means that the rich can get benefit from both the strong earnings-related public pension and a private pension. On the other hand, the poor are unlikely to get any benefit even from the public pension. In fact, some countries in this group, such as Spain and the US, show strong earnings-relatedness and a high level of benefit in second-tier pension programmes but a very low level of benefit in the first-tier pension programmes. What we have found here is that income inequality is

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[3] However, it should be kept in mind that this effect is at the critical point. As mentioned earlier, this effect becomes clearly significant when the generosity score is replaced with social expenditure. In addition, this effect is still significant when the generosity score is employed if it is not divided into pension generosity and other generosity score.

reduced as private pensions increase in countries with a high coverage rate regardless of the degree of earnings-relatedness. Thus, the results of this study seem to support the notion that strong earnings-relatedness does not reduce income inequality among the elderly, as private pensions are not less redistributive as much as we had expected.

The argument that strong earnings-relatedness brings positive income distribution assumes that expansion of private pensions has a bad impact on income distribution. However, the findings show that an expansion of private pensions is not always associated with an increase in income inequality. The institutional design of the public pension system matters, and expanding the coverage of the public pension seems to be more salient than earnings-relatedness.

As shown in Table 8-4, most of the countries that have strong earnings-relatedness are based on the Bismarck model. Among those countries, countries in strong earning-relatedness/high coverage group mostly have strong earnings-relatedness, a high replacement rate and minimum pensions in the first-tier programme, whereas countries in strong earning-relatedness/low coverage group have targeted programmes (Germany, Luxembourg) or a minimum pension in the first-tier programme but a very low replacement rate (Portugal, Spain) or do not have a proper first-tier programme (Austria, US). Consequently, countries in strong earning-relatedness/low coverage group have relatively low coverage rates compared with countries in strong earning-relatedness/high coverage group. The Netherlands is an exceptional case as it has a targeted first-tier pension programme. However, the replacement rate of the first-tier programme is very high compared with other countries. This will be discussed in the next chapter.

Thus, these findings also support the argument that universal coverage is more effective in reducing income inequality than targeting or occupational coverage. In addition, these results show that private pensions can play a positive role in income distribution if they are combined with a high coverage rate of the public pension. In this case, private and public pensions can be complementary. This does not argue that strong earnings-relatedness is related to an increase in income inequality, as it does not directly consider the relationship between earnings-relatedness and income inequality, but the role of earnings-relatedness in the context of an increase in private pensions. It shows that strong earnings-relatedness can restrain increases in private pensions, but it does not necessarily bring a decrease in income inequality.

In brief, the paradox that a more unequal and earnings-related public pension has more equal income distribution has been proposed in previous studies but this current study shows slightly different results. In a broad sense, expansion of private pensions is not necessarily associated with an increase in income inequality. The results show the opposite in fact. The effect of an increase in the private pension system depends on the interaction between private pension and public pension, and strong earnings-relatedness does not bring about better income distribution whereas widening coverage looks to be more important for bringing better income inequality. In other words, these results still imply that a universal system may bring about a reduction in income inequality compared with a targeted system. In this sense, these results can be viewed as supporting the paradox of redistribution, which argues that a universal system is preferable to a targeted system in the reduction of poverty and inequality.

In fact, the core discussion on the paradox of redistribution is whether it includes the middle class or not. In a targeted system, the middle class is excluded from the public welfare system so they have an incentive to seek private insurance, which increases the income gap between the poor and the middle class. In this case, it looks more important to support the poor through the public pension system. It can be inferred that income inequality increases when private pensions increase in strong earning-relatedness/low coverage group because the income gap gets larger if the public pension covers only a limited proportion of the population, so the poor are likely to be excluded from the public pension system. In this case, income inequality can still increase if the middle and rich classes join a private pension scheme, although the proportion of private pensions is still very low. In other words, both strong earning-relatedness/high coverage group and strong earning-relatedness/low coverage group have an unequal pension structure as they both have strong earnings-relatedness so the rich and the middle class do not have an incentive to join a private pension scheme. That is why the proportion of private pensions is still low in both types. However, in strong earning-relatedness/low coverage group the poor are likely to be excluded from the public pension so income inequality gets bigger just by a small increase in private pensions. For weak earning-relatedness group, it can be inferred that income inequality does not get worse although the rich and the middle class are likely to buy private pensions as the poor are still covered by the public pension.

This is just an inference from what has been found from this analysis. There is one more thing that should be considered. As shown above, most of the developed countries have a two-tier pension system. The results raise a question about the role and effect of a first-tier pension programme. As mentioned above, a second-tier programme normally reflects the income security dimension so it is contribution-based and more selective, whereas the first-tier programme reflects the redistributive dimension. The difference in coverage matters in income inequality as shown above, and it shows that the important thing is whether the poor can be covered by a pension system or not. The poor are unlikely to have private pensions so the income gap would increase if the quality of the public pension is low. In this regard, it is expected that the benefit level of each tier programme might have different effects on income inequality, especially when they are combined with a private pension. Strengthening the first-tier pension programme can be a good strategy for achieving better income distribution under an increase in private pensions. Therefore, the next chapter will explore the distributive effect of first- and second-tier pension programmes considering an increase in private pensions, as a supplementary analysis to this chapter.

Chapter 9. How private pension is related to income inequality part 2

9.1. Introduction

Chapter 8 explored the relationship between private pensions and income inequality. The results showed that income inequality increases when the proportion of private pensions increases if the public pension system has low coverage and high earnings-relatedness. It can be inferred that to cover a large population it is essential to relieve income inequality so that what matters is whether the poor are covered or not by the public pension programme. It could be argued that covering a large population is essential for relieving income inequality when private pensions increase. This means that it is more important to secure a high coverage rate of the public pension system than to establish a strong earnings-related pension programme under fiscal pressure if we want to relieve income inequality among the elderly.

As shown in the previous section, the public pension institution consists of a two-tier system in most developed countries, which was not considered in the classification in the previous chapter. Palme (2006) argued that the goal of a pension programme can be divided into two dimensions, basic security and income security. Basic security aims to provide a minimum level of income to maintain an adequate standard of living, and income security is aimed at providing the proper level of income replacement considering income level during the working life. Usually, it is believed that a first-tier pension reflects the basic security dimension and the second-tier pension reflects income security. Considering this, it is plausible that the pension income of the poor is more closely related to the first-tier pension programme as the second tier pension is inevitably more selective. Thus, the distributive outcome of a pension programme is likely to be different according to the arrangement of the programme. Some countries maintain a generous level of benefit in the first tier whereas others have generous benefit in the second-tier programme and this is expected to make a difference in income distribution.

This chapter provides a supplementary analysis to Chapter 8. This chapter looks at the distributive effect of each tier of a pension programme and its interaction with private pensions. If the distributive effect of a first-tier pension is larger than that of the second-tier pension, this can support the results discussed in the previous chapter that a high

coverage rate is important for relieving income inequality when the proportion of private pensions increases. The following section first proposes hypotheses to be tested in this section and their rationale, and then gives descriptive statistics. The result of the analysis is shown and discussed. The discussion is followed by a summary of the results and a discussion of the policy implications. A conclusion then wraps up the discussion on the distributive outcome of pension reform in the modern welfare state.

9.2. Hypotheses for analysis

As mentioned above, the aim of a pension programme is to secure the income level of the previous working life on the one hand and to help the elderly to maintain a standard of quality of life on the other. The former is reflected in first-tier pensions and the latter in second-tier pensions. As the main goal of the first-tier programme is redistribution, a generous benefit level of a first-tier pension programme seems to lead to better income distribution. Some previous studies have shown that higher basic security entitlement tends to decrease the poverty level among the elderly (Kohl, 1993; Palme, 2006). Regarding the second-tier programme, a high benefit level can bring about two results in terms of income distribution: a high benefit level secures a high income in old age so it can be more effective in decreasing poverty among the elderly, but it can also bring about an increase in income inequality as the income gap between the rich and the poor can still remain even among the elderly. In brief, we can draw several facts from previous studies. First, an increase in benefit level in the first-tier programme is associated with a decrease in income inequality among the elderly. Second, an increase in benefit level of the earnings-related pension is associated with a decrease in the poverty level but an increase in inequality among the elderly.

However, the effect of benefit level on income distribution needs to be understood and analysed in the interplay with private pensions. Chapter 8 showed that an increase in private pensions is associated with a decrease in income inequality when it is combined with high coverage. Considering this result, it can be assumed that a high level of benefit in the basic/minimum pension is related to a decrease in income inequality and this relation can be stronger when it is combined with an increase in private pensions. The earnings-related pension is a more complicated case. Chapter 8 showed that strong earnings-relatedness is not necessarily related to a decrease in inequality, although it could be effective in containing the expansion of private pensions. The proportion of

private pensions is also considered to have a close relationship with the benefit level of earnings-related pensions. Therefore, the proportion of private pensions is expected to be low at the high benefit level, and to be high at the low benefit level, but the effect of a high benefit level considering private pensions is unclear, as the previous chapter showed that an increase in private pensions is not necessarily associated with an increase in income inequality.

Some previous studies have shown that a higher degree of income security in earnings-related pensions tends to decrease income inequality among the elderly. Jäntti, Kangas and Ritakallio (1996) investigated the development of pension systems and their impact on income distribution among the elderly in Finland and found that a shift from a 'marginal' to an 'institutional' model of welfare state brings better well-being and income distribution among the elderly. The marginal (or residual) model is a state without basic security and income-related benefit and only with a targeted, means-tested benefit. The institutional model refers to a state with both income security and a basic security system. They argued that the Finnish pension system changed from a marginal model to an institutional model and income inequality and poverty were reduced. Through the transformation, coverage rate, as well as benefit level, had increased very much. It is very true that income distribution got better after the transformation, but it is still not clear whether this was due to the higher benefit level or the higher coverage rate.

As discussed in Chapter 7, several studies have tested the relationship between pension programme and income distribution and have shown that generally an increase in the generosity of a pension programme is related to lower poverty or inequality, but the effect of a pension programme can be different according to institutional arrangement. Most of those studies agreed that an increase in generosity in a first-tier pension programme is more significant for reducing poverty and income inequality. In sum, considering that the previous results showed that a generous pension is related to better income distribution, it can still be hypothesized that a high benefit level in an earnings-related pension is also related to a decrease in income inequality among the elderly. Regarding the interplay between an earnings-related pension and a private pension, it can be hypothesized that a high benefit level of an earnings-related pension limits the effect of private pensions. Consequently, the following hypotheses can be proposed.

Hypothesis 1: An increase in benefit level in the first tier is related to a decrease in income inequality under the control of the other independent variables.

Hypothesis 1-1: The effect of benefit level in the first tier can be strengthened by the interplay with private pensions.

Hypothesis 2: An increase in benefit level in the second tier is related to a decrease in income inequality under the control of the other independent variables.

Hypothesis 2-1: The effect of benefit level in the second tier can limit the effect of private pensions.

Namely, this research assumes that increase of benefit level is related to the decrease of income inequality at both tiers, but this relationship is more significant or larger in the first-tier program, rather than second tier pension.

To test hypotheses 1 and 2, the replacement rate is separated from the welfare generosity score. The benefit level can be measured in various ways but mostly it is measured by replacement rate, so this study also employed replacement rate as a measurement of each tier pension system.

A first-tier pension programme is normally either a minimum pension programme or a basic pension as shown in Chapter 8. The concepts of minimum pension and basic pension are slightly different. However, this study employed the replacement rate of the minimum pension proposed by Scruggs (2013) as a measure of benefit level of a first-tier programme. A minimum pension in Scruggs' data is defined as a pension programme "that is payable to someone above the standard retirement age" (Scruggs & Allan, 2006:58), usually based on a means-test in part or whole and an non-contributory system. Therefore, the concept of 'minimum pension' in Scruggs's data includes both basic pension and minimum pension in the OECD category. So this study employed replacement of minimum pension as a measurement of the benefit level of a first-tier programme.

Regarding the second-tier programme, the replacement rate of a 'standard pension' in Scruggs's data was employed. In his data, a standard pension was defined as a public pension system based on previous contributions and earnings-related pension, so it looks fine to employ this as a measurement of the benefit level of the second-tier programme.

Interactive variables between minimum pension replacement rate (MPR) and private pension, and between standard pension replacement rate (SPR) and private pension are included to test hypotheses 1 and 2. In this model, the welfare generosity score without a pension programme is considered as an independent variable to control the size of the welfare state.

9.3. Descriptive statistics

This section presents descriptive statistics about the main factors in this analysis. Figures 9-1 and 9-2 show the development of the MPR and that of the SPR.

The pension generosity score shows that there was no rapid reduction in generosity score in general. However, the direction of change is quite diverse according to country. In general, MPR showed a slight increase between 1980 and 2011 but each country showed a different trajectory. Portugal seems to be an outlier but MPR still increased without Portugal being included. Except for Portugal and Spain, most countries showed quite a stable trend. MPR consistently decreased in Sweden, Finland and Greece but increased in Norway, Ireland and Austria. Presumably, this difference can make a difference in income distribution as well. Regarding SPR, it looks less stable than MPR but the trend was also different according to country. In general, SPR slightly increased from 1980 to 2011. It decreased in Sweden and Germany and slightly increased in Norway and Finland. Consequently, the combination of MPR and SPR is different according to country. For instance, both MPR and SPR decreased over this period in Sweden even though the average benefit level is still considered relatively high compared with other countries. On the other hand, MPR decreased and SPR increased in Finland and both increased in Norway. In brief, both MPR and SPR slightly increased between 1980 and 2011, and the size of the increase was a bit higher in SPR than MPR. However, the actual trend is diverse and this diversity is expected to affect income inequality if the distributive effect of MPR and SPR is different.

Figure 9-1 Trend of first-tier pension program

Graphs by country

<Sources: Comparative welfare entitlement data set: http://cwed2.org/>
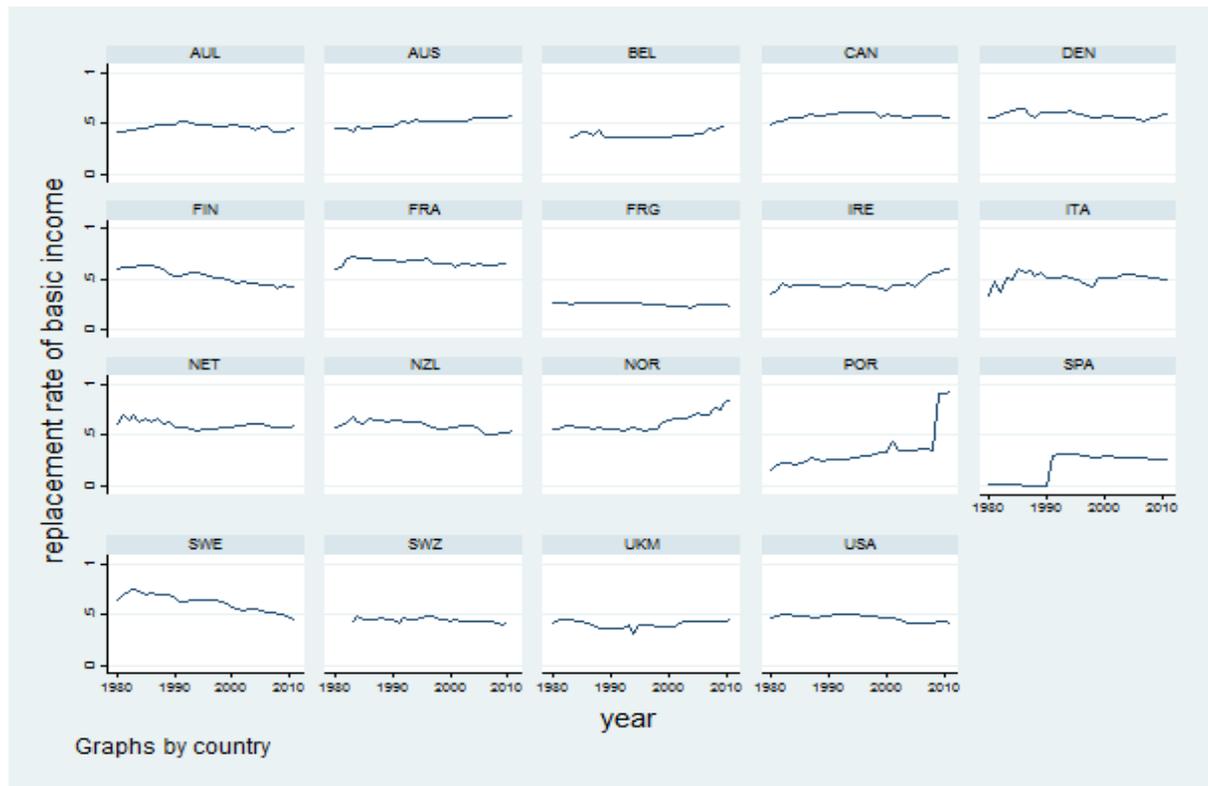
Figure 9-2 Trend of second-tier pension program

Graphs by country

<Source: Comparative welfare entitlement data set: http://cwed2.org/>
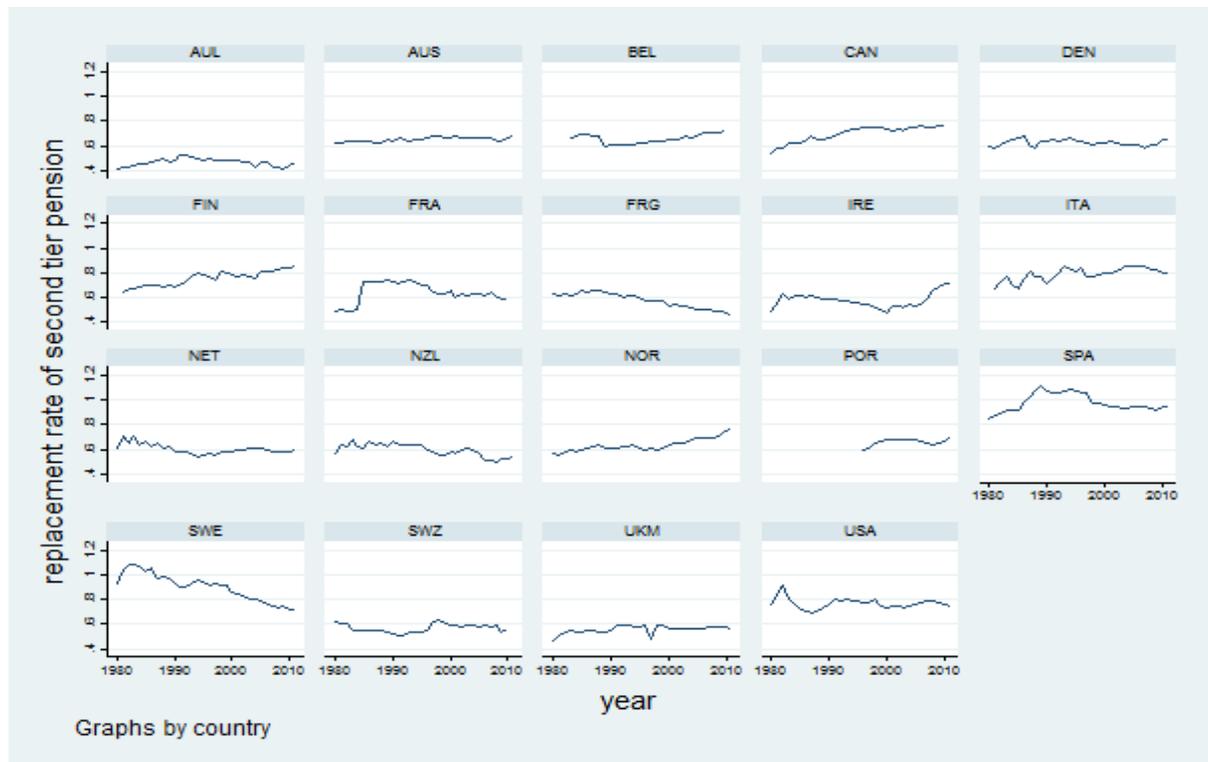
Table 9-1 summarizes the average value of SPR and MPR for each country for the three decades from 1980 to 2010. Generally speaking, SPR was likely to be higher than MPR in most countries. One exception is France, which had a higher replacement rate in minimum pension than in standard pension. Scandinavian countries tended to have high replacement rates in both pension programmes, whereas Anglo-American countries tended to have low replacement rates in both, and continental countries showed a medium level of benefit. Spain and Portugal are unique cases as they had generous benefit in standard pensions but the minimum pension was very low. Spain is the most diverse as it had the highest replacement rate in standard pension (98%) and the lowest replacement rate in minimum pension (19.2%). Among the continental countries, Germany had a relatively low level of replacement rate in the minimum pension programme. However, this was the average value of each pension programme, so it is necessary to see how these changed over time.

Table 9-1 Mean value of replacement rate

Country	Replacement rate of standard pension	Replacement rate of minimum pension
Australia	0.469	0.465
Austria	0.652	0.513
Belgium	0.657	0.394
Canada	0.699	0.578
Denmark	0.628	.586
Finland	0.755	.529
France	0.643	0.670
Germany	0.577	0.258
Greece	-	.411
Ireland	0.579	0.460
Italy	0.790	0.511
Netherlands	0.6029	0.6029
New Zealand	0.597	0.596
Norway	0.637	0.6255
Portugal	0.662	0.348
Spain	0.980	0.192
Sweden	0.900	0.616
Switzerland	0.567	0.445
UK	0.559	0.405

USA	0.766	0.466
Average	0.6695	0.4835

<Sources: Comparative welfare entitlement data set: http://cwed2.org/>

Correlations between the Gini coefficient, the proportion of private pensions, SPR and MPR are summarized in Table 9-2. We can see immediately that MPR has a significant negative relationship with Gini coefficient, but that SPR does not have a significant relationship with Gini coefficient among the elderly. In other words, MPR has a negative relationship with inequality and SPR does not have a significant relationship with inequality. The interesting thing is that MPR has a positive relation with private pensions, which means that private pensions increase when MPR increases. On the other hand, SPR has a negative relation with private pensions. This implies that an increase in benefit level in second-tier programmes is negatively associated with the size of private pensions. This is in line with the argument that a generous benefit in public pension makes private pensions less attractive so the demand for private pensions decreases. A negative correlation between MPR and private pensions is not straightforward to interpret, but it would be plausible if the government attempts to increase MPR when it expands the private pension market to prevent an increase in income inequality. This is a just correlation between two variables without considering the effect of other variables but it shows an interesting idea and gives us some hint of the main analysis.

Table 9-2 Correlation coefficient income inequality, Private pension, MPR and SPR

	Gini among elderly	Share of private pension	MPR	SPR
Gini among elderly	1.000			
Share of private pension	.0483 (.4974)	1.000		
MPR	-.2810*** (0.00)	.1616*** (.0002)	1.000	
SPR	-.0970 (.1762)	-.2043*** (0.000)	-.0541 (-.1953)	1.000

9.4. The effect of private pensions and the benefit level of the public pension

9.4.1. The effect of private pensions and benefit level

This section will test hypotheses 1 and 2, which are related to the relationship between private pensions and the benefit level of a public pension system measured as replacement rate. As shown in the previous chapter, it was expected that the effect of the benefit level of a public pension system can be different in the two tiers. The models in this section employ the same control variable as the previous models but there are some changes. The welfare generosity variable is now divided into three parts. As stated above, this section tests the relationship between the benefit level of a pension and income distribution among the elderly, so pension generosity should be separated from other welfare generosity scores. The welfare generosity score without a pension programme is included as a control variable since another welfare programme can still affect income distribution. The fixed-effect, random-effect and multi-level models were employed for the analysis. Tables 9-3 to 9-5 show the results of the analysis without the interaction variable first.

Table 9-3 The effect of replacement rate: fixed effect

Variable	Model 1: Fixed effect model		
	1st tier program only	*2nd tier program only*	*Both program together*
Share of elderly population over 65 years old	-.1425636 (-.62)	-.0146827 (-.08)	.0053808 (-.04)
Labour Market participation rate of elderly	.0023746 (1.52)	.0030454 (1.88*)	.0028651 (1.90*)
Real GDP per capita	-8.30e-08 (-.20)	-1.58e-07 (-.29)	-3.07e-07 (-.74)
Openness of Capital Market	.0008954 (.12)	.001584 (.21)	.0060224 (1.15)
Relative size private pension	-.0327773 (-2.60**)	-.0180202 (-1.20)	-.0205449 (-1.64)
Size of welfare state	-.0067447 (-3.34***)	-.0045837 (-2.44**)	-.0038914 (-2.50**)
Benefit level (1st tier program)	-.0582613 (-1.71)		-.0458409 (-2.01*)
Benefit level (2nd tier program)		-.1122176 (-2.88***)	-.0840391 (-2.43**)
Constant	.4520026 (6.59***)	.4281416 (7.40***)	.4133292 (10.27***)
Observations	171	166	165
Clusters	19	18	18

Table 9-4 The effect of replacement rate: random effect

Variable	Model 2: Random effect model		
	1st tier program only	2nd tier program only	Both program together
Share of elderly population over 65 years old	-.1053169 (-.96)	.0459908 (.42)	.0137935 (.14)
Labour Market participation rate of elderly	.002697 (3.47***)	.0029088 (3.81***)	.0028158 (3.90***)
Real GDP per capita	-1.08e-07 (-.31)	-1.71e-07 (-.52)	-3.11e-07 (-.99)
Openness of Capital Market	.0018809 (.50)	.00212 (.61)	.0060293 (1.73*)
Relative size private pension	-.0362893 (-3.70***)	-.0271342 (-2.70***)	-.0263141 (-2.78***)
Size of welfare state	-.0061016 (-7.50***)	-.0052716 (-6.11***)	-.00466 (-5.62***)
Benefit level (1st tier program)	-.061542 (-4.16***)		-.0493454 (-3.54***)
Benefit level (2nd tier program)		-.0943052 (-4.66***)	-.0702323 (-3.54***)
Constant	.4417249 (17.44***)	.4312659 (16.04***)	.4280755 (16.69***)
Observations	171	166	165
Clusters	19	18	18

Table 9-5 The effect of replacement effect: multilevel model

Variable	Model 3: within-between country model					
	1st tier programme only		2nd tier programme only		Both programme together	
	Within	Between	Within	Between	Within	Between
Share of elderly population over 65 years old	-.1090998 (-.85)	-.601224 (-1.58)	.0032199 (.03)	-.3964568 (-.93)	-.0023235 (-.02)	-.3608126 (-.92)
Labour Market participation rate of elderly	.0029958 (3.67***)	-.002738 (2.19**)	.0032934 (4.08***)	.0035806 (2.98***)	.0029471 (3.84***)	.0039374 (3.54***)
Real GDP per capita	-2.38e-07 (-.69)	-1.67e-07 (-.11)	-2.45e-07 (-.76)	-1.50e-06 (-1.04)	-4.61e-07 (-1.49)	9.78e-08 (.07)
Openness of Capital Market	.0025174 (.68)	.0110301 (.75)	.0026965 (.79)	.0247909 (1.63)	.0073144 (2.14**)	-.0106998 (.71)
Relative size private pension	-.0320323 (-2.72***)	-.084189 (-2.48**)	-.015704 (-1.35)	-.1044192 (-3.12***)	-.0149875 (-1.38)	-.0763286 (-2.36**)
Size of welfare state	-.006623 (-6.21***)	-.005763 (-5.01***)	-.004189 (-3.74***)	-.0067268 (-5.44***)	-.0036094 (-3.45***)	-.0062435 (-5.08)
Benefit level (1st tier program)	-.0539115 (-3.53***)	-.11140 (-2. 52**)			-.043732 (-3.04***)	-.1006499 (-2.18**)
Benefit level (2nd tier program)			-.116839 (-3.12***)	-.0369639 (-.79)	-.0882222 (-4.07***)	-.0442356 (-1.02)
Constant	. (8.02***)		.4950639 (6.93***)		.5030352 (7.63***)	

Observations	171	166	165
Clusters	19	18	18

There are some differences between the fixed-effect model and the random-effect model. As expected, the benefit level of the first-tier programme has a significant effect on income inequality except in Model 1. The benefit level of the second-tier programme shows quite a significant effect on income inequality. In addition, the effect of private pensions becomes insignificant when the benefit level of the second-tier programme is put into the model. It can be argued that this is in line with the argument that a generous public pension programme can make private pensions less attractive so the effect becomes insignificant. When the benefit levels of both programmes are considered, both are significant and private pensions are insignificant. In addition, the size of the coefficient is higher for the second-tier programme than for the first-tier programme, which implies that an increase in benefit level in the second-tier programme has a bigger effect on reducing inequality. In other words, an increase in the benefit level in the second-tier programme can be a better strategy for tackling inequality among the elderly, rather than in the first-tier programme. However, the random-effect model shows something different. It shows that the benefit level of the first-tier programme has a significant effect on the decrease in income inequality as well, and private pensions still have a significant effect on the decrease of income inequality when the benefit level of the second-tier programme is considered. But this model also shows that an increase in benefit level at the second tier has a bigger effect on income inequality than in the benefit level at the first-tier programme, although an increase in benefit level at the first-tier programme also has a significant effect on income inequality.

As stated in the methodology chapter, the fixed-effect model is likely to produce more rigorous results than the random-effect because of the unrealistic assumptions of the random-effect model. There is no time-invariant variable in this model but the benefit level of the first-tier programme is quite stable in most countries and the benefit level of the second-tier programme is also stable for some countries. As explained in the methodology chapter, the multi-level model is also useful when the variable is sluggish because it does not change rapidly over time. So Model 3 shows the results of the multi-level analysis. There are several things to be noted in this model. Unlike the fixed-effect model, it shows that an increase in benefit level at the first-tier programme also has a

significant effect on decreasing income inequality. This is significant for both within-country and between-countries. An increase in benefit level at the second tier is significant within-country, but it is not significant in-between countries. In other words, we can see that income inequality decreases as the benefit level of the second-tier programme increases in one country, but at the same time we can see countries with a higher level of benefit level do not have lower levels of income inequality. On the other hand, private pensions have the opposite effect. Namely, an increase in private pensions in a given country does not have a significant effect on income inequality but countries with high levels of private pension are likely to have lower levels of income inequality. This result is the same when the benefit level of both programmes is considered. Only the benefit level of the first-tier programme has a significant effect in a given country as well as between countries. However, it should be kept in mind that we need to concentrate more on the within-country effect as the between-countries effect is likely to suffer from omitted variables bias (Shalev, 2008). This model still shows that an increase in replacement rate at both tiers is significantly related to a decrease in income inequality, and an increase in replacement rate for the second-level programme has a larger effect on a decrease in income inequality. A 1% increase in MPR is related to a decreasing in the Gini coefficient of 0.044 whereas a 1% increase in SPR is related to decreasing the Gini coefficient by 0.088.

These results show that the effect of private pensions can be different in the context of a given country. In addition, an increase in the benefit level of the second-tier programme can be a good strategy but it does not consider the interaction effect between private pensions and the benefit level of the public pension system. Now we can see the results of the analysis considering the interplay between private pension and benefit level.

9.4.2. The effect of private pensions and benefit level considering the interaction effect

Table 9-6 presents the results of considering the interaction between the benefit level of the public pension and private pensions. Model 4 shows the results of the fixed- and random-effect models and Model 5 shows the result of the multi-level model.

Table 9-6 The effect of replacement rate: interaction with private pension

Variable	Model 4		Model 5	
	Fixed effect model	*Random effect model*	*Within-country effect*	*Between country effect*
Share of elderly population over 65 years old	.0206634 (.19)	.0169276 (.17)	.1308225 (1.17)	-.4038968 (-1.01)
Labour Market participation rate of elderly	.0017428 (1.57)	.0019342 (2.66***)	.0028891 (3.87***)	-.0016561 (1.41)
Real GDP per capita	9.34e-08 (.23)	3.29e-08 (.11)	-2.63e-07 (-.89)	2.07e-07 (.14)
Openness of Capital Market	.0039769 (.81)	.0044729 (1.34)	.0059564 (1.84*)	.100115 (.65)
Relative size private pension	.0642694 (1.04)	.0528113 (1.06)	-.0303807 (-2.75***)	-.080389 (-2.44**)
Size of Welfare state	-.0043325 (-3.61***)	-.0046876 (-5.69***)	-.004437 (-4.28***)	-.0057716 (-4.74***)
Benefit level (1st tier program)	-.0279597 (-2.37**)	-.0287302 (-2.08**)	-.0510962 (-3.44***)	-.1033959 (-2.19**)
Benefit level (2nd tier program)	-.0584852 (-1.80*)	-.0570655 (-2.19**)	-.0577427 (-2.67***)	-.0397565 (-.90)
Private pension 1st tier program*	-.280731 (-5.22**)	-.2774798 (-4.59***)	-.8758806 (-2.40**)	
*Private pension * 2nd tier program*	.0719153 (.76)	.0835464 (1.23)	1.06844 (4.22***)	
Constant	.3966313 (9.06***)	.4098032 (13.59***)	.5156772 (7.67***)	
Observations	165	165	165	
Clusters	18	18	18	

The core variables which we are interested in show similar results across the models. Both the fixed-effect model and the random-effect model show that the interaction between SPR and private pension does not have a significant effect on income inequality. In other words, an increase in benefit level at the second-tier programme has the effect of decreasing income inequality, but an increase in private pensions does not have a significant effect on moderating the effect of the pension benefit. In addition, both models show that private pension does not have a significant effect on income inequality. However, an increase in MPR is significantly related to a decrease in income inequality, and the size of effect is larger when it is combined with private pensions. Namely, the effect of MPR on reducing income inequality is larger when private pensions increase. This means that an increase in benefit level at the first-tier programme can be a relevant policy measurement to tackle an increase in income inequality under the condition that private pension prevails.

The multi-level model shows a slightly different result. The effect of the benefit level at the first-tier programme is the same but an increase in private pensions has a significant effect in decreasing income inequality. More importantly, the interplay between the variables shows an interesting result. It is the same in that an increase in benefit level at the first-tier programme has a significant effect on decreasing income inequality and its effect is magnified when it is combined with the expansion of private pensions. However, an increase in benefit level at the second-tier programme, which decreases income inequality in a given country, is associated with an increase in income inequality when private pensions are expanded. In other words, an increase in benefit level at the second-tier programme is normally associated with a decrease in income inequality, but it increases income inequality when it is combined with private pension. This implies that an increase in benefit level at the second-tier programme is not a relevant strategy when private pensions are expanded. As stated in the previous section, this study tried different models such as the two-way fixed-effect model and Jackknife analysis, but the results remained the same Results are available in Appendix B.1 and B.2.

In brief, these results show that an increase in benefit level at the first-tier programme generally has a significant effect on decreasing income inequality among the elderly, and its effect gets stronger when the proportion of private pensions expands. This study proposed several hypotheses based on previous studies before the main analysis was presented. The results of the analysis are in line with the expectations proposed. An increase in benefit level at the first-tier programme decreases income inequality among the elderly, and this effect is magnified when private pensions expand. On the other hand, an increase in benefit level at the second-tier programme also has an effect of decreasing income inequality, but its effect is restricted when private pensions expand. In fact, the effect of an increase in SPR could be cancelled out when the proportion of private pensions increases.

The other variables show almost the same direction and significance as the models in the previous chapter. The elderly labour market participation rate is significantly related to an increase in income inequality, and the size of the welfare state decreases income inequality. The openness of the capital market has a significant effect on increasing income inequality within a country, but the between-countries effect is not significant.

GDP per capita also shows no significant relationship with income inequality among the elderly.

9.5. Discussion

Many studies have argued that a generous benefit level of the public pension decreases income inequality and limits the expansion of private pensions in general. However, the structure of the benefit level in the public pension is not simple so it requires a more rigorous approach. Generally, the benefit of a public pension consists of a two-tier system which reflects different dimensions.

This study assumes that each level has a different effect on income distribution and that the interplay with private pensions is also different. Considering the nature of each programme, the first-tier programme is expected to have a more salient effect on income inequality, as the first-tier programme reflects the redistributive dimension whereas the second-tier programme reflects the income security dimension. Previous models have shown that an increase in private pensions is related to a decrease in income inequality when it is combined with a high coverage rate. Based on this finding, it is expected that an increase in benefit level at the first-tier programme is associated with a decrease in income inequality and that its effect gets stronger when it is combined with an expansion of the private pension. The results from Models 1 to 5 support this assumption.

This shows that an increase in benefit level at the first-tier programme has a significant effect on decreasing income inequality alone, and that its effect is magnified when the interaction between private pensions and benefit level is considered. The poor, who are unlikely to have a proper employment history or sufficient income and so are likely to be excluded from the second-tier pension programme, can still approach the first-tier programme. This means that an increase in private pensions does not cause many problems for income distribution as long as the poor are protected by a generous first-tier programme. On the other hand, an increase in benefit level at the second tier is related to a decrease in income inequality alone, but it increases income inequality when private pensions increase. The second tier reflects the employment history of individuals so it is normally less redistributive than a first-tier programme. Thus, a high benefit level at the second tier means that the rich are likely to have more income from their pension than the poor, as income level during working life is to be maintained even after retirement.

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The expansion of private pensions under this circumstance leads to benefit for the rich, so income inequality increases as a result if the poor are not sufficiently supported by the public pension system.

Considering the fiscal burden on the government because of an aging population, it looks reasonable to reduce the benefit level and expand private pensions, but the reduction in benefit level should be specified.

Chapter 8 showed that securing a high coverage rate is important for relieving income inequality so it is important for the poor to be covered by the public pension system when the proportion of private pensions increases. This current chapter shows that an increase in benefit level at the first tier has a better effect on reducing income inequality than an increase in the benefit level of a second-tier programme, particularly when the proportion of private pensions increases.

A concrete policy guide cannot be proposed from a single empirical research study but this study does provide some broad policy implications. A reduction in benefit level at the second tier combined with expanding private pensions would be fine in terms of income distribution but a reduction in benefit level at the first tier could bring about a harmful effect on income distribution. As shown in the descriptive statistics, the detailed trajectory and combination of the two-tier system differs from country to country. According to the results of this study, the best combination to achieve reform policy is to expand private pensions, reduce the benefit level of the second-tier programme and provide a generous first-tier pension system with universal coverage.

9.6. Conclusion

The starting point of this study was how the welfare state copes with an aging population in the era of transformation and this research has attempted to examine the relationship between current pension reforms and the distributive outcome. We assume that new policy instruments are closely related to the existing welfare state, so this thesis particularly focuses on the interaction between private pensions and the institutional design of the public pension system.

The results of this study show that delaying retirement has a negative effect on income inequality, and although the effect of private pensions is complicated to interpret, it

shows that the effect of private pensions is determined by the relationship with the public pension system. An increase in private pensions is related to a decrease in income inequality among the elderly in general, but its effect differs according to the institutional design of the public pension system. It is related to an increase in income inequality in countries with strong earnings-relatedness and a low coverage rate system, and to a decrease in income inequality in the other two groups. These results show that an expansion of private pensions is not necessarily related to an increase in income inequality. In addition, they support the argument that universal coverage is more salient for achieving better income distribution than earnings-relatedness. This implies that it is important for the poor to be covered by the public pension system. The analysis in this chapter also shows that the distributive effect of a generous first-tier programme is larger than that of a second-tier programme when the proportion of private pensions increases.

This study raises some important policy implications. An increase in private pensions does not bring an increase in income inequality if the public pension has a relevant institutional design to moderate the effect of private pensions. Strong earnings-relatedness can be effective for restraining an increase in private pensions, but restraining private pensions is not necessarily related to restraining income inequality. On the other hand, income inequality decreased when private pensions increased in countries with a high coverage rate. It can be inferred that securing a high coverage rate is more important than strong earnings-relatedness in terms of better income distribution. It is therefore important to secure wide coverage of the public pension if the government wants to introduce or expand the private pension market.

In this regard, it is expected that the benefit level of the public pension at the first tier matters in income distribution. An increase in benefit level at the second tier, as well as the first tier, is related to a decrease in income inequality but this relationship is slightly different when the interaction between the benefit level of the public pension and the proportion of private pensions is considered. The size of the effect is larger for the first-tier programme when the proportion of private pensions increases, but the effect on the second-tier programme is canceled out.

The most important thing that determines the effect of private pensions seems to be whether the poor can be covered by the public pension or not. Universal coverage and a generous benefit level at the first tier are related to the protection of the poor. The

reason why various studies have argued that private pensions have a negative effect on income distribution is based on the idea that only the rich can get additional benefit from a private pension on the top of public pension and the poor cannot afford a private pension. However, what the findings of this study suggest is that this additional benefit for the rich is not related to an increase in income inequality if a sufficient level of public pension is provided to the poor.

The findings also raise a fundamental question on the role of private pensions on income distribution as private pensions have mostly been considered to have a negative effect on income distribution. However, the findings suggest that private pensions do not have a negative effect on income distribution. On the other hand, a private pension could have a positive effect if a relevant public pension system is established. Thus, the introduction of a private pension system should be dealt with very carefully and should be accompanied by reform of other components in the public pension system.

Additionally, the findings propose an answer to the question of which institution is most relevant for better income distribution. There has been a long debate on the distributive outcome of universalism versus targeting and earning-relatedness versus a flat rate. Certainly, the findings of this study provide some clues only and not a clear answer to those questions as this study has only considered the role of the institutional design of a public pension system in the context of expanding private pensions. Regarding the universalism versus targeting argument, the findings are more supportive of universalism as they showed better income distribution in countries with a wider coverage rate of the public pension system. It is not clear on the issue of earnings-relatedness versus flat rate. Strong earnings-relatedness did not show a significant effect on decreasing income inequality and the result was inconsistent when it was combined with an increase in private pensions. In other words, strong earnings-relatedness did not have a significant effect on decreasing income inequality by itself and did not show a significant effect on moderating the effect of private pensions. However, the findings showed no evidence that a flat rate is more efficient at reducing income inequality.

The expansion of private pensions is a prevalent phenomenon across the developed world as countries face an increase in the financial burden on government due to low fertility rates and aging populations. The results of this study suggest that the role of the

public pension is still very salient to minimizing the negative effect and maximizing the positive effect of private pensions in terms of income distribution.

Chapter 10. How are ALMPs related to income inequality?

10.1. Introduction

Previous chapters have examined the relationship between pension reform and income inequality, focusing on the effect of private pensions and their interplay with the institutional design of the public pension. It has been shown how an increase in private pensions affects income inequality among the elderly. However, the previous chapters have dealt only with income inequality among the elderly, so it is still necessary to examine the effect of welfare reform on income distribution among the working-age group to see the whole picture of how welfare reform affects income inequality in general. Therefore, this chapter explores the relationship between welfare reform and income inequality among the working-age group. As explained in the literature review, new risks related to labour market changes are emerging, such as globalisation and increased flexibility in the labour market. These changes affect the risk of unemployment for unskilled workers particularly, so this leads to changes in the social protection that the government provides for the unemployed.

The way welfare states respond to the new risks is more focused on the prevention of unemployment by increasing the capacity of workers to adapt to the changes (Jenson & Saint-Martin, 2003). Welfare states provide not only financial support to the unemployed but also have more active policies to increase their skill, knowledge and capacity in order to help them to stay in work and reduce the time spent on searching for new jobs. These active social policies to deal with new risks in the labour market are called Active Labour Market Policies (ALMPs). ALMPs help the unemployed to increase their chances of finding new jobs and help the government to reduce its financial burden by reducing the time spent on job searching as government spending on unemployment benefit can be reduced as well.

As explained in the literature review, ALMPs are considered to be the cornerstone of active social policy and this transition from redistributive social policies to active social policies is expected to bring better social inclusion and better income inequality. Vanhoudt (1997) argued that the development of technology leads to economic growth but it is likely to be related to an increase in income inequality. He argued that low-skilled workers tend to be replaced by advanced technology and only the rich can get any

benefit from technological developments as they can reduce the cost of the labour force so income inequality would increase. However, ALMPs can cancel the effect of technology on income inequality because they provide an opportunity for low-skilled workers to upgrade their skills and knowledge since without this opportunity they are likely face unemployment due to advancing technology. Vaalavuo (2013) argued that social investment including ALMPs is related to the distribution of opportunity rather than of income, so it would be less distributive than the traditional welfare state. However, she argued that it still has an impact on income inequality as it may serve some income classes more than others.

However, as discussed in Chapters 6 and 7, some researchers have argued that active social policies are partially responsible for the current failure to achieve poverty reduction (Cantillon 2011; Vandenbrouke & Vlemincks 2011). In fact, empirical studies of the redistributive effect of ALMPs are limited. Most of the studies have focused on one or two countries so it is difficult to see the general effect of active social policies on income distribution. Vanhoudt (1997) examined the effect of ALMPs on income inequality using data from eleven developed countries but did not find a significant relationship between ALMPs and income inequality. Vliet and Wang (2015) showed that social investment did not have a significant relationship with poverty reduction in fifteen European countries.

As shown in the case of public pensions, new policy instruments do not exert their influence on distributive outcomes alone but are closely related to the already existing traditional welfare state institution. It is therefore very important to consider the effect of unemployment benefit on income distribution and its interplay with ALMPs as well before looking into the distributive effect of ALMPs, as explained in Chapter 7.

Some studies have argued that a generous unemployment benefit is associated with a decrease in poverty (Palme 2006; Scruggs 2006). Those studies emphasised the institutional design of unemployment benefit, such as how replacement rate, duration and targeting/universalism affect income distribution. However, it is more complicated when the interaction between unemployment benefit and ALMPs are focused on. Many studies have argued that a generous unemployment benefit contributes to raising the equilibrium of the unemployment rate and deteriorates the speed of the labour market's ability to adjust to economic shock (Carrasco, 1999; Calmfors & Skedinger, 1995; Scarpetta, 1996). Hofmann (2008) and Van den Berg *et al.* (2004) showed that the

imposition of sanctions on unemployment benefit has a significant effect on reducing the duration of unemployment.

In other words, previous studies have shown that a generous unemployment benefit is useful for reducing poverty but at the same time, it has an arguably significant effect on keeping the unemployed in unemployment for longer. Røed and Westlie (2012) insisted that a generous replacement rate of unemployment benefit is related to the moral hazard problem, which means that the unemployed do not do their best to find a job because of a generous unemployment benefit. Considering that ALMPs are intended to return the unemployed to the labour market, those studies have suggested that a generous unemployment benefit is likely to have a bad effect on the employment rate, unlike ALMPs. However, as was shown in Chapter 7, the notion of flexicurity and the case of Denmark show that a generous unemployment benefit combined with ALMPs can lead to better results in increasing employment and this can be related to lower poverty and lower income inequality. It can therefore be inferred that the effect of ALMPs can be different according to the institutional design of unemployment benefits.

Along with unemployment benefit, this current study also considers minimum income programmes (MIPs, hereafter) as a traditional social policy to affect income distribution among the working-age population. The goal of MIPs is to provide comprehensive protection as a last safety net for when social benefits are exhausted or they do not provide a sufficient social minimum. As MIPs are the last safety net for the unemployed, so it can be inferred that they affect income inequality as well. In addition, the form of MIP varies from country to country so the effect of MIPs on income distribution also can be different according to the policy structure of the MIP. Thus, this current study will attempt to classify the institutional design of unemployment benefit in conjunction with MIPs in order to find out how different policy structures of unemployment benefit and MIPs can affect the impact of ALMPs on income inequality.

So this chapter will examine the effect of ALMPs and their interaction with traditional passive social policy on income inequality among the working-age by using time-series data from around twenty developed countries. This chapter is structured as follows. Section 10.2 focuses on the classification of the institutional design of unemployment benefit. In particular, a classification based on universalism/targeting is proposed and hypotheses to be tested are put forward. Section 10.3 explains what variables were used

and how they can be defined. Section 10.4 presents descriptive statistics and the results of main analysis and Section 10.5 contains a discussion and conclusion.

10.2. Classifying the policy structure of unemployment benefit

There are various components which have to be considered for the classification of policy structure but it is not easy to consider them all at the same time. Things to be considered include deciding how much unemployment benefit is generous as a replacement rate, qualifying period, duration and eligibility. It is also necessary to consider how an MIP is structured and the relation between the MIP and unemployment benefit. As stated above, the policy structure of an MIP varies from country to country so it is quite complicated to classify unemployment benefit and MIP at the same time. In addition, there have not been many studies which have clearly shown which parts or components in unemployment benefit or MIPs are related to effect of ALMPs, so this thesis employed criteria that are frequently used as measurements of the generosity of unemployment benefit (Scruggs, 2013).

This study considers unemployment benefit first, and then considers the features of MIPs. The classification starts with the question of whether there is an earnings-related unemployment benefit or not. Questions should reflect the conceptual dimension that we want to capture. Based on the discussion of universalism versus means-testing, earnings-related unemployment benefit, flat rate or means-tested should be the first question to be asked. The second and third questions are also frequently used to measure the generosity of unemployment benefit: they are the qualifying period and the duration of unemployment benefit. Generally, a short qualifying period and a long duration are considered as generous unemployment benefits. These three questions are the criteria for classifying unemployment benefit.

Regarding the main features of MIPs, the critical dimensions in MIPs need more explanation. As stated in the introduction to this chapter, MIPs are quite diverse between countries and there are also various components used to construct MIPs, so it is not easy to decide what components are important for determining the institutional characteristics of MIPs.

Some previous studies have attempted to classify the structure of MIPs. Various dimensions have been considered as salient for capturing the characteristics of MIPs.

Lødemel and Schulte (1992) used whether or not social work/treatment measures are attached to the receipt of assistance and the degree of programme centralisation as salient dimensions that need to be considered. Gough *et al*. (1997) elaborated this and proposed extent, structure and generosity as the main dimensions. Extent is measured as expenditure on social assistance and the number of beneficiaries, and generosity is measured as benefit level and replacement rate. The structure is a bit more complicated; it reflects the main structure of programmes such as centralisation versus local variation, right to benefit versus discretion and individual versus family obligation. Gough *et al*. (1997) proposed eight regimes based on these criteria. Hölsch and Kraus (2004; 2006) also attempted to identify regimes across different countries and used expenditure, generosity, the degree of targeting and duration.

This thesis attempts to classify the institutional design of MIPs based on some of the criteria used in previous studies. The first question is the existence of MIPs at the national level. If a country has MIPs at the national level, then the subsequent questions are whether they are supplementary to unemployment benefit and whether they require any conditions, such as job search or vocational training. The first question is related to the structure of MIPs in terms of whether or not a centralized programme exists, which has been frequently used as the main dimension in previous studies. The second question is to find the relationship between MIP and unemployment benefit. Bahle, Hubl and Pfeifer (2011) argued that an MIP is likely to be residual and supplementary when there is sufficient income support from a generous social insurance system.

The third question is the relationship between MIPs and ALMPs. In general, the second and third questions are related to the scope and extent of MIPs. Those dimensions are expected to act as moderators for the effect of ALMPs and unemployment benefit on income distribution. MIPs are likely to be more inclusive if they do not have any conditions attached or if the unemployment benefit is less generous. The selected criteria for this new classification are summarized in Table 10-1.

Table 10-1 Items in unemployment benefit and MIPs

Unemployment benefit	MIPs
1) Main unemployment benefit is earning-related?	1) MIPs exist at the national level?

2) Qualifying period of unemployment benefit	2) Are MIPs supplementary to unemployment benefit?
3) Duration of unemployment benefit	3) MIPs require job search or vocational training?

This study employed data on the policy structure of unemployment benefit and MIPs from MISSOC 1996 to 2010 for European countries and from social security policies throughout the world for non-European countries. Except for questions 2 and 3 in unemployment benefit, others questions required a simple 'yes' or 'no' answer. Questions 2 and 3 are measured as the number of weeks. Data on qualifying period and duration came from the Comparative Welfare Entitlement Dataset compiled by Scrugg *et al*. (2013). One of the primary goals of this current study is to examine empirically the effect of universalism and means-testing. Therefore, the most critical question is question 1 in both unemployment benefit and MIPs.

Based on the six questions, five model types are proposed.

Type 1 is called Basic Security-Targeted model. Countries in this type do not have an earnings-related unemployment benefit. Australia and New Zealand have means-tested benefit systems and the UK and Ireland have flat-rate unemployment benefits.

Type 2 is called Citizenship model. Countries in this type have earnings-related unemployment benefit with a relatively short qualifying period and a long duration. Countries in this type also have a supplementary MIP that is designed to top-up payment as unemployment benefit. Scandinavian countries except for Denmark fall into this type, and Switzerland, Luxembourg and the Netherlands are also included in this type.

Type 3 is called the Hybrid model. It contains earnings-related unemployment benefit with a relatively short qualifying period and MIPs that are not supplementary. Countries in this type normally have conditions suitable for an MIP, such as the obligation to exhaust maintenance claims or other benefits prior to receiving social assistance. However, countries in this type have diversity in the duration of unemployment benefit. Denmark, Portugal and Spain have much longer durations than Canada.

Type 4 is labelled Residual model. Countries in this type have earnings-related unemployment benefit with a long qualifying period and a short duration. Their MIP is not

supplementary so it acts as a last safety net when other benefits are exhausted. France, Germany and Austria fall into this type.

Type 5 is Local MIP. It comprises countries which did not have unemployment benefit or national MIPs prior to 2010. There are three countries in this type, and each of them has a different kind of support system. Italy has a social allowance which is available only to recipients older than 65 who have no other income, and it also has some income support at local government level. Greece has had a social solidarity allowance since 2009. It was introduced in response to the 2008 financial crisis and supports families with very low income and other vulnerable social groups. The United States has a supplementary security income which is means-tested assistance at federal level.

Table 10-2 Structure feature of unemployment benefit and minimum income programme

Model	Countries	Key structure
Basic Security-targeted	Australia New Zealand, The United Kingdom, Ireland	1) Absence of earning-related unemployment benefit 2) Either means-tested or flat rate benefit exists
Citizenship	Finland, Sweden, Norway, Luxemburg, Switzerland, Netherlands	1) Earing-related benefit with short qualifying period and long duration 2) Supplementary MIP on the top of unemployment benefit
Hybrids	Denmark, Portugal, Spain Canada	1) Earning-related benefit with short qualifying period 2) MIP that are not supplementary 3) Duration is various
Residual	Belgium France Germany Austria	1) Earning-related benefit with long qualifying period and short duration 2) MIP that are not supplementary

Local MIP	United States	1) No unemployment benefit or MIP at the national level.
	Greece	
	Italy	

As stated above, ALMPs improve the employment rate by providing various services to help the unemployed re-enter the labour market, but their effect can become weak when the unemployment benefit is very generous. In this regard, the effect of ALMPs on income distribution, whether it is positive or negative, can be weak in countries with more generous unemployment benefit and can be more significant in countries with less generous unemployment benefit. Of the five models, it seems that the Basic Security - Targeted model and the Local MIP model are less favourable for the unemployed, and that the Citizenship model is more favourable for the unemployed. The most distinctive difference of Basic security-Targeted model from the other models is that they have no earnings-related unemployment benefit. Citizenship model and Residual model are similar as both have an earnings-related unemployment benefit although the details are a bit different. The difference between Citizenship model and Residual model is the nature of the MIP, which is supplementary in Citizenship model and not in Residual model. Countries in Hybrid model do not fall into a clear ideal type so they are called Hybrids.

This study assumes that the institutional design of unemployment benefit and MIP affects income distribution. As shown above, a generous system is expected to have a lower level of income inequality. Thus, Citizenship model is expected to have the lowest level of income inequality and Residual model is also expected to have a lower level of income inequality. In contrast, Basic security-targeted model and Local MIP model are expected to have higher levels of income inequality compared with the other models.

Regarding the interaction between ALMPs and the institutional design of unemployment benefit and MIPs, previous studies of the distributive outcome of ALMPs have not provided a clear answer. Therefore, this thesis is an exploratory analysis of this relationship. This thesis assumes that an increase in ALMPs is associated with a decrease in income inequality by helping the unemployed to get jobs and income. This study will propose preliminary hypotheses and will attempt to determine the distributive effect of ALMPs.

The previous chapter showed a clear interactive effect in the case of pensions so it is worth exploring whether a similar interaction exists in the relationship between

unemployment benefit and ALMP. This study therefore proposes the hypothesis that the effect of ALMPs can be different according to the institutional design of unemployment benefit and its combination with an MIP. The effect of ALMPs is stronger in the Local MIP model and the Basic security-Targeted model as these models are relatively less generous in general than the other models, and it is weaker in Citizenship model as this type is relatively more generous than the other models. In other words, if ALMPs are associated with a decrease in income inequality, then the size of the reduction in income inequality is larger in Basic security-Targeted or Local MIP and it is at a modest level in the other models.

There are two points that we need to focus on. The first is the difference between Local MIP model and the other models. As shown in Table 10-2, the three countries in Type 5 do not have unemployment benefit or MIPs at the national level whereas the other models have a protection system at the national level despite all the differences in their programme structures. It is expected that the existence of a national level protection programme makes a difference in the effect of ALMPs on income inequality. The second point is the difference between Basic security-Targeted model and Citizenship, Residual, and Hybrid. The distinctive difference is that countries in Basic security-Targeted model have a means-tested or flat-rate unemployment benefit whereas countries in Citizenship, Residual, and Hybrid model have an earnings-related unemployment benefit. As shown in the literature review, there is a debate on the advantages and disadvantages of the means-tested benefit system. Many studies have shown the limitations of the means-tested system and this current study is expected to show how a means-tested system interacts with ALMPs so that the income distribution changes.

Consequently, the hypotheses proposed in this study are as follows.

1) The institutional design of unemployment benefit and MIP has a significant effect on income distribution under the control of the other independent variables.

   1-1) Basic security-Targeted model and Local MIP model have higher levels of income inequality

   1-2) Citizenship model and Residual model have a lower levels of income inequality.

2) An increase in ALMPs is related to a decrease in income inequality in general under the control of the other independent variables.

2-1) The distributive effect of ALMPs is stronger in Basic security-Targeted model and Local MIP model.

2-2) The distributive effect of ALMPs is weaker in Citizenship model.

Details of the research model, variables, measurement techniques and data are described in the following section.

10.3. Model, variables, and data

The aim of this chapter is to examine the effect of active social policy on income inequality using data from the OECD social expenditure and income distribution database. The dependent variable in this analysis is income inequality measured by Gini coefficient. Unlike the analysis discussed in the previous chapter, this chapter uses the Gini coefficient among the working-age population (20-54 years old) as ALMPs are expected to affect income distribution mainly among this population. The main independent variable is government spending on ALMPs. ALMP data from the OECD covers various sectors such as employment services and administration, training, job rotation and job-sharing, employment incentives, supported employment and rehabilitation, and direct job creation. Government spending is shown as percentage of GDP. At the same time, traditional social expenditure is also included as a main independent variable. Data on social expenditure include various kinds of expenditure on social protection, such as pensions and sick pay. Thus, social expenditure is divided into two: spending on unemployment benefit and other social expenditure. Spending on unemployment benefit is expected to have a more direct effect on income distribution among the working-age population than other social expenditure. Generosity score is used in case of pension but this chapter employs expenditure as a measure because social expenditure captures more countries in the case of ALMPs. Although this chapter is based on expenditure measurement, sensitivity tests will be carried out on generosity scores.

As discussed in the literature review, a measurement based on expenditure has an obvious weakness in that it reflects only the financial aspects of social policy so the qualitative aspect and institutional characteristics cannot be reflected. Different types of active social policy can fall into same category and expenditure cannot reflect 'the effort' of the welfare state in some cases. For example, the UK shows a consistently low level of spending on ALMP but this does not include generalized wage subsidies in the form of tax

credits (Berry, 2014; Clasen, Clegg & Goerne, 2016). Apart from the weakness of expenditure measurement, OECD data sets of ALMP and social investment have further weaknesses which should be considered. First, OECD data for ALMPs cover only expenditure by central government but ALMPs are being decentralized in many developed countries (Clasen, Clegg & Goerne, 2016). For example, expenditure on employability provision in Scotland was financed by the Scottish government and the European social fund (around £70million) in 2012 but UK ALMP data in OECD and Eurostat does not include Scottish sub-national provision (Goerne & Clegg, 2013). Not only local government but also the private sector plays in important role in delivering ALMP. Many developed countries attempt to contract out of delivery of ALMPs to private providers and then control the efficiency and effectiveness (Sol & Westerveld, 2005). Sometimes, governments make 'black box' contracts which provide no prescription, policy instruction and grants discretion to a private provider. The UK work programme is an example of a black box contract (Finn, 2012). With the growth of local government and private providers of ALMPs, the OECD data set cannot precisely reflect the size and effort of the government and this can lead to distorted results in an analysis of its distributive effect.

However, internationally comparable data sets to reflect the quality of active social policy for the long term are not available. This study therefore used expenditure data despite acknowledging the weakness of expenditure based measurement, as OECD data are nevertheless the most reliable and comparable data set for the long term at the moment. It should therefore be kept in mind that the results of this study will not be decisive because of the OECD data issues explained above.

It is also very important to select control variables. As shown in the previous chapter, income inequality is the consequence of the complicated interplay between various economic and social factors. In particular, as Kersbergen and Hemerijck (2012) argued, the characteristics of the labour market are very salient. Many previous studies have shown which variables should be considered in research into income distribution. As explained in the previous chapter, GDP per capita should be included as a control variable. Variables related to globalisation, such as proportion of Foreign Direct Investment (FDI) or the openness of the capital market should also be included, but variables were not included in this study as they have shown a consistently insignificant effect on income inequality. The unemployment rate is also considered to be an important factor (Vliet &

Wang 2015). As discussed in Chapter 4, including the unemployment rate is done to control the demand side of unemployment benefit and ALMPs.

The age composition of the population is also reported to play a salient role in income distribution so the percentage of the population over 65 and the percentage of the population under 15 are also included. In addition, variables to account for labour market institution should be considered. This study used a variable measuring union density. Previous studies have shown inconsistent results of the effect of union density on income distribution. On the one hand, strong union density leads to high wages and less wage dispersion so it decreases income inequality. On the other hand, however, strong union density increases the difference between insider and outsider. This means that employees with permanent contracts enjoy protection and wage growth from strong union density, but entry to the labour market is more difficult for employees with temporary contracts or the unemployed. Union density data is also taken from the OECD data set. Table 10-3 shows a summary of the variables and how to measure them. The data used in this study covered the period from 1985 to 2011, as data for ALMPs are not available before that.

Table 10-3 List of Variables and sources

	Dimension	Variable	Sources
Dependent variable		Gini Coefficient for working age population	OECD (1985 to 2011)
Independent variable	Active social policy	Expenditure ALMPs	OECD (1985 to 2011)
	Conventional social policy	Old social expenditure	OECD (1985 to 2011)
		Expenditure on unemployment benefit	OECD (1985 to 2011
		Welfare generosity	Scrugg & Allan (1985 to 2011) Missing: Luxemburg
		Generosity of unemployment benefit	Scrugg & Allan (1985 to 2011) Missing: Luxemburg
	Economic	Real GDP per capita	OECD (1985 to 2011)

		Foreign direct investment	CWS(1985 to 2011)
		Unemployment rate	OECD (1985 to 2011)
	Age composition	Share of working age population (15-64)	OECD (1985 to 2011)
	Labour market institution	Union density	OECD (1985 to 2011)

Table 10-4 Number of inclusion by country

Country	Frequency of inclusion	Country	Frequency of inclusion
Australia	9	Netherlands	13
Austria	9	New Zealand	7
Belgium	12	Norway	5
Canada	26	Portugal	6
Denmark	21	Spain	10
Finland	24	Sweden	9
France	16	Switzerland	4
Germany	22	UK	13
Greece	3	USA	26
Ireland	12	Luxemburg	11
Italy	3		

Table 10-4 shows the number of inclusions in the analysis. Compared with the data analysed in Chapter 8, we can see an increase in the number of countries and the number of observations. New Zealand and Luxembourg were excluded from the analysis of private pensions but they included are in this analysis. Although the number of observations also increased, we still can see an imbalance among countries. As discussed in Chapter 8, this is one reason to employ multi-level analysis. The fixed-effect model and the random-effect model can be biased by an unbalanced data set, but multi-level analysis is not much affected. However, a Jackknife analysis was still carried out to check for any bias and the results are available in the Appendix C.2.

The methodology has already been fully explained in Chapter 6 so it does not have to be repeated here. This chapter also shows the result of the fixed-effect model, the random-effect model and the multi-level model.

10.4. Descriptive statistics

This section presents descriptive statistics of the main variables. Section 10.4.1 shows how the variables are changed over time. In particular, this section focuses on how spending on ALMPs and unemployment benefit has changed. Section 10.4.2 presents the mean value of each variable and compares the difference between institutional designs. The results of ANOVAs and t-tests are shown to check the significance of any difference.

10.4.1. Trend of key variables

Figure 10-1 shows the development of ALMPs, social investment expenditure, and conventional social expenditure. On average, government spending on ALMPs was 0.645% in 1985 and slightly increased to 0.796% in 2011, although some countries had decreased spending on ALMPs. English-speaking countries, such as New Zealand, the UK and the US showed decreases during this period and stayed at the low level of spending compared with other countries. Nordic countries showed relatively high volatility but generally spent more on ALMPs than other countries. Graph 4 shows the change in income inequality during this period. There are some differences by countries but it can be seen that income inequality among the working-age population generally increased. The Gini coefficient across countries was 0.275 in 1985 but increased to 0.306 in 2011. Scandinavian countries showed consistent increases but the level was still very low whereas English-speaking countries stayed at a high level of income inequality. Continental European countries maintained a medium level but Greece showed quite a high level of income inequality.

Figure 10-2 shows the trend of expenditure on unemployed benefit. There are variations between countries but the general trend can be seen to decrease slightly during this period. On average, spending on unemployment benefit took 1.56% in 1985 but decreased to 1.42%. Most of the Nordic countries showed the same trend on both ALMP and unemployment benefit, but Denmark showed a clear decrease in unemployment expenditure and an increase in ALMP. Netherlands is interesting as ALMP slightly decreased as did expenditure on unemployment. It should be noted that total social expenditure had increased during this period (20.24% in 1985 and 25.8% in 2009). In other words, other expenditure except unemployment spending increased in general.

However, unemployment rates also increased during this period in most countries, so we can argue that unemployment benefit actually decreased during this period.

The generosity scores of the unemployment rate show different results. As explained in the literature review, generosity score includes the replacement rate, duration and coverage of unemployment benefit. It is expected that the generosity of unemployment benefit will decrease as the proportion of ALMPs increases, but as Figure 10-3 shows, most countries showed quite a stable trend in this period. Sweden, Denmark, Canada and Germany showed a clear decrease in generosity whereas southern European countries such as Spain, Greece and Italy showed an increase in generosity score. In fact, southern European countries had relatively low levels of generosity so their levels were not very high despite increasing for a decade. Average value across countries increased slightly between 1985 and 2009. Standard deviation between countries reduced from 2.84 to 2.37 so the difference between countries was reduced. However, it should be kept in mind that the detailed trend was different by countries.

It should be noted that generosity of unemployment benefit did not necessarily decrease even though ALMPs had decreased. For example, Ireland showed a decrease in expenditure but generosity was slightly increased, and it was the same for Italy. It is true that expenditure on ALMPs increased but the quality of unemployment benefit was not degraded much, contrary to the findings of some previous studies. Regarding the dependent variable, Figure 10-4 shows that it increased from 0.275 to 0.306 between 1985 and 2011, so we can see that income inequality increased during this period. Regarding social investment, it is not easy to see a trend in how it developed as there are many missing values. Nevertheless, it showed 4.87% on average in 1997 but increased to 5.69% in 2009, so we can see that social investment increased between those years, but we need more data on this. Table 10-5 summarizes the changes in each value between 1985 and 2009.

Figure 10-1 Trend of ALMPs

<Sources: OECD social expenditure : http://www.oecd-ilibrary.org/>
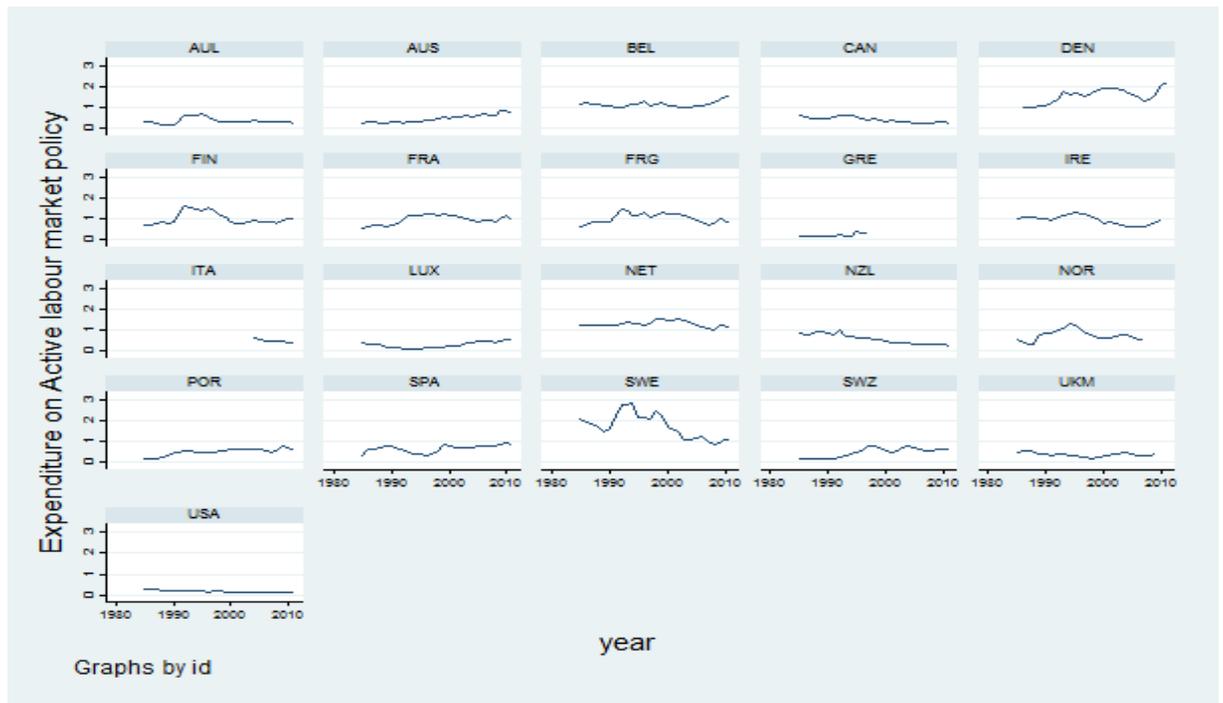
Figure 10-2 Trend of spending of unemployment benefit

<Sources: OECD social expenditure : http://www.oecd-ilibrary.org/>
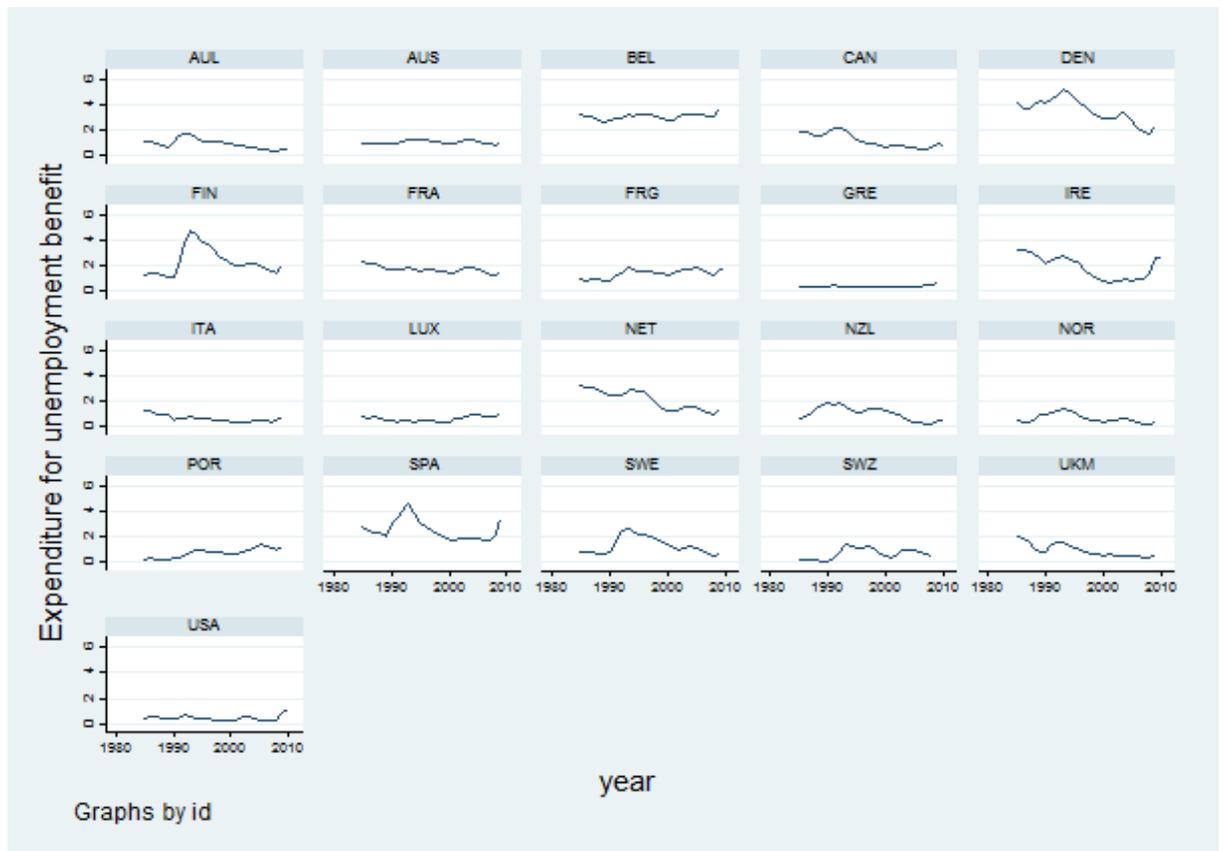
Figure 10-3 Generosity of unemployment benefit
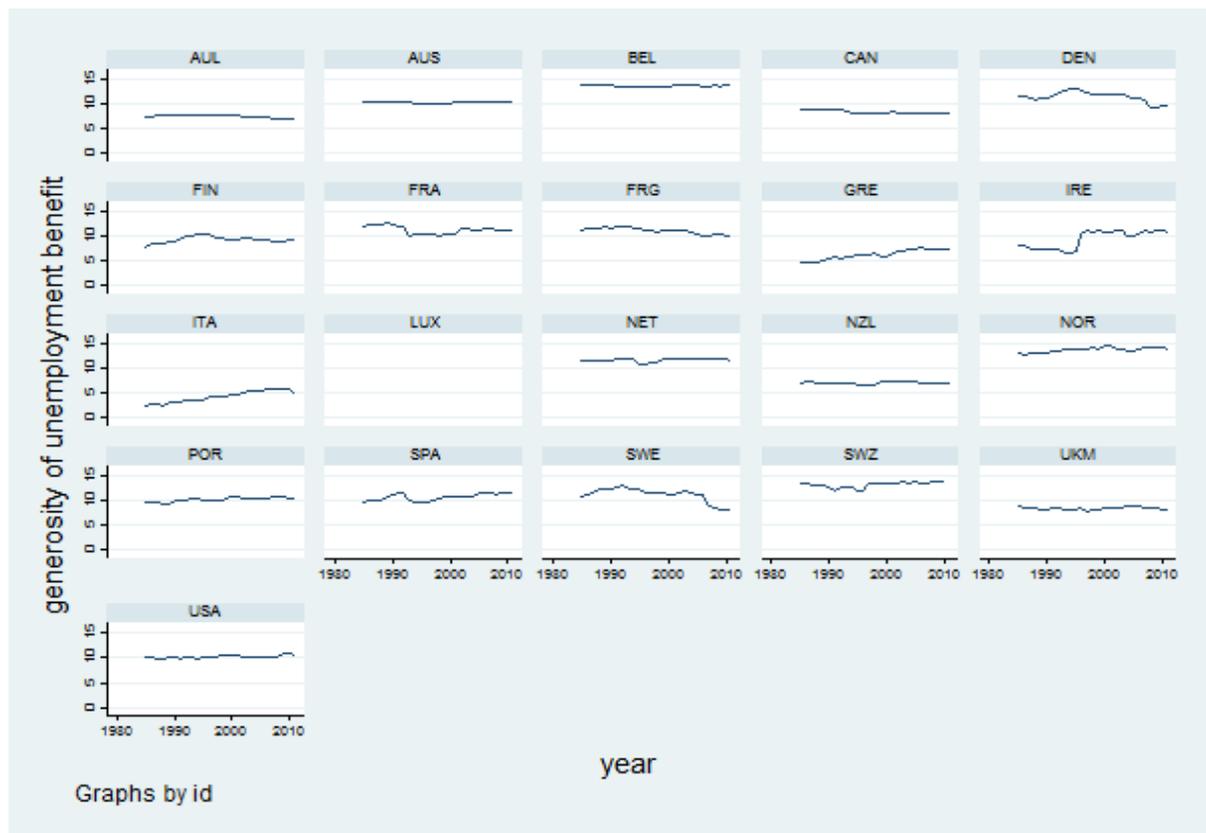
<Sources: Comparative welfare entitlement data set: http://cwed2.org/>

Figure 10-4 Trend of Gini coefficient among working age population

<Sources: Comparative welfare entitlement data set: http://cwed2.org/>
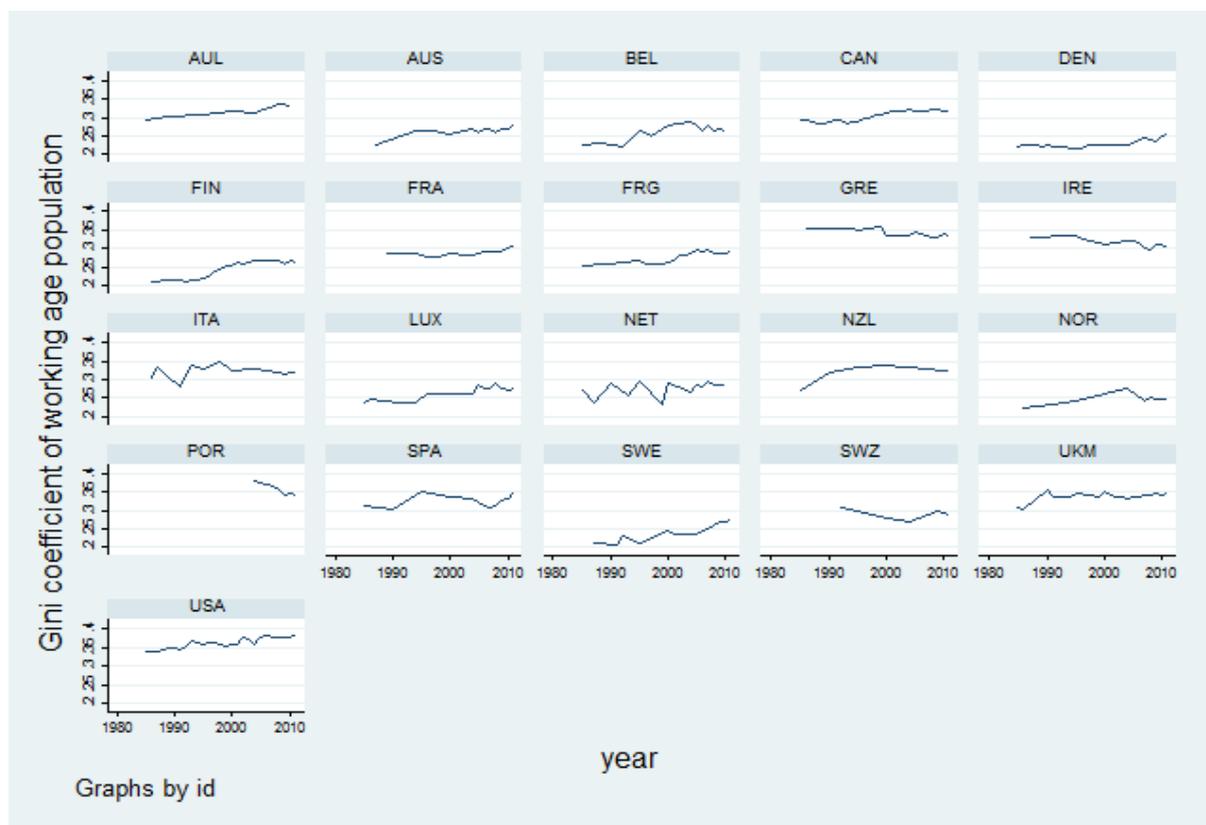
Table 10-5 Descriptive statistics of main variables

	Average value in 1985	Average value in 2009 (or 2011)	Difference between 1985 and 2009 (2011)
Active labour market policy	0.65%	0.80% (2011)	+0.15
Expenditure on unemployment benefit	1.56%	1.419%	-0.141
Other social expenditure (without ALMP and unemployment benefit)	17.9%	23.71%	+5.81
Generosity of unemployment benefit	9.6	10.01	+0.41
Gini coefficient	0.28	0.31 (2011)	+0.03

10.4.2. Difference between the institutional designs of unemployment benefit and MIPs

Table 10-6 shows the value of each variable by institutional design of unemployment benefit. As expected, The Citizenship model had lower income inequality and also spent more on ALMPs. This model shows the lowest income inequality and the highest level of welfare effort. The Basic Security-Targeted model and the Local MIP model showed relatively high income inequality and low welfare effort. In particular, the Local MIP model showed the highest level of income inequality and the lowest level of social expenditure, as well as generosity score. The Local MIP model shows less than half of spending on ALMPs and UI of the Basic Security-Targeted model. Table 10-6 shows that the Residual model, which has a high level of spending on ALMPs, had a low level of income inequality. However, this does not mean that spending on ALMPs leads to low income inequality as this model shows a generally high level of welfare effort.

ANOVA tests were carried out to check whether the difference between institutions was statistically significant and they showed that all these differences are statistically significant as the p-value was lower than 0.01 in all cases. We can see that there is a substantial difference between the key variables according to the institutional setting of unemployment benefit and MIPs. These results are available in the Appendix C.3.

Table 10-6 Statistics of the main variable by institution

	Gini coefficient	ALMPs (As % of GDP)	Expenditure on UI (As % of GDP)	Other social expenditure (As % of GDP)	Generosity of UI
Basic Security-Targeted	0.33	0.59	1.23	17.69	8.13
Citizenship	0.25	0.97	1.32	23.86	11.82
Hybrid	0.29	0.80	2.01	19.96	10.22
Residual	0.27	0.93	1.86	26.33	11.60
Local MIP	0.35	0.24	0.51	17.11	6.95

These statistics show that income inequality was higher in the Basic security-Targeted model and Local MIP model and lower in Citizenship model and Residual model. In fact, this is one of the hypotheses proposed earlier in this chapter so a T-test was carried out to check whether this difference is statistically significant. If this difference is statistically significant, then it sheds light on the idea that institutional design is significantly related to differences in income inequality. For the T-test, countries in Basic security-Targeted and Local MIP model were classified as one group (Group 1) and countries in Citizenship model and Residual were classified as another group (Group 2). As shown in the table, the Group 1 showed a higher level of income inequality than the Group 2 and the T-test showed whether this difference is statistically significant or not.

Table 10-7 Result of T-test

```
Two-sample t test with equal variances
───────────────────────────────────────────────────────────────────────────
   Group        Obs        Mean     Std. Err.    Std. Dev.   [95% Conf. Interval]

       1        102    .3364412     .0022566     .0227907    .3319647    .3409177
       2        149    .2628926       .00197     .024047     .2589996    .2667856
───────────────────────────────────────────────────────────────────────────
combined        251    .2927809     .0027239     .0431546    .2874162    .2981456
───────────────────────────────────────────────────────────────────────────
    diff               .0735486     .0030259                 .067589     .0795081
───────────────────────────────────────────────────────────────────────────
    diff = mean(1) - mean(2)                                   t =   24.3065
Ho: diff = 0                                 degrees of freedom =      249

    Ha: diff < 0               Ha: diff != 0                  Ha: diff > 0
 Pr(T < t) = 1.0000       Pr(|T| > |t|) = 0.0000         Pr(T > t) = 0.0000
```

Table 10-7 shows the results of the T-test. The t-test showed that the 95% confidence interval of Group 1 did not overlap that of Group 2, and that 95% of the confidence

interval of the difference between Groups 1 and 2 was between .675 and .079. This result shows that the Gini coefficient of Group 1 is likely to be higher than that of Group 2 at 95% probability. This result may provide supporting evidence that income inequality is significantly different according to the institutional design of unemployment benefit and MIPs. This also can be momentum to proceed further analysis.

Table 10-8 Correlation between key factors

	Share of working age population	Spending on ALMPs	Unemployment rate	Spending on UB	Spending on others	Union density	GDP per cap
Share of working age population	1.000						
Spending on ALMPs	-.2648***	1.000					
Unemployment rate	-.1470***	.1698***	1.000				
Spending on UB	-.1174***	.6092***	.5459***	1.000			
Spending on others	-.0688	.5440***	-.1045**	.2269***	1.000		
Union density	-.2767***	.5307***	-.0739*	.3630***	.3007***	1.000	
GDP per cap	.1714***	-.1302***	-.4908***	-.267***	.1733***	-.0529	1.000

Table 10-8 shows a correlation between the independent variables to avoid multi-collinearity. There is a substantial degree of correlation regarding spending on ALMPs. It can be seen that spending on ALMPs is correlated with spending on unemployment benefit, unemployment rate and other welfare programmes. In particular, the correlation coefficient is 0.6 between spending on ALMPs and spending on unemployment benefit. It is still helpful to carry out a regression analysis as this correlation is not a perfect linear correlation, so there is no perfect multicollinearity (Stock & Watson, 2012). So all the analyses were repeated without spending on unemployment benefit being included in order to check whether there were any substantial changes in the significance and direction of the other variables.

In brief, it seems to be true that the focus on welfare policy for addressing unemployment is moving from a protective policy to an active policy as the data show that unemployment expenditure decreased as total social expenditure increased, but the

differences were not very big. Spending on ALMP still forms only a small proportion but it has increased consistently. However, although the expenditure on unemployment benefit slightly decreased, the quality of social policy measured by generosity score did not change much. As explained above, Denmark showed a clear increase in ALMP and a decrease in unemployment benefit, and the UK and the Netherlands showed decreases in both, but the decrease in unemployment benefit was larger. Therefore, we cannot find concrete evidence of the retrenchment of the traditional welfare state, at least from the descriptive statistics. Spending decreased slightly, but generosity still looked stable over the last few decades.

One thing to be noted is that the standard deviation of unemployment spending and total social expenditure decreased between 1985 and 2009 whereas that of ALMP slightly increased. This implies that the trend in expenditure on the old social policy including unemployment spending showed convergence. The standard deviation of social investment also decreased so it can be assumed that social investment had increased and that the gap between countries reduced. This indicates that most developed countries are now taking a similar path in terms of their unemployment benefit systems and ALMPs.

In addition, the descriptive statistics show that there is a significant difference in income inequality and spending on ALMPs according to institutional design. Basic security-Targeted model and Local MIP model had relatively high levels of income inequality and low levels of ALMPs and unemployment benefit. Citizenship model and Residual model had low levels of income inequality and high levels of ALMPs as well as traditional social spending. The results of the T-test showed that countries in Basic security-Targeted model and Local MIP model had significantly higher levels of income inequality than countries in Citizenship model and Residual model.

10.5. Income inequality and the effect of ALMPs

This section presents the results of the main analysis of the relationship between ALMPs and income inequality. As stated in Chapter 1, the primary research question of this thesis is first to look to the empirical relationship between spending on ALMPs and income inequality, and second to look at the effect of the institutional design of unemployment benefit/MIPs, and third to look at how the interaction between the two affects income inequality. To find the answers, section 10.5.1 presented the effects of spending on

ALMPs without considering the institutional design of unemployment benefit/MIPs, and section 10.5.2 showed regressions in institutional design and with the interaction between ALMPs and the institutions of unemployment benefit/MIPs.

10.5.1. The effect of ALMPs: without context variables

The empirical analysis employed the following process. First, the fixed-effect model controlling the between-countries effect is examined. This model is expected to find the within-country effect of the independent variables by removing the between-countries variance. Then the results of the random-effect model assuming that country-level variance is uncorrelated with independent variables are compared with the result of the fixed-effect model. Finally, the results of the multi-level analysis are shown to see the within-country and between-countries effects. The results from each model are shown in Table 10-8.

Models 1 and 2 show the results of the fixed-effect, random-effect and multi-level models respectively. There are some differences between the random-effect model and the fixed-effect model. The effects of ALMPs are same in terms of significance and direction, but the effects of the unemployment rate and union density are different as they are significant in the random-effect model but not in the fixed-effect model. Again, the random-effect model is based on unrealistic assumptions so it may generate spurious results.

The results show that an increase in ALMP is significantly related to a decrease in income inequality. The effect of ALMPs is significant in both the random-effect model and the fixed-effect model. The random intercept model shows that it has a significant effect within a country, but not quite significant between countries. Many previous studies have argued that an active social policy does not show impressive results in terms of income distribution but this result implies that ALMPs do have a significant effect on decreasing income inequality. In any given country, we can observe that an increase in ALMPs is related to a decrease in income inequality.

The effect of other variables is not much different from expectation. The interesting thing is the effect of unemployment benefit and other social expenditure. Other things being equal, these models show no significant effect of spending on unemployment benefit within-country. The multi-level model shows that these variables are not significant

within-country, but very significant for reducing income inequality between countries. In other words, the results show that countries with a higher level of unemployment spending are likely to have a lower level of income inequality. However, as discussed in Chapter 6, the between-countries effect is likely to suffer from omitted variable bias so it is unlikely to be reliable. So it looks as if spending on unemployment benefit is not significantly related to changes in income inequality in this analysis. Of course, this does not necessarily mean that social spending on unemployment benefit does not have an effect on income inequality. In fact, it should be noted that the redistributive effect of ALMPs is stronger than unemployment benefit after controlling the unemployment rate. This is an unexpected result as previous studies have argued that unemployment benefit is more redistributive as it is directly related to the redistribution of income whereas ALMPs are a more indirect way than traditional social policy.

Controlling for all the other independent factors in this model, the coefficient of GDP shows that income inequality among the working-age population slightly but significantly increases as GDP per capita increases. Income inequality also increases when unemployment rate increases. The results also show that union density is not significantly related to income inequality. Strong union density does not show a significant effect on income inequality but it has a significant effect between countries.

Based on these results, it can be assumed that an increase in ALMPs is significantly related to a decrease in income inequality when other things are equal. Other models subjected to a sensitivity test showed a similar result for the main interest variable. They all showed that an increase of spending on ALMPs is related to a reduction in income inequality but there is only a small difference in the controlled variables. For instance, the GLS model and the linear regression model with Huber-White robust standard error showed that union density has a significant effect on income inequality. In other words, income inequality is reduced when union density is strong. Vliet and Wang (2015) pointed out that the global financial crisis in 2008 could affect the results, so this current study also attempts to implement a two-way fixed-effect model to control the time-fixed effect as well as an entity (country) fixed effect. The results still showed that an increase in ALMP is significantly related to a decrease in income inequality.

Table 10-9 Regression without institutional variable

Variable	Model 1		Model 2	
	Fixed effect model	Random effect model	Within-country effect	Between country effect
Share of working age population between 16-64	-.392625 (-1.97*)	-.3742559 (-3.86***)	-.4064203 (-4.35***)	-.3944985 (-1.43)
ALMP	-.0155058 (-2.59**)	-.0126919 (-2.71***)	-.016143 (-3.44***)	-.016948 (-1.26)
Unemployment benefit	-.0035503 (-.80)	-.0048443 (-1.99**)	-.0030928 (-.1.27)	-.0149957 (-2.37**)
Other social expenditure	-.000315 (-.35)	-.001159 (-2.17**)	-.0002067 (-.35)	-.0043038 (-4.74***)
Real GDP per capita	1.13e-06 (2.71**)	8.81e-07 (5.69***)	1.09e-06 (6.73***)	-.1.67e-06 (-3.18***)
Unemployment rate	.0017663 (1.75*)	.0023961 (4.24***)	.0016511 (2.96***)	.0025734 (1.76*)
Union density	-.0003707 (-.82)	-.0009476 (-5.50***)	-.0004035 (-1.59)	-.0005994 (-3.22***)
Constant	.5442766 (.3.88***)	.5747053 (8.54***)	.7239949 (3.92***)	
Observations	281	281	281	
Clusters	21	21	21	
R square	Within=.3883 Between=.4157 Overall=.5608	Within=.3697 Between=.6357 Overall=.6934	Log likelihood=808.51318	

Figure 10-5 Scatter plot
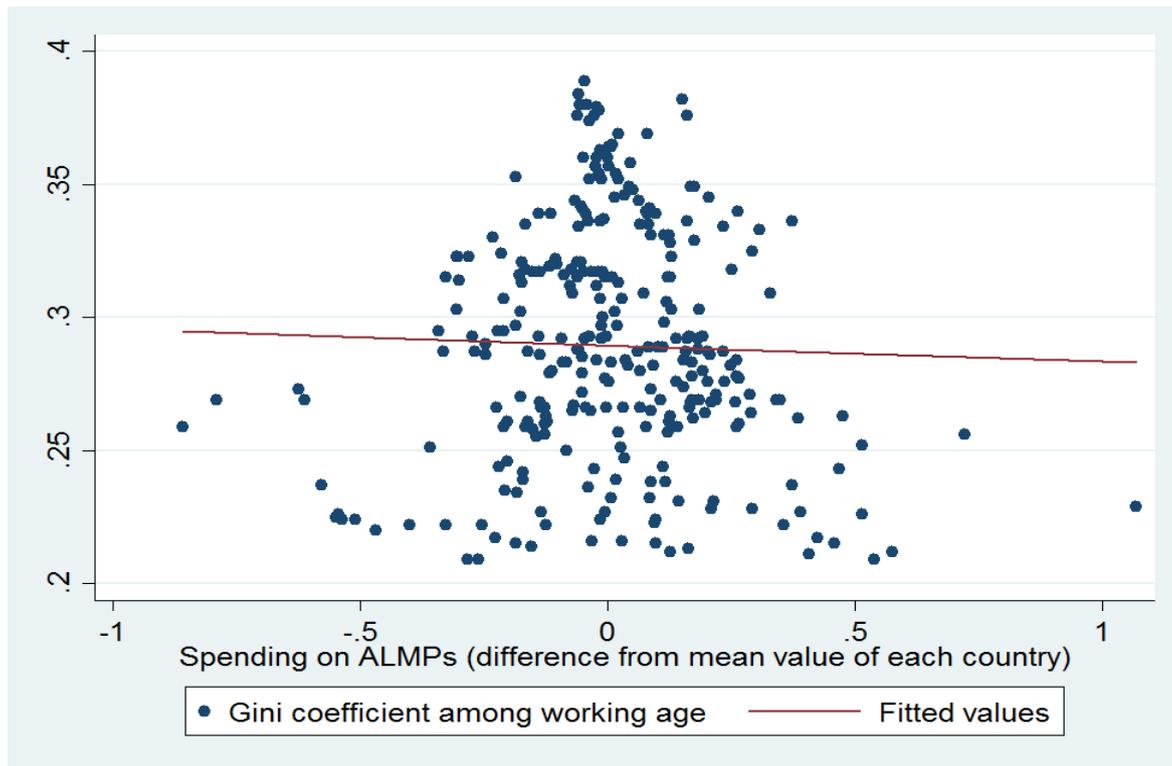
Figure 10-5 shows a scatter plot of ALMPs and income inequality. In this scatter plot, the X axis represents the spending on ALMPs, shown as the difference from the mean value of each country, and the Y axis represents the Gini coefficient among the working-age population. As explained above, the difference from the mean value is used to estimate the within-country effect. The scatterplot and the fitted line show that there is a negative effect between the two variables although the slope is very modest. According to this scatterplot, income inequality is negatively related to an increase in spending on ALMPS in a given country. This is in line with the results of the regression analysis which showed that an increase in spending on ALMPs is related to a decrease in income inequality in general. However, this general effect is the average value of the coefficient of each country so it does not provide detailed information on how the relation differs between countries. As shown in the case of a private pension, the within-country effect can differ from country to country for a variety of reasons. In this case, we can expect that this relationship will be different according to the institutional design of the unemployment benefit. Figure 10-6 shows a scatterplot and fitted line between two variables according to the institutional designs of unemployment benefit and MIPs.

Figure 10-6 Fitted line by institutional design

Graphs by typology
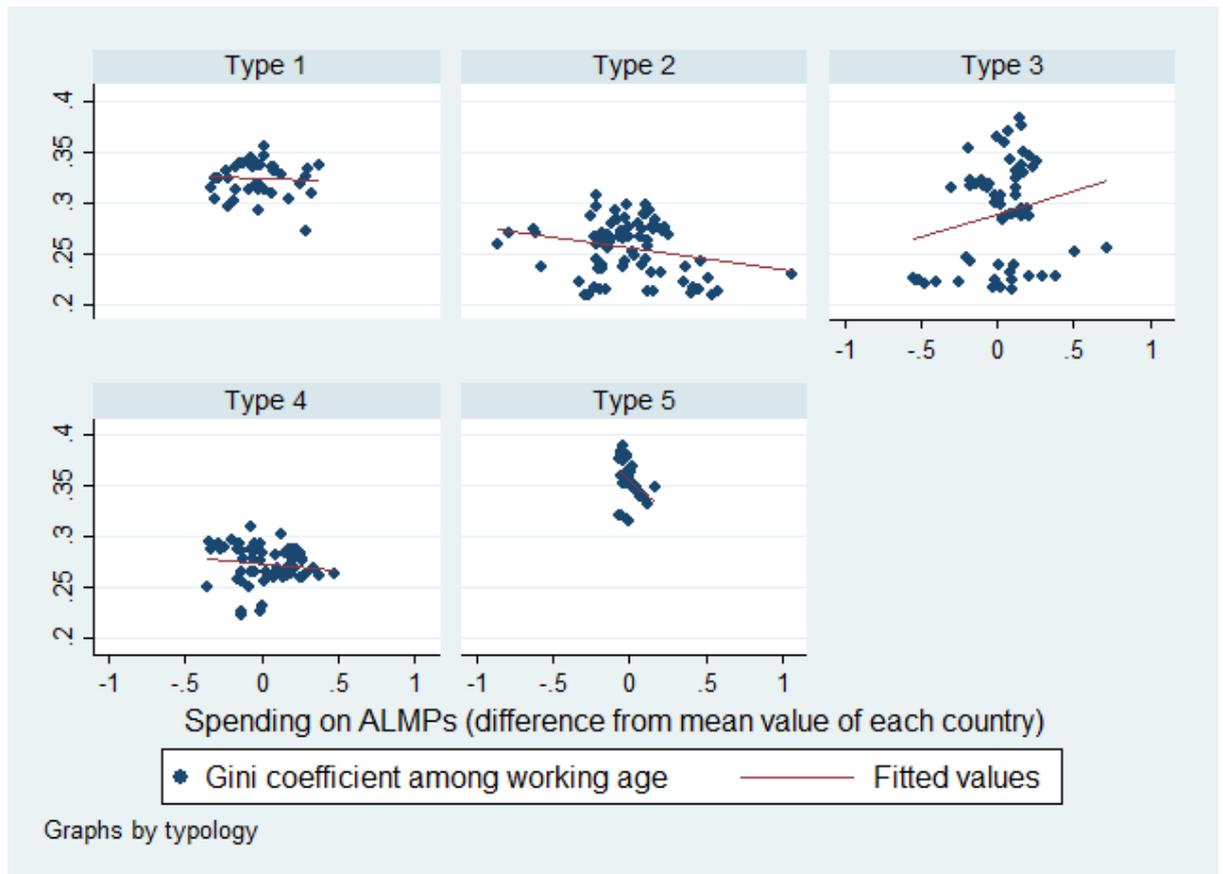
We can see that the slope showing spending on ALMPs is quite different according to the institutional design of unemployment benefit and MIPs. Generally, it looks to have a negative effect on the Gini coefficient as shown in Figure 10-5, but in fact the effect of ALMPs varies. An increase in ALMPs is related to a decrease in income inequality for some types but this relationship is the opposite in other types. This is an unbalanced panel so the length of the line is different by institutions, but there are some facts which should be noted.

An increase in spending on ALMPs is related to a decrease in income inequality in Citizenship model, Residual model and Local MIP model, but this relation is the opposite in Basic security-Targeted model and Hybrid model. In fact, the relation between the two variables is not very clear in Basic security-Targeted model and Local MIP model. Observations of countries in these models do not show a distinct direction so no clear relationship between the two variables is shown. In addition, observations in these models are clustered at a high level of income inequality whereas observations are clustered at a lower level of income inequality in Citizenship model and Residual model.

Observations in Hybrid model are spread across a range from low level to high level of income inequality.

This figure cannot be concrete evidence for a relationship between institutional design and income inequality, but it nevertheless shows why we need to consider the institutional design of a public pension as those differences between different institutions could be due to the difference in the institution and its interplay with ALMPs. These context variables on the institutional design of unemployment benefit and MIPs cannot be tested in the fixed-effect model as that model treats context variables as fixed effects. Table 10-10 shows the results of the random-effect and multi-level models using context variables and interaction variables.

10.5.2. The effect of spending on ALMPs in the context of institutional design of unemployment benefit

The results of Model 3 show the institutional design of an unemployment benefit which is classified based on universal and means-testing criteria. Countries are divided into five types and the Hybrid model is reference group in this analysis. ALMPs still show the significant effect of reducing income inequality and other social expenditure does not have a within-country effect, but it is quite significant in reducing income inequality in the between-countries effect. In contrast, unemployment rate shows a significant effect on increasing income inequality in a given country, but between countries the effect is not significant. The direction of each variable is in line with our expectation.

Income inequality is significantly affected by the institutional design of unemployment benefit and MIP. As shown in the descriptive statistics, the Citizenship model and the Residual model have significantly lower levels of income inequality than the other types, other things being equal. The other models have a relatively higher level of income inequality and the multi-level model shows that the Local MIP model has the highest level of income inequality. In other words, income inequality is significantly lower in the Citizenship model and the Residual model than in the other types, and Local MIP model has a significantly higher level of income inequality, other things being equal.

Without institutional variables, an increase in ALMPs is still significantly related to a decrease in income inequality. One thing different is that an increase in expenditure on unemployment benefit does not have a significant effect on income inequality in the

fixed-effect or multi-level models as discussed in section 10.5.1, but it is significantly related to an increase in income inequality at least between countries effect, when institution variables are considered.

Table 10-10 Regression with institutional variables

Variable	Model 3		
	Random effect model	Within-country effect	Between country effect
Share of working age population between 16-64	-.3882384 (-4.16***)	-.4030737 (-4.32***)	-.4293943 (-1.76**)
ALMP	-.0128471 (-2.86***)	-.0159959 (-4.23***)	-.0095169 (-.84)
Unemployment benefit	-.00406551 (-1.72*)	-.0029446 (-1.21)	-.0104078 (-1.82*)
Other social expenditure	-.0004089 (-.77)	-.0000966 (-.16)	-.0030981 (-2.90***)
Real GDP per capita	9.30e-07 (6.18***)	1.62e-07 (6.71***)	-1.30e-06 (-2.92***)
Unemployment rate	.0018272 (3.51***)	.001623 (2.91**)	.0009842 (.81)
Union density	-.0007392 (-4.20***)	-.0004109 (-1.62)	-.0007549 (-5.05***)
Basic security-Targeted	.0055585 (.43)	.0004453 (-.05)	
Citizenship model	-.0415333 (-3.38***)	-.0180982 (-2.06**)	
Residual model	-.037692 (-2.90***)	-.0170929 (-1.7571*)	
Local MIP	.015487 (1.10)	.0159137 (1.81*)	
Constant	.5772948 (8.74***)	.7245081 (4.31***)	
Observations	281	281	
Clusters	21	21	
R-square	Within=.3819 Between=.8457 Overall=.8240	Log likelihood=813.98874	

Table 10-11 presents the results of the regression analysis considering the interaction between the institutional design of unemployment benefit and ALMPs. This model carries some interesting findings. The results show that an increase in ALMPs is associated with a decrease in income inequality in the Citizenship, Residual, Hybrid and Local MIP models. In other words, the effect of ALMPs on income inequality is not significantly different among those four models. The interesting thing is the case of Basic security-Targeted model. In this model, an increase in spending on ALMPs is related to an increase in

income inequality, unlike the other models. This is a bit unexpected as we anticipated that the distributive effect of ALMPs would be larger in the Basic security-Targeted model as it is relatively less generous to the unemployed. As stated in section 2, this chapter is an exploration of how ALMPs interact with the institutional design of unemployment benefit/MIPs. Therefore, this chapter proposed slightly vague hypotheses which suggested that the effect of ALMPs is larger when there is a less generous unemployment benefit. It was therefore expected that the effect of ALMPs on decreasing income inequality would be larger in the Basic security-Targeted model and Local MIP model, but the result is the opposite of that expectation.

One thing to note is that an increase in unemployment benefit is not significantly related to a decrease in income inequality. The multi-level analysis showed that it is significantly related to a decrease in income inequality in between countries, but between countries the effect is likely to suffer from omitted variables bias so it is unlikely to be reliable. However, it is still worth noting the association at the country level as this is also useful for understanding the whole of 'what is going on' (Bell, Fairbrother & Jones, 2016). The between-countries effect shows that countries with a higher level of unemployment spending have significantly lower levels of income inequality.

Table 10-11 Regression with interaction variables

Variable	Model 4		
	Random effect model	Within-country effect	Between country effect
Share of working age population between 16-64	-.3299899 (-3.41***)	-.3324921 (-3.37***)	-.4289695 (-1.76*)
ALMP	-.0225846 (-2.72***)	-.0189042 (-2.22**)	-.0093991 (-.83)
Unemployment benefit	-.0038603 (-1.60)	-.0022561 (-.90)	-.0103755 (-1.82*)
Other social expenditure	-.0002935 (-.55)	-.0002092 (-.35)	-.0030672 (-2.88***)
Real GDP per capita	9.42e-07 (6.25***)	1.07e-06 (6.61***)	-1.27e-06 (-2.88***)
Unemployment rate	.0016778 (2.98***)	.0014205 (1.93**)	.0010739 (.89)
Union density	-.0008247 (-4.63***)	-.0006441 (-2.33**)	-.0007585 (-4.48***)
Basic security-Targeted	-.0168896 (-1.11)	.0004428 (.05)	
Citizenship	-.0517226 (-3.53***)	-.0174395 (-1.99**)	

Residual	-.0431183 (-2.54**)	-.0168542 (-1.69*)
Local MIP	.0099122 (.62)	.0162223 (1.85`)
ALMP*Basic	.0367783 (2.56***)	.0312648 (2.04**)
ALMP*Citizenship	.0125062 (1.35)	.0039287 (.41)
ALMP*Residual	.006295 (.51)	-.0003558 (-.03)
ALMP*Local MIP	-.0005848 (-.02)	.0006166 (.02)
Constant	.548172 (7.69***)	.7215469 (4.31***)
Observations	281	281
Clusters	21	21
R square	Within=.3943 Between=.8634 Overall=.8372	Log likelihood=816.40588

The conditional plot shows this relationship more clearly. As discussed in Chapter 7, the conditional plot presents the marginal effect of the independent variables on the dependent variable. In this case, it shows how much the Gini coefficient is changed when the spending of ALMPS increases by one unit of measure. The slope of the Local MIP type is steeper than those of the other three types, whereas the slope of the Basic Security type shows an increase in income inequality as ALMPs increase. The other three types show almost identical slopes.

Figure 10-7 Conditional plot
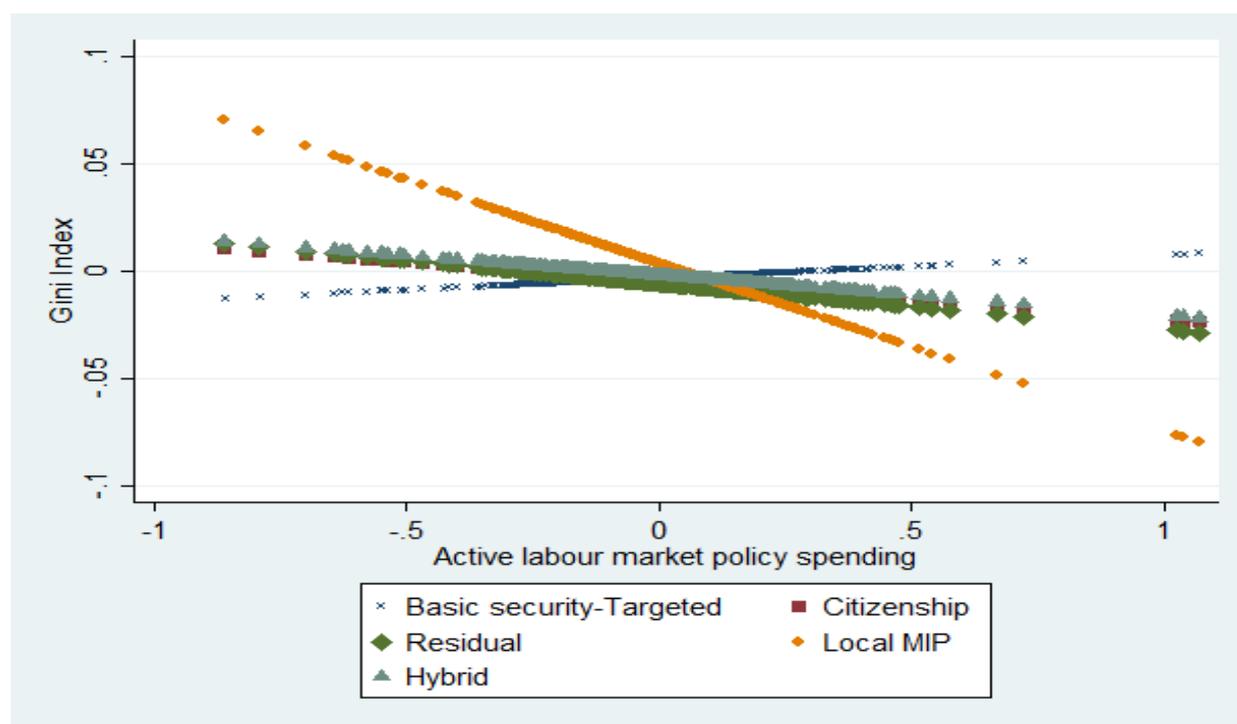
Some sensitivity tests were conducted for this analysis. As discussed in the previous section, this analysis employed social spending as a measurement of welfare effort to capture as many observations as possible so all of these models were repeated with the welfare generosity score. Two-way fixed-model analysis was employed to control the time-fixed effect, such as the financial crisis in 2008. Jackknife analysis was then applied to check for bias. The results of all these analyses are available in the Appendix C.2 .

The jackknife analysis made no difference because the multi-level model is not affected by unbalanced data, as discussed in the previous chapter. However, the results were slightly different when the generosity index was used (Appendix C.1). The directions of the coefficients remained the same, but the relationship between ALMPS and income inequality in the Basic security-Targeted model became insignificant.

10.6. Discussion and conclusion

The starting point of this chapter was to examine the distributive outcome of ALMPs, which are an emerging strategy for dealing with the new risks facing the welfare state. This study therefore set out to find the effect of ALMPs on income inequality and how it changes in different institutional contexts. Some empirical studies have previously addressed this topic and most of them have argued that an active social policy does not

have a significant effect on income distribution but it does have significant effect on increasing the employment rate. However, there have not been many studies which have relied on a rigorous quantitative method based on a large data set so this current study attempted to examine the distributive effect of ALMPs using a time-series data set. In fact, the cross-country variation in income distribution and active social policy was quite diverse so the effect of an active social policy can also be diverse. Some previous studies argued that the effect of an active social policy simply cannot be generalised as its distributive effect depends on the specific policy and socio-demographic structure of each country (Vaalavuo 2013; Vliet & Wang 2015). In addition, as we have seen in the previous chapter, current traditional social policies are expected to play an important role in moderating the distributive effect of ALMPs. Therefore, this analysis attempted to control socio-economic factors and the differences in the institutional designs of unemployment benefit and MIP.

This study classified the institutional design of unemployment benefit systems and MIPs based on the earnings-relatedness, qualifying period, duration and policy structure of MIPs. Five models were eventually identified and it was expected that the distributive effect of ALMPs would be different according to the institutional design of unemployment benefit and MIP. The findings were twofold.

First, the results showed that ALMPs have significant effect on decreasing income inequality. This implies that ALMPs can be a useful policy instrument to include the poor in the labour market so that they can get paid in order to reduce the gap between the rich and the poor. In this regard, it was expected that ALMPs would have positive consequences on income distribution in terms of inequality. One of the main criticisms of ALMPs is that they are only concerned with re-entry to the labour market for the unemployed so the quality of the job is often neglected. Thus, ALMPs sometimes force the poor to get a poorly paid job so they cannot get out of poverty even when they are working. However, the findings of this study have shown that ALMP has a significant effect on reducing the income gap between the rich and the poor, ALMPs can also be related to a significant redistributive outcome. As shown above, Cantillon (2011) argued that an active social policy does not work well on poverty reduction as an active social policy is less redistributive than conventional social policy, and conventional social policy becomes less generous.

The descriptive statistics showed that the generosity of unemployment benefit looked stable between 1985 and 2010 but that the trend was different by countries as some countries showed a clear decrease in the generosity of their unemployment benefit. From the perspective of finance, expenditure on unemployment benefit was slightly decreased and most countries maintained a similar level. However, the unemployment rates during this period increased, so spending on unemployment benefit divided by unemployment rate decreased in most countries. Overall, the descriptive statistics showed that the traditional unemployment benefit tended to decrease during this period.

The findings also raise the issue of the redistributive characteristics of an active social policy. Along with Cantillion, previous researchers employed social investment expenditure including ALMPs and other education expenditure to examine the distributive outcome of an active social policy and showed that an active social policy does not have a significant effect on income distribution. However, the active social policy and social investment that were used in those studies were a mixture of various concepts, so there might be an inevitable failure to find any significant effect of social investment or active social policy. So this current study separated ALMPs from other active social policies and found that ALMPs had a significant effect on reducing income inequality.

Another main finding of this study is the effect of ALMPs in the context of the institutional design of unemployment benefit. Some researchers have argued that the effect of ALMPs could decline when unemployment benefit is very generous. The findings of this current study have shown that the policy structure of unemployment benefits and MIPs can make a difference in income inequality, and the marginal effects of ALMPs can be different depending on the policy structure of unemployment benefit and MIP.

The most notable finding regarding interaction was that an increase in ALMPs is related to an increase in income inequality in the Basic Security-Targeted model. The other four models showed that an increase in ALMPs is significantly related to a decrease in income inequality. In other words, the distributive effect of ALMPs is different only in the Basic Security-Targeted model. The distinctive structural difference of the Basic Security-Targeted model is that it has a means-tested or flat-rate unemployment benefit, not an earnings-related unemployment benefit. Australia and New Zealand have means-tested unemployment benefits and they do not have social assistance such as MIPs, and the UK

and Ireland have a flat-rate unemployment benefit combined with various means-tested welfare schemes.

In this case, it can be inferred that a means-tested system makes a difference in the effect of ALMPs. As discussed in the literature review, there is a huge debate on the advantages and disadvantages of the means-tested system. One of the main disadvantages is that it removes the incentive for the poor to make an effort to get out of poverty. In this case, most countries impose some conditions for the unemployed to get a benefit from unemployment benefit, such as job searching or vocational training. These conditions are expected to act as incentives to make an effort to get a job. However, some unemployed people who receive the unemployment benefit are likely to stay in benefit rather than escape from unemployment if they do not expect to be paid as much as they want in a new job. In this case, their income level remains low although the government provides more opportunities for training and education. In contrast, the unemployed who expect to get a much higher income than the unemployment benefit can join ALMP programmes actively and get jobs that pay a higher wage. This can create a bigger gap between the bottom and the high-income classes.

Further research is clearly required into why the effect of ALMPs has a difference direction only in the Basic Security-targeted model. However, what we have found here is that the institutional design of unemployment benefit and MIPs not only has a significant effect on income inequality but also a significant effect on moderating the effect of ALMPs on income inequality. In particular, an increase in ALMPs was associated with a decrease in income inequality in most of the types that we classified, but this was associated with an increase in income inequality only in the Basic Security-targeted model that does not have an earnings-related unemployment benefit system. These findings offer some explanations based on the discussion of the disadvantages of the means-tested system but this has been just a preliminary exploration, so further research is required on this issue.

Another issue to keep in mind is that we do not have sufficient data to evaluate the outcome of ALMPs. As discussed in the previous section, there are many on-going discussions of the availability and usage of quantitative data in research into ALMPs. This current study has attempted to explore the effect of ALMPs by using data available so far, so these results are not final result for the distributive outcome of ALMPs. In addition,

ALMPs are expected to take effect with a time lag. However, this analysis did not explicitly consider a time lag because of data issues. Therefore, it is also very important to establish a data set with appropriate quality and further research considering the time lag of ALMPs is required. In addition, as discussed in section 10.3, there are still many issues regarding data on ALMPs. The data used in this study considered only national-level ALMP programmes, so data on local government and the private sector were not considered in this study. Previous researchers have pointed out that the role of local government and the private sector in delivering ALMPs is increasing (Finn, 2012; Sol & Westervel, 2005) so this should be considered as a topic for further study.

In conclusion, the findings of this study have shown that ALMPs have a significant effect on reducing income inequality and this effect can be different according to the policy structure of unemployment benefit and MIPs. ALMPs still have a significant effect on reducing income inequality when the unemployment benefit is relatively generous. This result also implies that there is no trade-off relationship between ALMPs and traditional unemployment benefit. This means that these results are in line with the positive effect of flexicurity, and show that a generous unemployment benefit combined with ALMPs can have a positive effect on income inequality, as well as on employment rates. There was only one type which showed that an increase in ALMPs has a negative effect on income distribution and the most distinctive aspect of that type is that it has a means-tested or a flat-rate unemployment benefit, rather than an earnings-related unemployment benefit at the national level. The disadvantage of the means-tested system can be one reason for a negative effect on income inequality, but further research is required to determine what factors cause this difference. In addition, the conventional welfare state presents a significant effect of reducing income inequality, and the policy structure of the unemployment benefit and MIP matters not only in income distribution but also in the effect of ALMPs.

Chapter 11. Discussion and Conclusion

The primary goal of this thesis was to examine the empirical relationship between new welfare policy instruments and income inequality. It has explored the distributive outcome of private pensions and ALMPs considering the institutional design of a protective welfare policy, such as public pension and unemployment benefit. It has shown that the effect of private pensions or ALMPs on income inequality can be different according to the institutional design of public pensions or unemployment benefits. At the same time, this study has also attempted to examine the effect of the institutional design of pension and unemployment benefit. This was based on the debate about the 'paradox of distribution' which argues that the universal system has a better shape of income distribution than the targeted system.

This final chapter brings together each part of this thesis and draws a conclusion and implication from the empirical findings from the analysis chapter. This chapter also offers a discussion of the limitations of this thesis in terms of methodology and policy implications and suggests topics for further research. Section 1 presents a brief summary of the thesis, including the background rationale for the research framework and the methodology. Section 2 reviews all the findings from the analysis chapters and synthesises the results. It also provides an empirical answer to the research question set out in Chapter 1. Section 3 discusses the policy implications which come from main findings, and how this thesis contributes to the existing literature theoretically and empirically. Section 4 reviews the limitations of the thesis in the chosen research framework, and suggests directions for further research.

11.1. Summary of the thesis

Income inequality had been considered as inevitable in a market economy for a long time. Some researchers have argued that income inequality could be a serious problem at the early stage of economic development, but it would be relieved as the economic structure develops (Kuznets, 1955). However, it has been reported that income inequality has increased over the last few decades in the developed world as well as the developing world (OECD, 2008; 2015). A high level of income inequality has a significant association with many social issues. Studies have shown that countries with high levels of inequality

are likely to have higher suicide rates and crime rates. In addition, poor households are likely to have poor health status when they live in countries with high income inequality. Some studies have shown that a high level of income inequality has a negative effect on individuals' subjective well-being and social solidarity, so countries with high income inequality have a lower level of social trust, which is a salient factor in social capital. These researchers have argued that a high level of income inequality is not desirable for either individuals or for society as a whole.

The welfare state restrains poverty and inequality by providing assistance and protection to vulnerable groups in the society. One of the main functions of a welfare state is to redistribute resources and spread social risk so that vulnerable groups can afford to maintain a decent quality of life. Despite the similarities in terms of the objective of the welfare state, details of the trajectory of welfare state development are quite different by countries so each country has a different institutional design of its welfare state. Empirical studies have shown that the difference in institutional design makes a significant difference in consequences in terms of poverty and inequality (Palme 2006; Scruggs & Allan 2006). In particular, there are long debates on the effects of the universal system and the targeted (or means-tested) system (Korpi & Palme, 1998). The targeted system is designed to provide protection to people who are in need of it, such as individuals at the lower end of the income class, whereas the universal system is aimed at providing benefit to all people in the society. The targeted system looks more effective in poverty and inequality reduction, but empirical studies have shown that the universal system lowers poverty and inequality.

On the other hand, the environment surrounding the welfare state has been changing quickly since the early 1980s. Changes in the economic structure, including the 2008 financial crisis, an increase in life expectancy and low fertility rates, changes in household formation and an increase in female labour market participation rate, all provide a rationale for re-thinking the traditional welfare state. An aging population produces an increase in public spending on pension programmes and is often considered as a threat to the fiscal structure of the welfare state. At the same time, developments in technology and changes in economic structure affect the labour market structure resulting in long-term unemployment due to the lack of advanced knowledge and skills. Low-skilled workers now face a growing risk of unemployment. These changes are closely related to

the emergence of new social risks which the traditional welfare state finds it difficult to cover. It requires reform or the introduction of new policy instruments in the welfare state.

Therefore, this thesis posed three questions regarding the effect of the welfare state on income inequality. The first is from the debate on the effect of the institutional design of the welfare state. As stated above, there is a debate regarding the effects of the universal system and the targeted system on income distribution, so this thesis attempted to analyse the effect of the institutional design of the welfare state on income inequality and to see which system is more closely related to a reduction in income inequality. There have been many empirical studies on this topic, but this thesis approached the issue with a different method using a time-series data set.

The second question is the effect of the new policy instruments which emerge in the process of reforming the welfare state. There are various types of new policy instrument but this thesis has focused on private pensions (excluding mandatory private pension, as they are not different from public pension practically) and ALMPs as population aging and the long-term unemployment of low-skilled workers are considered important changes in the welfare state. So, this study analysed the effect of private pensions on income inequality among the elderly and the effect of ALMPs on income inequality among the working-age population.

The third question is the interaction between the new policy instruments and the institutional design of the traditional welfare state. In other words, the third question is about the interaction between private pensions and the institutional design of the public pension system, and between ALMPs and unemployment benefit / minimum income programmes. Some studies have shown that the policy outcome of private pensions is dependent on the characteristics of the public pension system, but there are few studies of ALMPs and unemployment benefit. Thus, we assumed that the distributive outcome of the new policy instruments can be affected by the institutional design of the traditional welfare state.

Consequently. the first chapter of this thesis proposed three main research questions.

Q1. How does the institutional design of the welfare state affect income inequality? Which system is more useful for reducing income inequality between universalism and the targeted system?

Q2. How are new policy instruments related to changes in income inequality?

Q3. Do relations between the new policy instruments and income inequality differ by the institutional design of the traditional welfare state?

Regarding the chosen methodology, quantitative research on comparative social policy has a 'small-N' problem as a sample in the research is unlikely to be sufficiently large. Time-series data are frequently used to overcome the small-N issue. Time-series data means using repeated observations of each country over time, so it makes 100 observations if twenty countries are observed for five years. However, time-series data require a careful approach as assumptions of Ordinary Least Square regression are often violated. An important issue is how to control unobserved heterogeneity between countries. There are country-specific characteristics which vary by country but are not changed over time. The regression model can suffer from omitted variable bias if these country-specific characteristics are not controlled. The fixed-effect model is often used to control country-specific characteristics as it treats these characteristics as fixed effects, so these effects are taken out and we can see the pure relationship between the dependent variable and the independent variables. In other words, only the within-country effect can remain in the fixed-effect model. The cross-sectional effect, which focuses on between-countries differences, is likely to suffer from omitted variable bias so it is likely to be spurious.

In fact, the fixed-effect model could be used to answer Q.2 but it cannot be used for Q.1 or Q.3. Q.1 and Q.3 were designed to examine the effect of the welfare institution on income inequality, and the institution is not likely to change over time or it moves very slowly. The fixed-effect model cannot estimate an institution that does not change or changes slowly (Bartel, 2008; Bell& Jones, 2015). The fixed-effect model treats the institution as a fixed effect, so it cannot be estimated as the effect of the institution is already taken out. Other models, such as the random-effect model, can be used but it too is likely to produce a spurious result because of its unrealistic assumption that covariance between independent variables and unobserved error equals Zero ($Cov(X_{it}, U_i)=0$). In most

cases, independent variables are associated with unobserved error terms (Bartel, 2008; Bell & Jones, 2015; 2016)

Therefore, this study employed the random intercept model, which is a multi-level model. The advantagege of the random intercept model is that it separates the within-country effect and the between-countries effect. The random intercept model allows estimation of the effect of institutions, and we can still see the within-country effect at the same time. In addition, it is possible to test the effect of interaction between time-variant variables and the institution. This thesis overcame the limitations of the fixed-effect model and estimated the effect of the time-invariant institution by employing the multi-level model.

Q.1 has been tested by several previous researchers but this thesis used a slightly different methodology so it was not just a repetition of previous studies. As stated above, debates on the effect of institution design on income distribution are deeply related to the effect of the universal and targeted systems. However, institutions in each country have complicated structures so it is not easy to use a simple classification. Previous studies have employed various typologies, although the foundation of their classifications was concentrated on the universal system and the targeted system. Therefore, this study also attempted to employ a different classification based on the findings of previous studies.

Q.2 and Q.3 were designed to find more practical answers to fill gaps in the literature. As stated above, some studies have examined the distributive outcome of welfare reform or new policy instruments, but they were based on either county-specific cases or relatively small numbers of observations and there seems to have been no agreement on the distributive outcome of new policy instruments. In addition, although some studies have discussed the relation between the two in a theoretical perspective, most empirical studies have not considered the interaction between new policy instruments and the institutional design of the traditional welfare state. However, new policy instruments do not work in a vacuum, as there are already existing social programmes. Therefore, Q.2 and Q.3 look at the empirical relationship between income inequality and new policy instruments in the context of the institutional design of the welfare state by employing time-series data from about twenty OECD countries between the years 1980-2010.

Chapters 8, 9, and 10 presented an empirical investigation of how new policy instruments are related to income inequality. Chapters 8 and 9 particularly focused on how changes in private pension spending are related to income inequality among the elderly. Chapter 8 described the research settings, particularly focusing on the classification of institutional designs of a public pension system. First, this chapter followed the traditional classification of Beveridge-type and Bismarck-type systems. The Beveridge-type is based on a flat-rate, universal system whereas the Bismarck type is based on the earnings-related occupational system. Second, this chapter attempted to take a different approach based on eligibility and earnings-relatedness. Earnings-relatedness was computed by using the gap in replacement rate between the rich and the poor. Countries fell into high earnings-relatedness if this gap is low and into low earnings-relatedness if this gap is high. Low earnings-relatedness means that the public pension system is more close to a flat-rate system. Eligibility was computed by the coverage rate of each country. If a country has a higher coverage rate than the average across the countries, this country is considered to be closer to universal coverage. Consequently, this chapter produced three types of institutional design of public pension. Chapter 8 also provided descriptive statistics and an analysis. Chapter 9 provided a supplementary analysis to Chapter 8. The classification in Chapter 8 was based on eligibility and earnings-relatedness, but there are more things to be considered so Chapter 9 looked at the distributive effect of first- and second-tier pension programmes when private pensions increase, which provided supplementary evidence for the analysis in Chapter 8. Chapter 10 mainly focused on the effect of ALMPs on income inequality among the working-age population and proposed a classification of unemployment benefit and MIPs. These are more complicated than a pension system, and the classification was made based on the existence of earnings-related unemployment benefit and the characteristics of MIPs. This chapter produced five types, and the empirical analysis showed how changes in ALMPs are related to changes in income inequality and how this relation can be different by institutional design of unemployment benefit / MIPs. Due to limited data availability, Chapter 10 focused on the years 1985 to 2010.

11.2. Synthesis of the findings

It is not easy to produce practical policy implications from one empirical study, but this thesis has nevertheless produced a number of notable findings. This study has shown that

new policy instruments, private pensions and ALMPs are on the increase, but this is not necessarily related to a decrease of the traditional (or protective) welfare institute. In addition, those new policy instruments are clearly associated with changes in income inequality, but the directions are different from the theoretical expectation in some cases. The institutional design of the traditional welfare state is also significantly related to changes in income inequality. As expected, institutions based on the universal system show a lower level of income inequality, and the targeted system shows a relatively high level of income inequality. Moreover, the effect of new policy instruments is significantly affected by the institutional design of the traditional welfare state. An increase in private pensions or ALMPs is related to a decrease in income inequality when the public pension and the unemployment benefit are based on the universal system. In contrast, an increase in private pensions or ALMPs is related to an increase in income inequality if the public pension and unemployment benefit are based on the targeted system. Now it is necessary to return to the research questions to bring the results together and draw some practical lessons and conclusions.

Q.1 is about how the institutional design of the traditional welfare state is related to changes in income inequality. As shown In Chapters 8 and 10, this thesis attempted to classify the institutional design of public pensions and unemployment benefit/MIPs. Regarding the public pension system, it has been shown that the institutional design of a public pension system has a significant effect on income inequality. The strong earnings-relatedness/high coverage type showed a relatively lower level of income inequality than the other types. The institutional design of unemployment benefit/MIP showed a significant effect on income inequality. The Citizenship model and the Residual model countries had significantly lower levels of income inequality whereas the Local MIP model had a significantly higher level of income inequality. As stated in Chapter 9, the Citizenship model and the Residual model had earnings-related unemployment benefits and supplementary MIPs and Local MIP model did not have unemployment benefit or MIPs at the national level, so it is not altogether surprising. In fact, the distributive outcome of the Basic security-Targeted model is more interesting, as it has a flat-rate unemployment benefit and means-tested MIPs. it is more close to the targeted system compared to the Citizenship model and the Residual model, and it has a higher level of income inequality than those two models. Namely, the Citizenship model and the

Residual model showed the lowest level of income inequality and Local MIP model had the highest, whereas the other two models were in between them.

In brief, the effect of the institutional design of a welfare state is clear in the public pension system, and unemployment benefit. In addition, the direction of the effect is also in line with the so-called 'paradox of redistribution' which argues that the universal system is more useful than the targeted system in terms of distributive consequences. It has been argued in many previous studies and this study has confirmed the paradox of redistribution by testing it using multi-level analysis based on a large time-series data set.

Q.2 is about the direct distributive outcome of new policy measurements. Chapters 7 and 8 showed the effect of private pensions on income inequality and showed that an increase in private pensions is associated with a decrease in income inequality, unlike the expectation. In fact, this result is in line with the findings of a recent empirical study by Vliet and Wang (2015) who used data from about fifteen countries over fifteen years, and this current study has shown that the results remain the same when the data stretch out to twenty countries over thirty years. For the distributive outcome of ALMPs, an increase in ALMPs is associated with a decrease in income inequality. Some researchers have argued that social investment, including ALMPs, does not have a positive effect on income distribution (Cantillon 2011), but this study has shown that ALMPs alone have a positive effect on decreasing income inequality.

Q.3 is about how the distributive outcome of new policy measurement can be different from existing welfare programmes. There have been many studies which have examined the distributive outcome of the institutional design of the welfare state and that of new policy instruments, but they have not considered the empirical relationship between the two. In a broad sense, a generous welfare institution deteriorates the effect of new policy instruments on income inequality; it is either positive or negative. However, it is very difficult to define 'generous' so this study used a complicated classification.

Regarding the effect of private pensions, it has already been shown that an increase in private pensions is related to a decrease in income inequality, but it was expected that this relation could be changed by the institutional design of the welfare state. An increase in private pensions is still related to a decrease of income inequality in the strong earnings-related/high coverage rate type and the weak earnings-related type, but it is related to an increase in income inequality in the strong earnings-relatedness/low

coverage rate type only. In other words, income inequality increases when private pensions increase if the public pension system of a country is based on a strong earnings-related and low coverage rate system. Previous studies have argued that the strong earnings-relatedness of a public pension makes private pensions less attractive so the effect of private pensions on income distribution could be insignificant. However, this study has shown that the effect of private pensions is still significant when the public pension has strong earnings-relatedness. Moreover, a notable finding has been that an increase in private pensions is related to an increase in income inequality under a system that has strong earnings-relatedness but low coverage. As shown in Chapter 8, countries that have a weak earnings-related system are likely to have a high level of coverage rate. Consequently, it can be inferred that an increase in private pensions has a negative effect on income distribution if the coverage rate is low. The targeted system provides benefit to the poor only, so the middle class and the rich have a strong incentive to take out private insurance and this makes income gap bigger. In this sense, the poor and the middle class can be included in the public pension when the coverage rate is high and private pensions still have a positive effect on income distribution as long as the poor are included in the public pension. Therefore, this study proposes that it is important to cover the poor with the public pension.

This study carried out an additional analysis to examine the distributive effect of replacement rate at each level of public pension. Most of the developed countries have a two-tier pension system. A second-tier programme usually reflects the income security dimension so it is contribution-based and more selective, whereas a first-tier programme reflects the redistributive dimension. The difference in coverage matters in income inequality as shown in Chapter 7 and it has been shown that the important thing is whether the poor can be covered by the pension system or not. The poor are unlikely to have a private pension so the income gap would increase if the quality of the public pension is low. In this regard, it was expected that the benefit level of each tier programme might have a different effect on income inequality especially when they are combined with a private pension. Strengthening the first-tier pension programme can be a good strategy to achieve lower income inequality when the role of private pensions increases.

This study used coverage rate as one of the main tools of classification but in fact, most countries have a two-tier public pension system which is contribution-based (standard pension) or non-contributory (minimum pension). It has been shown that an increase in the replacement rate of both programmes has a significant effect on reducing income inequality but that an increase in replacement rate in the standard pension has a larger effect than in the minimum pension on the decrease of income inequality. However, this relationship is reversed when the interaction between replacement rate and private pension is considered. Namely, an increase in the replacement rate of the first-tier programme is related to a decrease in income inequality but an increase in the replacement rate of the second-tier programme is related to an increase in income inequality considering the interaction with an increase in private pension.

This implies that the rich could get benefit from a generous public pension and add more benefit from a private pension on the top of public pension when the replacement rate of the standard pension increases, as the income level during working life is to be maintained even after retirement. The expansion of private pensions under this circumstance leads to more benefit for the rich so income inequality increases as a result. However, an increase in the replacement rate in the minimum pension is related to a decrease in income inequality and this relationship gets stronger when the proportion of private pensions increases. This implies that an increase in the replacement rate of the minimum pension is still related to an increase in income inequality even when the proportion of private pensions increases. It can be inferred that increasing the generosity of the first-tier programme can be a good strategy for relieving income inequality when private pensions increase.

Regarding the interaction between ALMPs and unemployment benefit / MIPs, the effect of ALMPs is significantly different by the institutional design of the unemployment benefit and MIPs. It has been shown that an increase in ALMPs is associated with a decrease in income inequality in most types of country, but the relationship is reversed in the Basic-security-Targeted model. Under this institutional setting, an increase in ALMPs is related to an increase in income inequality. The notable difference between the Basic security-Targeted model and the other model is that it is based on a flat-rate unemployment benefit or mainly means-tested MIPs. Some previous studies have argued that the effect of ALMPs deteriorates when the unemployed are supported by generous unemployment

benefit or MIPs, but the results of this current study have shown that ALMPs have the positive effect of reducing income inequality generally and this is not significantly changed under the relatively generous institution of unemployment benefit.

In fact, Chapter 10 showed that the effect of ALMPs is negative on income distribution when the country has a means-tested system. In this case, further research is required on the reason why the Basic security-Targeted model has a different direction from the other models as this study only attempted exploratory research. However, some preliminary hypotheses have been proposed on this. Most countries impose some conditions to get benefit from unemployment benefit or MIPs, such as job searching or vocational training, which are expected to play a role as incentives to encourage the unemployed to make an effort to find a job. However, some of the unemployed cannot access the unemployment benefit or MIPs under a means-tested system. Consequently the unemployed do not have an incentive to join the ALMP programmes and this is particularly true of the unemployed at the margin. They have no incentive to join an ALMP programme actively so the effect of ALMPs to help the unemployed to get into labour market can be reduced compared with other types and this can mean that an increase in ALMPs is related to an increase in income inequality.

In brief, the interaction between new policy instruments and the institutional design of the welfare state showed interesting results, although that classification that was made in this study did not make a clear distinction between the different settings of welfare institutions. For the public pension system, an increase in private pensions is related to a decrease in income inequality except in the strong earnings-relatedness/low coverage type, and an increase in replacement rate is also related to a decrease in income inequality but its effect is larger in the minimum pension than in the standard pension. These results imply that including the poor in a public pension system can be important for decreasing income inequality. For ALMPs, an increase in ALMPs is related to a decrease in income inequality except in the Basic security-Targeted model. In a broad sense, the effect of ALMPs is negative in terms of income distribution when the unemployment benefit /MIPs system is more close to the targeted system.

It is not easy to draw practical and direct policy implications or lessons from these findings, as this study only explored the relationship between new policy instruments, welfare institutions and their distributive outcomes. Although there were many

limitations to this study, the research is worthwhile as it has provided broad policy guidelines on how to use and structure policy tools to reduce income inequality. Before considering the lessons and implication, it is necessary to consider the limitations of this research study.

11.3. Limitations of the research

Although this study attempted to classify and analyse available empirical data as much as possible, there were still some limitations. The limitations have been stated in each chapter, but it is still helpful to repeat them here as they directly affect what can be argued based on the findings. The limitations of the research can be divided into two parts. The first is related to limitations on data and methodology, and the second is related to the issue of the classification of the institutional design of the welfare state. The limitations of the data and the methodology were largely discussed in Chapter 7, so this section focuses on issues over the classification of the institutional design of the welfare state.

This study attempted to classify public pension systems and unemployment benefit systems based on selected criteria. However, most typology studies have faced similar issues. For pension programmes, most pension programmes have a very complicated structure so it is difficult to understand them properly. This study focused on coverage rate and earnings-relatedness but the replacement rate and the relationship between first- and second-tier pensions are also important. Replacement rate was tested separately but it still could not be seen from one specific angle. For ALMPs, the structures of unemployment benefit/MIPs are different by countries so heterogeneity between countries which are classified as the same type is still significant. For example, in Basic security-Targeted model, Australia and New Zealand have means-tested unemployment benefit but the UK and Ireland have flat-rate unemployment benefit combined with various means-tested welfare schemes. Although these countries are more close to a targeted system, the details are still different. Countries in Hybrid model also had substantial differences in regard to the duration of unemployment benefit. Countries in Hybrid model do not show any clear distinction and have different mixed types of mechanism.

Another issue about classification is that this study assumed that institutions had not changed during the study period. As stated in Chapter 8, pension programmes tend to change very slowly so it seems to be fine to assume that the classification would remain the same over the period, but small changes were still made and it was same for unemployment benefits and MIPs. In particular, the classification of unemployment benefit and MIPs employed data from 1996 to 2010, so it did not exactly correspond to the period of analysis which was from 1985 to 2010. It was the same for the pension system, as earnings-relatedness was computed by using data from 2001 to 2013 which was different from the period of the main analysis. This also applies to data availability, and this study attempted to work with the data which were available. Also, it should be remembered that time-series data could be useful in comparative research but researchers should be careful to estimate the effect of the institution, as an institution is likely to change if the time span of the study is long.

Despite its limitations, this study has still produced a number of interesting findings as shown in the previous section. Therefore, we can draw some meaningful lessons from the findings, although the limitations of the research should be kept in mind.

11.4. Lessons and implication

The findings of this study raise a number of implications for comparative research into income inequality and welfare reform. In fact, the lessons of the findings are mentioned in each chapter but it is still useful to repeat them here. The main lessons and implications can be divided into two parts. First, the implications of the methodology will be discussed and then the impact of the research on existing theories and on the literature on comparative welfare state research and income inequality will be presented.

11.4.1. Lessons from methodology and data

As mentioned in Chapter 6, comparative welfare state research which uses quantitative analysis often suffers from the small-N issue, and using time-series data is one way to overcome this problem. However, there are many issues to be considered when using time-series data, such as omitted variables bias or auto-correlation. Previous studies used simple OLS (Korpi & Palme 2006) or correcting auto-correlation but not omitted variables bias (Vliet & Wang, 2015). However, omitted variable bias might produce a spurious

result (Bartel, 2008; Shalve, 2007) and the fixed-effect model is frequently used as it can remove omitted variable bias by controlling country heterogeneity, but it cannot estimate time-invariant variables, such as institutions (Bartel, 2008; Bell & Jones, 2015). The researcher suggests using an analytical tool to control omitted variable bias and estimate the time-invariant variable at the same time by separating the within-country effect and the between-countries effect. The results of the random-effect and multi-level models when the institution variable is applied largely correspond to each other but there is still a notable difference. Therefore, it is suggested that it might not be a good way to put too much emphasis on results from the random-effect model or other models that do not control country heterogeneity, particularly when the effect of a time-invariant variable is considered. In fact, the multi-level model is suggested as an alternative to the fixed-effect model or the random-effect model (Bartel, 2008; Bell & Jones, 2015) as long as we can get a sufficient amount of data. The findings also confirm the usefulness of the multi-level model for using time-series data. However, it is still necessary to be careful when using multi-level analysis as it does not control auto-correlation, so future researchers should consider the feature of data that they want to use.

The findings also suggest the importance of the appropriate data set in comparative welfare research. Availability of data is a salient issue and has been frequently mentioned in previous studies. Due to the development of technology and statistical skill, we have much excellent quality data for comparative welfare research now, but it still does not seem to be sufficient for more rigorous research. In particular, data on income inequality need to be improved. The Gini coefficients among the elderly have many missing values in many countries. In addition, as described in Chapter 6, the Gini coefficient is good indicator for describing the general situation of inequality in a society, but it does not show details of the inequality. The main disadvantage of an aggregated index such as Gini coefficients is that it cannot show how income distribution changes (Deininger & Squire, 1996). Redistribution from the top to the middle class can be considered to be the same as redistribution from the middle to the bottom class. Income shares by quintile could be a better alternative but these data are available only partially so they do not seem to be appropriate for a time-series data set. Atkinson (1991) suggested that large amounts of data are required to avoid spurious results.

11.4.2. Implication for theory and knowledge

Apart from the lessons from the methodology and the data, the findings of this study also raise several important implications for studies on the relationship between welfare reform and income inequality. Further research is still necessary, as this study cannot propose precise policy advice or practical implications, but the findings nevertheless provide some meaningful guidelines and lessons on how welfare reform affects income inequality.

First, the results show that new policy instruments are positively related to income inequality, which means that an increase in new policy instruments is related to a decrease in income inequality. For private pensions, some previous studies predicted that income inequality would be increased if the proportion of private spending increases. They argued that the better off are likely to be able to afford to buy private pensions and this exacerbates income inequality. In addition, other studies have argued that private pensions do not have a significant effect on income distribution if the public pension is generous enough for the rich. However, some studies have shown that an increase in private pensions is not necessarily related to an increase in income inequality. These arguments and the results of previous studies are still controversial and inconsistent, but the result of this current study support the argument that the effect of private pensions is not necessarily negative on income distribution. It is same for ALMPs. As shown in Chapter 10, not many empirical studies have looked at the distributive outcome of ALMPs and some studies have attempted to examine the distributive outcome of social investment, which includes ALMPs. Most of these studies have shown that social investment does not have a significant effect on income distribution, and others have argued that social investment will not produce better income distribution. Social investment covers various areas so its impact might be unclear as some of them take a long time to take effect. Therefore, this study separated ALMPs from other forms of social investment and looked at the relation between ALMPs and income inequality, and showed that an increase in ALMPs is related to a decrease in income inequality. In other words, it can be inferred that social investment might not reduce poverty and inequality, but this is not because of ALMPs. ALMPs in themselves can be regarded as having a positive effect on income distribution.

However, a more important finding of this study is that the effect of new policy instruments can be different by welfare institution, which affects new policy instruments. In particular, it has been shown that there is no trade-off relationship between new policy instruments and traditional welfare programmes in terms of distributive outcome. For private pensions, the effect of private pensions is much affected by the institutional design of the public pension programme. What matters is that an increase in private pensions is related to a decrease in income inequality when the public pension has a high coverage rate. As stated in Chapter 8, there is a debate on how earnings-relatedness affects private pensions and these results show that strong earnings-relatedness is not necessarily related to the insignificance of private pensions. This shows that coverage is a more important factor affecting the impact of private pensions. High coverage is related to a positive effect on private pensions on income inequality. Therefore, if the government wants to increase the proportion of private pensions because of budget pressure, then it has to make an effort to extend its coverage and include the low-income class in the public system. Additional analysis of the distributive effect of the minimum pension replacement rate also shows that the expansion of a minimum pension which is based on a non-contributory system is important to avoid increasing income inequality. An increase in the replacement rate of the minimum pension is associated with a decrease in income inequality, whereas an increase in the replacement rate of a standard pension is associated with an increase in income inequality when the private pension is on the increase. In other words, a standard pension that is likely to have strong earnings-relatedness and limited eligibility is not related to a decrease in income inequality even when the generosity of the standard pension increases.

Therefore, the most important implication of this study for pension programmes is that the design of a public pension system to include more people, particularly the lower income class, is very important to avoid serious income inequality when the proportion of private pensions increases. The role of the minimum pension system is more important in this sense.

Regarding the effect of ALMPs, the effect of ALMPs on income inequality is also much affected by the institutional design of the unemployment benefit system and MIPs. As stated above, generally an increase in ALMPs is related to a decrease in income inequality, but the effect is reversed when it is combined with a flat-rate or targeted unemployment

benefit. Under the Basic security-Targeted model, an increase in ALMPs is related to an increase in income inequality. Unlike pension systems, not many studies have looked at the details of the theoretical discussion on how ALMPs are related to unemployment benefit or MIPs. As frequently mentioned throughout this thesis, many studies have disagreed over the disadvantages of a targeted system compared with a universal system. This study also provides an explanation for this based on the disadvantages of the targeted system. As mentioned in Chapter 10, some unemployed who receive the unemployment benefit are likely to stay in benefit rather than escape unemployment if they do not expect to get paid as much as they want in the new job. In this case, their income level remains low even though the government provides more opportunities for training and education. Therefore, an increase in ALMPs is not related to decreasing income inequality in a means-tested system. In addition, some previous studies have shown that a generous unemployment benefit can reduce the effect of ALMPs on employment rates and other studies have argued that flexicurity indicates that ALMPs and generous unemployment benefit make a synergy impact. The results of this study suggest that the flexicurity model can have desirable results in terms of income distribution, as well as employment rate.

It is worth noting that the effect of ALMPs is related to an increase in income inequality only in the Basic security-Targeted model and further studies are required to look at this relation in more detail and offer more elaborate explanations.

In a broad sense, this study has shown that new policy instruments do not work in a vacuum. Private pensions and ALMPs do not act at a distance from existing institutions; they are closely associated with each other. Therefore, the interplay between the two should be carefully considered when new policy instruments are introduced. The findings of this study have also shown the advantages of universalism over the targeted system. However, the institutional design of a welfare system does not clearly show any significant effect on income inequality, but the effect of new policy instruments shows a positive effect on income inequality under the universal system.

New policy instruments have various goals apart from income distribution. Reduction of the government's fiscal burden or establishing a more sustainable and productive welfare system are also regarded as two of the main reasons to introduce new policy instruments. In addition, changes in the view of the welfare state are a reason for welfare reform. A

protective welfare state played an important role after the Second World War, but recent changes in economic structures and developments in technology have raised a question about whether the traditional welfare state might not be appropriate for improving the welfare of citizens in a society. Namely, a protective welfare state might not contribute to providing proper protection, widening economic opportunities or reducing social risks in the long term under the current socio-economic changes in the modern world. Luckily, this study has shown that new policy instruments also have a positive effect on income inequality if they are combined with an appropriate traditional welfare institution.

The findings of this study also put an emphasis on the role of the traditional welfare state in income distribution. The welfare generosity of the public pension system is significantly related to a decrease in income inequality. This means that a decrease in the generosity of the public pension system is related to an increase in income inequality. For pension generosity and income inequality among the elderly, the relationship is quite clear that an increase in pension generosity is related to a decrease in income inequality. For unemployment benefit and income inequality among the working-age population, the relationship is not significant but the institutional design of unemployment benefit and MIP is still significantly related to changes in income inequality. In particular, Local MIP model showed the highest level of income inequality and countries in this type do not have any unemployment benefit or MIPs at the national level. Therefore, the traditional welfare institution still matters in income inequality.

Consequently, it can be argued that it is important to maintain the quality of the traditional welfare state, although new policy instruments do have a positive impact on income distribution. It is not a useful strategy therefore to decrease the traditional welfare state which increases spending on new policy instruments in terms of income inequality. In this case, reforming the traditional welfare state to make a better combination with new policy instruments is required to stop the increase of income inequality, rather than a retrenchment of the traditional welfare state. As discussed above, it is not relevant to draw practical policy advice from one empirical study, but this can nevertheless be a general guideline for future research and policy practice.

11.5. Conclusion and suggestions for further study

At the start of this thesis, the question was asked why income inequality has increased over the last few decades and how can we stop the increase of income inequality. There are various reasons for the increase of income inequality, and welfare policy is one of salient tools for the government to reduce income inequality by the redistribution of income. Welfare policy has been designed and implemented in various ways by different countries, as each country has its own socio-economic structure and political interest groups surrounding each welfare institution. Each country has its own process of development in its welfare state so now we can see various types of welfare state across the world. The traditional welfare state had played an important role in increasing income inequality.

However, the traditional welfare state now faces new socio-economic issues which require a new system to protect the poor and reduce new social risks that are brought in by changes in socio-economic structure throughout the world. There have not been many studies which have examined the distributive outcome of new policy instruments, so this study looked at the relationship between new policy instruments and income inequality. There are various types of new policy instruments, but this study has concentrated on private old-age pensions and ALMPs.

These new policy instruments do not work separately. The traditional welfare state institution already exists and previous studies have shown that it is closely related to the effect of new policy instruments. Therefore, this study looked at the effect of new policy instruments on income inequality and how they interplay with the existing institutional design of the traditional welfare state. Before looking at this interplay, this study also examined the effect of the new policy instruments and the effect of the institutional design of the traditional welfare state respectively.

The main empirical contribution of this study is to show that the distributive outcome of new policy instruments can be different by the institutional design of the welfare state which surrounds new policy instruments. Generally, an increase in private pensions is related to a decrease in income inequality, but the relationship is reversed when the public pension system has strong earning-relatedness and a low coverage rate. For ALMPs, the general increase in ALMPs is related to a decrease in income inequality but it has the opposite direction when the unemployment benefit system is based on a targeted or flat-

rate system. Both cases show that the distributive outcome of new policy instruments is closely related to the institutional design of the traditional welfare state.

These results raise several important implications. They show that the institutional design of the traditional welfare state plays an important role in determining the effect of new policy instruments on income inequality. In particular, new policy instruments are related to an increasing in income inequality under a welfare institution based on a targeted system whereas it is related to a decrease in income inequality under other welfare institutions. This shows the disadvantage of the targeted system in terms of income inequality when it is combined with new policy instruments. Although new policy instruments are actively being introduced, the traditional welfare state still matters in income distribution. The government needs to reform the traditional welfare state but the retrenchment of a welfare state does not have to be treated as a synonym for reform. Changing the traditional welfare state seems to be necessary to amplify the synergy with new policy instruments. The reduction in income inequality, of course, is not the only goal of welfare reform, but the findings of this study suggest that the reform of the welfare state, rather than its retrenchment, is required to have the better shape of income distribution.

Despite the relevant findings of this study, there are still many issues to be researched on the relationship between income inequality and the welfare state.

This study has focused on the distributive effect of private pensions and ALMPs but there are diverse dimensions which lead to the current reform of the welfare state. One of the salient changes in the current world is changes in family structure. As stated in Chapter 5, the traditional welfare state institution is based on the male breadwinner model so changes in the family structure in terms of gender roles require substantial changes in the welfare state. Previous studies have argued that those changes are closely related to changes in income inequality (Korpi, 2000; Esping-Andersen, 2009). Instability of marital status, an increase in assortative marriage and the female labour participation rate are also important factors which lead to changes in income distribution. The conventional idea of gender roles in the household is the male breadwinner model and the job of females is to take care of children and household chores. However, as the economy grows and the education level of women increases, the dual-earner model is more prevalent now in most developed countries, especially western and northern European countries.

The increase in the education level of women leads to higher incomes for women and makes women's bargaining power greater within the household. Women have become more independent than in their grandmothers' generation and various types of marriage are socially accepted today. This is related to the increase in the number of female household heads and this is salient in the change of income inequality since the gender gap in earnings is still significant in most countries although the gap is now decreasing (Esping-Andersen, 2009). Martin (2006) showed that 41% of the change in income inequality are related to changes in family structure during the 1976-2004 period. Lerman (1996) examined the relation between changing US family structure and income inequality and also found an increase in the number of households with an unmarried mother, which suggests that high income inequality is closely related to the increase in income inequality in the US.

However, Esping-Andersen (2007) insisted the impact of the changes in family structure on income inequality is significant only in America, not in European countries which are well equipped with a suitable social welfare system because social protection acts as a cushion for the female breadwinner and the children in their household in European countries. He found that the incidence of the lone mother is not associated with dynamic income inequality in European countries. In contrast, Kollmeyer (2012) found that the number of children with a single mother is related to an increase in income inequality, which means that the incidence of the lone mother is related to an increase in income inequality in Europe as well as in America. In a later study, Esping-Andersen (2009) argued that the effect of family structure could be different among European countries according to the welfare institution which the country has. Namely, he argued that changes in household structure and in the sociological characteristics affect income distribution, but that the size and pattern of change vary according to the welfare institution

So changes in family structure and gender roles are considered to be an important dimension in income distribution, as well as for the welfare state institution. An increasing number of studies have recognised the importance of those changes on income inequality, but there is not sufficient empirical research on this topic. It is necessary to look at not only the aging population and changes in the labour market structure, but also changes in family and household structure in order to deal with the increase in income inequality and the effect of the welfare state. Changes in family

structure or individual behaviour on marriage are observed and measured at the individual or household level, whereas policy instruments are observed and measured at the national level. The multi-level model which combines micro-level variables with macro-level variables allows us to test the impact of new policy instruments on income distribution controlling micro-level changes. Further research on this topic is required to see the big picture of how the welfare state and income inequality interplay with each other.

Appendix

Appendix A. Statistical appendix to chapter 8: additional regression models

1. Regression without capital openness: Bismarck Model and Beveridge model

Variable	Model 1 Fixed effect model	Model 2 Random effect model	Model 3 Random effect model	Model 4 Within-effect	Model 4 Between effect	Model 4 Within-effect	Model 4 Between effect
Share of elderly population over 65 years old	-.1896081 (-.76)	-.1623039 (-1.36)	-.1601393 (-1.34)	-.1793572 (-1.38)	-.3391442 (-.66)	-.1887185 (-1.44)	-.3310343 (-.64)
Labour Market participation rate of elderly	.0037949 (2.52**)	.0035851 (4.80***)	.0035881 (4.79***)	.0034656 (4.27***)	-.0037957 (3.05***)	-.0034431 (4.24***)	.0038946 (3.08***)
Real GDP per capita	-3.09e-07 (.58)	-2.35e-07 (-0.76)	-2.31e-07 (-.74)	-2.82e-07 (-.89)	-1.42e-06 (-.93)	-2.88e-07 (-.91)	-1.45e-06 (-.96)
Relative size private pension	-.0246553 (-1.46)	-.0284182 (-2.78***)	-.0285461 (-2.78***)	-.0239502 (-2.03**)	-.89126 (-2.24**)	-.0231836 (-1.94*)	-.0894948 (-2.26**)
Welfare generosity	-.0068378 (-5.54***)	-.0065435 (-9.96***)	-.0065659 (-9.71***)	-.0067262 (-9.13***)	-.0060649 (-4.78***)	-.0065378 (-7.63***)	-.0061012 (-4.82***)
Bismarck model		.0278859 (1.68*)	-.0290246 (1.65*)	.0005589 (.02)		.0001361 (.01)	
Private pension *Bismarck			-.0171156 (-.19)			.0526535 (.43)	
Constant	.5130362 (8.59***)	.4941229 (18.26***)	.494363 (18.18***)	.5637661 (7.53***)		.5640432 (7.56***)	
Observations	175	175	175	175		175	
Clusters	19	19	19	19		19	
R square	within = 0.4824 between= 0.5213 overall = 0.4646	within = 0.4816 between = 0.5867 overall = 0.5639	within = 0.4812 between = 0.5934 overall = 0.5673	Log likelihood= 487.517		Log likelihood= 487.61011	

2. Regression without capital openness: Earning-relatedness and universal eligibility models

Variable	Model 1	Model 2	Model 3			
	Random effect[4] model	Random effect model	Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.1304313 (-1.13)	-.0760638 (-.64)	-.1825578 (-1.41)	-.5889093 (-1.29)	-.1287166 (-1.00)	-.6738288 (-1.50)
Labour Market participation rate of elderly	.0035205 (4.72***)	.0031226 (4.04***)	.0032773 (4.10***)	.0037382 (3.01**)	.0028403 (3.56***)	.0033898 (2.77***)
Real GDP per capita	-2.18e-07 (-.70)	-.2.96e-07 (-.94)	-2.50e-07 (-.79)	-1.58e-06 (-1.17)	-3.68e-07 (-1.16)	-1.77e-06 (-1.33)
Relative size private pension	-.0316302 (-3.19***)	.0273228 (.93)	-.024185 (-2.05**)	-.0691812 (-2.17**)	.061358 (1.86*)	-.0679618 (-2.16**)
Welfare generosity	-.0062558 (-9.44***)	-.0063332 (-9.59***)	-.0067415 (-9.13***)	-.0047899 (-3.19***)	-.0070125 (-9.62***)	-.0044606 (-3.01***)
Type 1	-.0286189 (-1.69*)	-.0173368 (-.97)	-.0263415 (-1.76*)		-.0260309 (-1.77*)	
Type 2	-.0139594 (-.67)	-.003333 (-.15)	-.0242651 (-1.22)		-.0260309 (-1.34)	
*Private pension *Type 1*		-.0644926 (-2.09**)			-.0914742 (-2.74***)	
*Private pension *Type 2*		-.0701114 (-1.71*)			-.1032783 (-2.27**)	
Constant	.5128841 (17.88***)	.503391 (17.40***)	.5765763 (8.31***)		.585774 (8.57***)	
Observations	175	175	175		175	
Clusters	19	19	19		19	
R square	within = 0.4794 between = 0.6418 overall = 0.6062	within = 0.5001 between = 0.6434 overall = 0.6062	Log likelihood= 488.94098		Log likelihood = 492.87433	

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[4] Fixed effect model does not estimate institution variables, so the result would be same with previous table.

3. Regression with social spending instead of generosity score: Bismarck Model and Beveridge model

Variable	Model 1	Model 2	Model 3	Model 4			
	Fixed effect model	Random effect model	Random effect model	Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.1398363 (-.33)	-.0857246 (-.52)	-.1078991 (-.66)	-.1425028 (-.87)	-.6555811 (-1.26)	-.2175091 (-1.40)	-1.322678 (-2.11**)
Labour Market participation rate of elderly	.0056353 (2.93***)	.0047965 (5.04***)	.0047472 (4.84***)	.0033763 (3.43***)	.0057114 (3.53***)	.0029982 (3.02***)	.0061631 (4.03***)
Real GDP per capita	-8.79e-08 (-.11)	-2.24e-07 (-.53)	-2.05e-07 (-.48)	1.24e-07 (.30)	-2.85e-06 (-2.08**)	5.91e-08 (.15)	-4.66e-06 (-2.84***)
Capital openness	-.0002239 (-.02)	-.0006876 (-.17)	-.0013133 (-.33)	-.0027621 (-.73)	.0374388 (2.79***)	-.0039978 (-1.10)	.052131 (3.27***)
Relative size private pension	-.0233502 (-.97)	-.0223585 (-1.68*)	-.022988 (-1.75*)	-.0192041 (-1.33)	-.032989 (-.65)	-.0148497 (-1.09)	-.0885589 (-1.46)
Pension expenditure	-.0018626 (-.42)	.0014218 (.62)	.0015874 (.67)	-.0015464 (-.62)	.0075183 (1.77*)	-.0009507 (-.40)	.0125899 (2.51**)
Other social expenditure	-.0022943 (-1.60)	-.0036157 (-4.46***)	-.0036465 (-4.38***)	-.0023924 (-2.85***)	-.0121187 (-6.40***)	-.0027424 (-3.45***)	-.015604 (-6.58***)
Bismarck model		-.0041015 (-.23)	-.0136441 (-.64)	.0064201 (.29)		-.0396684 (-1.37)	
Private pension *Bismarck			.1484541 (1.27)			.427524 (3.28***)	
Constant	.3177223 (6.41***)	.3219385 (14.54***)	.3260089 (14.23***)	.4819598 (8.16***)		.6403011 (7.71***)	
Observations	161	161	161	161		161	
Clusters	18	18	18	18		18	
R square	within = 0.2906 between= 0.2296 overall = 0.2916	within = 0.2720 between = 0.4018 overall = 0.4465	within = 0.3097 between = 0.2557 overall = 0.3401	Log likelihood = 429.24809		Log likelihood = 436.16171	

4. Regression with social spending instead of generosity score: Earning-relatedness and universal eligibility models

Variable	Model 2 Random effect model	Model 3 Random effect model	Model 4 Within-effect	Model 4 Between effect	Model 4 Within-effect	Model 4 Between effect
Share of elderly population over 65 years old	-.1412277 (-.92)	-.0439446 (-.28)	-.1450964 (-.88)	-.4631781 (-.91)	-.0686712 (-.42)	-.3617563 (-.77)
Labour Market participation rate of elderly	.0044021 (4.84***)	.0038696 (4.06***)	.0028522 (2.58**)	.0055525 (3.41***)	.0021664 (2.05**)	.0052072 (3.24***)
Real GDP per capita	-1.12e-07 (-.27)	-2.18e-07 (-.52)	1.84e-07 (.44)	-2.34e-06 (-1.63)	1.93e-08 (.05)	-2.20e-06 (-1.66*)
Capital openness	-.0012816 (-.32)	-.0014199 (-.37)	-.0033226 (-.87)	.0167756 (.76)	-.003224 (-.87)	.0094527 (.47)
Relative size private pension	-.0178945 (-1.48)	.0615966 (1.80*)	-.0191327 (-1.32)	-.0034677 (-.07)	.0893067 (2.09**)	.0034472 (.08)
Pension expenditure	.0002842 (.13)	.0004428 (.20)	-.0013792 (-.55)	.0055116 (1.17)	-.002443 (-.10)	.0034584 (.78)
Other social expenditure	-.0032994 (-4.11***)	-.0036888 (-4.54***)	-.0024298 (-2.88***)	-.0105674 (-3.86***)	-.0033272 (-3.75***)	-.0100282 (-4.00***)
Type 1	-.0409518 (-2.66***)	-.0245629 (-1.39)	-.0224111 (-1.17)		-.0284884 (-1.56)	
Type 2	-.0434483 (-2.48**)	-.0243099 (-1.20)	-.0110253 (-.65)		-.0122147 (-.79)	
*Private pension *Type 1*		-.0876071 (-2.44**)			-.1137106 (-2.65***)	
*Private pension * Type 2*		-.1125282 (-2.39**)			-.1539886 (-2.65***)	
Constant	.3591014 (14.44)	.343801 (13.44***)	.4773579 (8.40***)		.4813248 (9.21***)	
Observations	161	161	161		161	
Clusters	18	18	18		18	
R square	within = 0.2749 between = 0.5695 overall = 0.5773	within = 0.3034 between = 0.6167 overall = 0.5977	Log likelihood = 429.82371		Log likelihood = 434.07776	

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5. Jackknife regression: Bismarck Model and Beveridge model

Variable	Model 1	Model 2	Model 3	Model 4			
	Fixed effect model	Random effect model	Random effect model	Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.158188 (-.72)	-.1325582 (-.66)	-.1347554 (-.67)	-.1693264 (.66)	-.5658771 (-2.44**)	-.1793603 (-.73)	-.5538637 (-2.34**)
Labour Market participation rate of elderly	.0026777 (2.49**)	.0027811 (3.49***)	.0027693 (3.43***)	.0027623 (2.39**)	.0032711 (2.37**)	.0026944 (2.38**)	.0034184 (2.40**)
Real GDP per capita	1.47e-07 (.23)	1.44e-07 (.26)	1.46e-07 (.26)	8.22e-08 (.14)	-2.23e-06 (-3.02***)	8.31e-08 (.14)	-2.28e-06 (-3.00***)
Capital openness	-.0086689 (-.89)	-.0077442 (-.83)	-.0078381 (-.83)	-.007773 (-.78)	.0107719 (.96)	-.0080672 (-.81)	.0105135 (.93)
Relative size private pension	-.032235 (-2.78***)	-.0347025 (-3.24***)	-.0345723 (-3.21***)	-.0293443 (-2.30**)	-.1042318 (-1.62)	-.0282364 (-2.22**)	-.1047633 (-1.60)
Welfare generosity	-.007224 (-6.00***)	-.0067398 (-7.27***)	-.0067582 (-7.04***)	-.0070052 (-5.65***)	-.0061813 (-11.43**)	-.0066973 (-4.55***)	-.0062409 (-11.88**)
Bismarck model		.0262307 (1.60)	.0260447 (1.47)	.0068102 (.24)		.0061482 (.21)	
Private pension *Bismarck			.005563 (.09)			.895051 (.66)	
Constant	.5370401 (7.29***)	.5098544 (8.81***)	.5109507 (8.70***)	.6089598 (13.83***)		.6101448 (14.02)	
Observations	175	175	175	175		175	
Clusters	19	19	19	19		19	
R square	within = 0.5048 between= 0.5106 overall = 0.4726	within = 0.5037 between = 0.5716 overall = 0.5616	within = 0.5040 between = 0.5688 overall = 0.5601	Log likelihood = 491.09378		Log likelihood = 491.37085	

6. Jackknife regression: Earning-relatedness and universal eligibility models

Variable	Model 1	Model 2	Model 3			
	Random effect model	Random effect model	Within-effect	Between effect	Within-effect	Between effect
Share of elderly population over 65 years old	-.1060287 (-.59)	.0432111 (-.23)	-.1631673 (-.65)	-.6875681 (-4.75***)	-.1094533 (-.44)	-.7709137 (-5.41***)
Labour Market participation rate of elderly	.0026907 (3.31***)	.002561 (3.00***)	.0024761 (1.95*)	.0031779 (2.29**)	.0019803 (1.56)	.0028092 (2.10**)
Real GDP per capita	1.79e-07 (.32)	1.07e-07 (.19)	1.23e-07 (.20)	-1.82e-06 (-2.82***)	2.03e-08 (.03)	-1.92e-06 (-2.95***)
Capital openness	-.0081212 (-.87)	.0083031 (-.89)	-.0082394 (.83)	-.0026393 (-.08)	-.0084759 (-.85)	-.0044525 (-.12)
Relative size private pension	-.0376727 (-3.86***)	.0206759 (.88)	-.0296605 (-2.32**)	-.0717033 (-.71)	.0565198 (1.90*)	-.0676247 (-.62)
Welfare generosity	-.00064923 (-7.11***)	-.0065014 (-7.57***)	-.0070691 (-5.69***)	-.0045736 (-3.11)	.0073611 (-6.06***)	-.0041907 (-2.63***)
Type 1	-.0296588 (-3.57***)	-.0182341 (-1.73*)	-.02807 (-.88)		-.287383 (-.84)	
Type 2	-.0140818 (-2.78***)	-.0046428 (-.73)	-.0284676 (-1.99**)		-.0308711 (-2.06**)	
Private pension Type 1*		-.0648589 (-2.72***)			-.0921479 (-3.11***)	
*Private pension * Type 2*		-.0667523 (-2.54**)			-.1069681 (-2.67***)	
Constant	.5308436 (8.27***)	.5184296 (8.15***)	.6038232 (14.58***)		.6118587 (15.02***)	
Observations	175	175	175		175	
Clusters	19	19	19		19	
R square	within = 0.5018 between = 0.6332 overall = 0.6117	within = 0.5229 between = 0.6383 overall = 0.6143	Log likelihood = 492.35134		Log likelihood = 496.603	

Appendix B. Statistical appendix to chapter 9: additional regression models

1. Two-way fixed effect model

Variable	Model 1	Model 2	Model 3	Model 4
Share of elderly population over 65 years old	-.0989634 (-.38)	-.044052 (-.22)	.0006936 (.00)	-.0323106 (-.24)
Labour Market participation rate of elderly	.0034844 (1.70)	.003105 (1.88*)	.0029389 (1.67)	.00153 (.90)
Real GDP per capita	-1.95e-06 (-2.46**)	-1.77e-06 (-2.97**)	-1.50e-06 (-2.17**)	-1.22e-06 (-1.87*)
Openness of Capital Market	.0006007 (.11)	-.0005898 (-.09)	.0042829 (.94)	.0014105 (.27)
Relative size private pension	-.0322996 (-2.82**)	-.0226517 (-1.86*)	-.0192667 (-1.93*)	.081676 (1.23)
Size of Welfare state	-.006649 (-4.50***)	-.0050582 (-3.86***)	-.004607 (-3.65***)	-.005015 (-4.86***)
Benefit level (1st tier program)	-.0229146 (-.93)		-.0226378 (-1.24)	-.0088809 (-.88)
Benefit level (2nd tier program)		-.0794626 (-3.15***)	-.0665784 (-2.76**)	-.0345247 (-1.15)
Private pension 1st tier program*				-.2742109 (-4.05***)
*Private pension * 2nd tier program*				.041214 (.47)
Constant	.4804258 (8.40***)	.4750839 (8.75***)	.4489299 (10.00***)	.4347739 (10.44***)
Observations	171	166	165	165
Clusters	19	18	18	18
R Square	within = 0.5880 between = 0.6323 overall = 0.6109	within = 0.6117 between = 0.5886 overall = 0.5889	within = 0.6215 between = 0.6523 overall = 0.6238	within = 0.6665 between = 0.6639 overall = 0.6511

2. Jackknife regression

Variable	Model 4		Model 5	
	Fixed effect model	Random effect model	Within-country effect	Between country effect
Share of elderly population over 65 years old	.0206634 (.10)	.0169276 (.11)	.1308225 (.70)	-.4038968 (-3.19***)
Labour Market participation rate of elderly	.0017428 (1.64)	.0019342 (2.34**)	.0028891 (3.57***)	.0016561 (1.16)
Real GDP per capita	9.34e-08 (.16)	3.29-08 (.06)	-2.63e-07 (-.48)	2.07e-07 (.31)
Openness of Capital Market	.0039769 (.42)	.0044729 (.57)	.0059564 (.76)	.0100115 (1.20)
Relative size private pension	.0642694 (.86)	.0528113 (.80)	-.0603807 (-2.08**)	-.080389 (-4.28***)
Size of Welfare state	-.0043325 (-2.18**)	-.0046876 (-4.09***)	-.004437 (-2.68***)	-.0057716 (-13.11***)
Benefit level (1st tier program)	-.0279597 (-1.84*)	-.0287302 (-1.92*)	-.0510962 (-2.97***)	-.1033959 (-7.66***)
Benefit level (2nd tier program)	-.0584852 (-1.69*)	-.0570655 (-1.95*)	-.0577427 (-2.22**)	-.0397565 (-2.85***)
Private pension 1st tier program*	-.280731 (-2.26**)	-.2774798 (2.46**)	-.8758806 (-2.15**)	
*Private pension * 2nd tier program*	.0719153 (.75)	.0835464 (1.03)	1.06844 (3.89***)	
Constant	.3966313 (4.78***)	.4098032 (6.74***)	.5156772 (15.48***)	
Observations	165	165	165	
Clusters	18	18	18	
R Square	within = 0.5636 between = 0.6801 overall = 0.6221	within = 0.5627 between = 0.6907 overall = 0.6364	Log likelihood = 497.08497	

Appendix C. Statistical appendix to chapter 10: additional regression models

1. Regression with generosity score instead of social expenditure (Luxemburg is dropped)

Variable	Model 1	Model 2	Model 3	Model 4			
	Fixed effect model	Random effect model	Random effect model	Within- effect	Between effect	Within- effect	Between effect
Share of working age population between 16-64	-.197792 (-1.32)	-.2496798 (-2.62***)	-.2283227 (-2.36**)	-.1976659 (-2.37**)	-.4175174 (-1.37)	-.1579036 (-1.63)	-.432048 (-1.39)
ALMP	-.0074611 (-1.04)	-.0077638 (-1.98**)	-.0225071 (-3.18***)	-.0072251 (-1.86*)	-.0196492 (-2.19**)	-.0199043 (-2.83***)	-.0199451 (-2.17***)
Generosity score (UB)	-.0046131 (-2.63**)	-.0039225 (-3.53***)	-.00362 (-3.27***)	-.0046502 (-3.73***)	.0030331 (1.46)	-.0048529 (-3.65***)	.0060065 (1.42)
Generosity score (others)	-.0029222 (-2.03*)	-.002277 (-3.17***)	-.0022525 (-3.16***)	-.0028039 (-3.29***)	-.002128 (-1.99**)	-.0033653 (-3.66***)	-.0021609 (-1.97**)
Real GDP per capita	1.85e-06 (3.83***)	1.52e-06 (8.80***)	1.56e-06+ (8.79***)	1.84e-06 (9.86***)	-2.81e-06 (-3.98***)	1.95e-06 (10.08***)	-2.89e-06 (-3.99***)
Unemployment rate	.001034 (2.11**)	.0011842 (3.39***)	.0010878 (3.06***)	.0010834 (3.16***)	.0002815 (.27)	.0009876 (2.86***)	.0002585 (.24)
Union density	-.0000254 (.958)	-.0005396 (-3.30***)	-.006497 (-4.08***)	-.0000708 (-.33)	-.0008549 (-4.87***)	-.0000641 (-.27)	-.0008603 (-4.79***)
Basic security		-.0059561 (-.46)	-.0275525 (-2.00**)	.0104691 (.88)		.0096122 (.79)	
Residual citizenship		-.0271873 (-2.16**)	-.0447277 (-3.39***)	-.0128869 (-1.25)		-.0126144 (-1.19)	
Last safety net		-.0276865 (-2.16**)	-.0694661 (-2.68***)	-.029089 (-3.31***)		-.029583 (-3.23***)	
Local MIP		.00628 (.45)	-.0053904 (-.37)	.0306051 (2.62***)		.0301094 (2.51**)	
*ALMP*Basic*			.0328509 (2.50**)			.0165458 (1.20)	
*ALMP*Residual*			-.0206832 (2.41**)			.0214512 (2.45**)	
*ALMP*Last safety*			.0134239 (1.20)			.0103975 (.93)	
*ALMP*Local MIP*			.0129983 (.55)			.019297 (.84)	
Constant	.4795628 (5.13***)	.5368342 (8.64***)	.5345054 (8.41***)	.7066757 (3.17***)		.7200149 (3.16***)	
Observations	281	281	281	281		281	
Clusters	20	20	20	20		20	
R square	within = 0.5099 between= 0.4837 overall = 0.5972	within = 0.4972 between = 0.7636 overall = 0.7690	within = 0.5037 between = 0.8044 overall = 0.8007	Log likelihood = 839.53564		Log likelihood = 842.64523	

2. Jackknife regression

Variable	Model 1	Model 2	Model 3	Model 4			
	Fixed effect model	Random effect model	Random effect model	Within- effect	Between effect	Within- effect	Between effect
Share of working age population between 16-64	-.392625 (-3.21***)	-.3882384 (-3.23***)	-.3299899 (-2.68***)	-.4030737 (-3.35***)	-.4293943 (-3.60***)	-.3324921 (-2.67***)	-.4289695 (-3.58***)
ALMP	-.0155058 (-2.72***)	-.0128471 (-2.57***)	-.0225846 (-3.00***)	-.0159959 (2.83***)	-.0095169 (-1.79*)	-.0189042 (-2.39**)	-.0093991 (-1.73*)
Unemployment benefit spending	-.00355503 (-1.26)	-.0040655 (-1.68*)	-.0038603 (-1.52)	-.0029446 (-1.04)	-.0104078 (-4.24***)	-.0022561 (-.75)	-.0103755 (-4.08***)
Other social spending	-.000315 (-.42)	-.0004089 (-.73)	-.0002935 (-.51)	-.0000966 (-.13)	-.0030981 (-5.04***)	-.0002092 (-.27)	-.030672 (-5.05***)
Real GDP per capita	1.13e-06 (4.35***)	9.30e-07 (4.73***)	9.42e-07 (4.72***)	1.08e-06 (4.18***)	-1.30e-06 (-4.29***)	1.07e-06 (4.03***)	-1.27e-06 (-4.17***)
Unemployment rate	.0017663 (2.37**)	.0019272 (2.74***)	.0016778 (2.29**)	.001623 (2.18**)	.0009842 (1.18)	.0014205 (1.81*)	.0010739 (1.26)
Union density	-.0003707 (-.75)	-.0007392 (-3.83***)	-.0008247 (-4.46***)	-.0004109 (-.86)	-.0007549 (-7.76***)	-.0006441 (-1.31)	-.0007585 (-7.75***)
Basic security		.0055585 (1.18)	-.0168896 (-1.88*)	.0004453 (.08)		.0004428 (.08)	
Residual citizenship		-.0415333 (-6.71***)	-.0517226 (-4.71***)	-.0180892 (-4.20***)		-.0174395 (-3.95***)	
Last safety net		-.037692 (-9.06***)	-.0431183 (-4.23***)	-.0170929 (-3.34***)		-.0168542 (-3.23***)	
Local MIP		.015487 (2.59**)	.0099122 (.78)	.0159137 (3.04***)		.0162223 (3.04****)	
*ALMP*Basic*			.0367783 (2.55**)			.0312648 (2.00**)	
*ALMP*Residual*			.0125062 (1.28)			.0039287 (.35)	
*ALMP*Last safety*			.006295 (.64)			-.0003558 (-.04)	
*ALMP*Local MIP*			-.0005848 (-.02)			.0006166 (.02)	
Constant	.5442766 (6.33***)	.5772948 (6.70***)	.548172 (6.12***)	.7245081 (8.27***)		.7215469 (8.23***)	
Observations	281	281	281	281		281	
Clusters	21	21	21	21		21	
R square	within = 0.3883 between = 0.4157 overall = 0.5608	within = 0.3819 between = 0.8457 overall = 0.8240	within = 0.3943 between = 0.8634 overall = 0.8372	Log likelihood = 813.98874		Log likelihood = 816.40588	

3. ANOVA

1) Institutional design of UI/MIP and income inequality

	Number of Observation= 322	R-Squared=.5611	
	Root MSE=. 03907	Adj R-Square=.5556	
Source	Partial Sum of square	F	Prob>F
Institutional design	.35243	101.32	0.0000(***)
Residual	.2756		
Total	.6280		

3) Institutional design of UI/MIP and expenditure on UI

	Number of Observation= 526	R-Squared=.2256	
	Root MSE=. 902	Adj R-Square=.2197	
Source	Partial Sum of square	F	Prob>F
Institutional design	123.558	37.94	0.0000(***)
Residual	424.139		
Total	547.697		

2) Institutional design of UI/MIP and ALMPs

	Number of Observation= 554	R-Squared=.2264	
	Root MSE=. 431	Adj R-Square=.2208	
Source	Partial Sum of square	F	Prob>F
Institutional design	29.920	40.17	0.0000(***)
Residual	102.234		
Total	132.155		

4) Institutional design of UI/MIP and generosity of UI

	Number of Observation= 539	R-Squared=.5518	
	Root MSE=1.681	Adj R-Square=.21975485	
Source	Partial Sum of square	F	Prob>F
Institutional design	1859.547	164.38	0.0000(***)
Residual	1510.215		
Total	3369.763		

Appendix D. Structural features of unemployment benefit and MIP

Type	Country	Main UB is earning-related?	Qualifying period	Duration	MIP supplementary to UB?	Any requirement exist?	MIP exist?
Type 1	Australia	**0**	0	999	n.a.	n.a.	n.a.
	New Zealand	**0**	0	999	n.a.	n.a.	n.a.
	United Kingdom	**0**	12	26	0	1	1
	Ireland	**0**	260	52	0	1	1
Type 2	Finland	0*	34	100	**1**	1	1
	Sweden	0*	52	60	**1**	1	1
	Norway	1	4	104	**1**	1	1
	Luxembourg	1	26	52	**1**	1	1
	Switzerland	1	52	80	**1**	1	0
	Netherlands	*1*	*1040*	*90*	*1*	*1*	*1*
Type 3	Denmark	1	**52**	104	0	1	1
	Portugal	1	**52**	121	0	1	1
	Spain	1	**52**	104	0	0	1
	Canada	1	**45**	42	0	1	1
Type 4	*Belgium*	*1*	*78*	*999*	*0*	*1*	*1*
	France	1	**104**	104	0	1	1
	Germany	1	**104**	52	0	1	1
	Austria	1	**312**	39	0	1	1
Type 5	United States	1	20	99	**n.a.**	**n.a.**	**n.a.**
	Greece	1	42	*52*	**n.a.**	**n.a.**	**n.a.**
	Italy	1	104	*35*	**n.a.**	**n.a.**	**n.a.**

1: Yes 0: NO

Qualifying period and duration is measured in the number of weeks.

*Optional earnings-related UB exists

Abbreviations

ALMPs   Active Labour Market Policies

ANOVA   Analysis of Variance

GLS   Generalised Least Square

GDP   Gross Domestic Product

GNI   Gross Net Income

ICRG   International Country Risk Guide

IMF   International Monetary Fund

MIP   Minimum Income Program

MLM   Multilevel modelling

MPR   Minimum Pension Replacement rate

OECD   Organisation for Economic Co-operation and Development

OLS   Ordinary Least Square

REM   Random Effect Model

SPR   Standard Pension Replacement rate

TSCS   Time Series Cross Sectional

UI   Unemployment Insurance

VAT   Value Added Tax

Bibliography

ADELMAN, I. & MORRIS, C. T. 1973. *Economic growth and social equity in developing countries*, Stanford University Press.

ADEMA, W., FRON, P. & LADAIQUE, M. 2011. Is the European Welfare State Really More Expensive?

ADEMA, W., FRON, P. & LADAIQUE, M. 2014. How much do OECD countries spend on social protection and how redistributive are their tax/benefit systems? *International Social Security Review,* 67, 1-25.

ADEMA, W. & LADAIQUE, M. 2005. Net social expenditure.

ALBER, J. 1981. Government Responses to the Change of Unemployment: The De velopment of Unemployment Insurance in Western Europe. *I Flora & Heiden hammer (red) The Development of Welfare States in Europe and America. New Bruns wick. NJ: Transaction Books*.

ALESINA, A., DI TELLA, R. & MACCULLOCH, R. 2004. Inequality and happiness: are Europeans and Americans different? *Journal of Public Economics,* 88, 2009-2042.

ALESINA, A. & PEROTTI, R. 1994. The political economy of growth: a critical survey of the recent literature. *The World Bank Economic Review,* 8, 351-371.

ALESINA, A. & RODRIK, D. 1991. Distributive politics and economic growth. National bureau of economic research.

ALLISON, P. D. 2009. *Fixed effects regression models*, SAGE publications.

ALVAREZ, P. B. 2001. *The politics of income inequality in the OECD: The role of second order effects*, Maxwell School of Citizenship and Public Affairs, Syracuse University.

ANTOLIN, P., PAYET, S. & YERMO, J. 2012. Coverage of Private Pension Systems.

ANTONIUS, A.W. and JOHN, G., 2002. Three worlds of welfare capitalism or more. *Journal of European Social Policy*, 12(2), pp.137-158.

ATKINSON, A. B. 1970. On the measurement of inequality. *Journal of economic theory,* 2, 244-263.

ATKINSON, A. B. 1997. Bringing income distribution in from the cold. *The Economic Journal,* 107, 297-321.

ATKINSON, A. B. & BRANDOLINI, A. 2009. On data: a case study of the evolution of income inequality across time and across countries. *Cambridge Jounal of Economics,* 33, 381-404.

BABONES, S. J. 2008. Income inequality and population health: correlation and causality. *Social Science & Medicine,* 66, 1614-1626.

BAHLE, T., HUBL, V. & PFEIFER, M. 2011. *The last safety net: A handbook of minimum income protection in Europe*, Policy Press.

BAMBRA, C. & EIKEMO, T. 2008. Welfare state regimes, unemployment and health: a comparative study of the relationship between unemployment and self-reported health in 23 European countries. *Journal of epidemiology and community health*, jech. 2008.077354.

BANKS, J., MARMOT, M., OLDFIELD, Z. & SMITH, J. P. 2006. Disease and disadvantage in the United States and in England. *Jama,* 295, 2037-2045.

BARBIER, J.-C. 2004. Activation policies: a comparative perspective. *Activation polities for young people in international perspective*, 47-83.

BARR, N. 2004. The Economics of the Welfare State, 4 e ed. Oxford: Oxford.

BARRO, R. J. 2000. Inequality and Growth in a Panel of Countries. *Journal of economic growth,* 5, 5-32.

BARTELS, B. 2008. Beyond" fixed versus random effects": a framework for improving substantive and statistical analysis of panel, time-series cross-sectional, and multilevel data. *The Society for Political Methodology*, 1-43.

BASSETT, W. F., BURKETT, J. P. & PUTTERMAN, L. 1999. Income distribution, government transfers, and the problem of unequal influence. *European Journal of Political Economy,* 15, 207-228.

BECK, N. 2001. Time-series-cross-section data: What have we learned in the past few years? *Annual review of political science,* 4, 271-293.

BECK, N. & KATZ, J. N. 1995. What to do (and not to do) with time-series cross-section data. *American political science review,* 89, 634-647.

BECK, N. & KATZ, J. N. 1996. Nuisance vs. substance: Specifying and estimating time-series-cross-section models. *Political analysis,* 6, 1-36.

BELAND, D. 2007. Ideas and institutional change in social security: Conversion,

layering, and policy drift. *Social Science Quarterly,* 88**,** 20-38.

BELL, A. & JONES, K. 2015. Explaining fixed effects: random effects modelling of time-series cross-sectional and panel data. *Political Science Research and Methods,* 3**,** 133-153.

BELLER, E. & HOUT, M. 2006. Welfare states and social mobility: How educational and social policy may affect cross-national differences in the association between occupational origins and destinations. *Research in social stratification and mobility,* 24**,** 353-365.

BENABOU, R. 2000. Unequal societies: Income distribution and the social contract. *American Economic Review***,** 96-129.

BÉNABOU, R. & TIROLE, J. 2006. Incentives and prosocial behavior. *The American economic review,* 96**,** 1652-1678.

BERGH, A. & ERLINGSSON, G. Ó. 2009. Liberalization without retrenchment: Understanding the consensus on Swedish welfare state reforms. *Scandinavian Political Studies,* 32**,** 71-93.

BERRY, C. 2014. Quantity over quality: a political economy of 'active labour market policy'in the UK. *Policy Studies,* 35**,** 592-610.

BIRCHFIELD, V. & CREPAZ, M. M. 1998. The impact of constitutional structures and collective and competitive veto points on income inequality in industrialized democracies. *European Journal of Political Research,* 34**,** 175-200.

BJÖRKLUND, A. & FREEMAN, R. B. 2010. Searching for optimal inequality/incentives. *Reforming the Welfare State: Recovery and Beyond in Sweden.* University of Chicago Press.

BLACKWOOD, D. & LYNCH, R. 1994. The measurement of inequality and poverty: A policy maker's guide to the literature. *World development,* 22**,** 567-578.

BLANK, R. M. & FREEMAN, R. B. 1994. Evaluating the connection between social protection and economic flexibility. *Social protection versus economic flexibility: is there a trade-off?* : University of Chicago Press.

BLAU, J. R. & BLAU, P. M. 1982. The cost of inequality: Metropolitan structure and violent crime. *American Sociological Review***,** 114-129.

BLAU, P. M. & DUNCAN, O. D. 1967. The American occupational structure

BlOSSFELD, H.P. & BUCHHOLZ, S., 2009. Increasing resource inequality among families in modern societies: The mechanisms of growing educational homogamy, changes in the division of work in the family and the decline of the male breadwinner model. Journal of Comparative Family Studies, pp.603-616..

BLUESTONE, B. & HARRISON, B. 1982. The deindustrialization of America: Plant closing, community abandonment, and the dismantling of basic industry. *New York: Basic Book*.

BONOLI, G. 2003. Two worlds of pension reform in Western Europe. *Comparative politics*, 399-416.

BONOLI, G. 2011. Active labour market policy in a changing economic context. *Regulating the Risk of Unemployment National Adaptations to Post-Industrial Labour Markets in Europe, Oxford University Press, Oxford*, 318-332.

BONOLI, G. 2012. Active labour market policy and social investment: a changing relationship. *Towards a social investments welfare state*, 181-204.

BONOLI, G. 2013. *The origins of active social policy: Labour market and childcare policies in a comparative perspective*, OUP Oxford.

BONOLI, G. & NATALI, D. 2012. *The politics of the new welfare state*, Oxford University Press.

BONOLI, G. & PALIER, B. 2007. When Past Reforms Open New Opportunities: Comparing Old-age Insurance Reforms in Bismarckian Welfare Systems. *Social Policy & Administration,* 41, 555-573.

BOUSTAN, L. P., FERREIRA, F., WINKLER, H. & ZOLT, E. 2010. Income inequality and local government in the United States, 1970-2000. National Bureau of Economic Research.

BRADLEY, D., HUBER, E., MOLLER, S., NIELSEN, F. & STEPHENS, J. D. 2003. Distribution and redistribution in post-industrial democracies. *World Politics,* 55, 193-228.

BRADY, D.& Huber, E & STEPHENS, J. D. 2014. Comparative Welfare States Data Set, University of North Carolina and WZB Berlin Social Science Centre.

Accessed 24/11/2014 at http://www.lisdatacenter.org/resources/other-databases/

BRADY, D. & BURROWAY, R. 2012. Targeting, universalism, and single-mother poverty: a multilevel analysis across 18 affluent democracies. *Demography,* 49**,** 719-746.

BROOKS, S. M. 2005. Interdependent and domestic foundations of policy change: The diffusion of pension privatization around the world. *International Studies Quarterly,* 49**,** 273-294.

BRYAN, M. L. & JENKINS, S. P. 2013. Regression analysis of country effects using multilevel data: A cautionary tale.

BUTRICA, B. A., SMITH, K. E. & IAMS, H. 2003. It's all relative: Understanding the retirement prospects of baby-boomers. *Boston College Center for Retirement Research*.

CALMFORS, L. & SKEDINGER, P. 1995. Does active labour-market policy increase employment? Theoretical considerations and some empirical evidence from Sweden. *Oxford Review of Economic Policy,* 11**,** 91-109.

CAMINADA, K. & GOUDSWAARD, K. 2001. International trends in income inequality and social policy. *International Tax and Public Finance,* 8**,** 395-415.

CAMINADA, K. & GOUDSWAARD, K. 2005. Are public and private social expenditures complementary? *International Advances in Economic Research,* 11**,** 175-189.

CAMINADA, K., GOUDSWAARD, K. & KOSTER, F. 2012. Social income transfers and poverty: A cross-country analysis for OECD countries. *International Journal of Social Welfare,* 21**,** 115-126.

CANTILLON, B. 2010. Disambiguating Lisbon. Growth, employment and social inclusion in the investment state.

CANTILLON, B. 2011. The paradox of the social investment state: growth, employment and poverty in the Lisbon era. *Journal of European Social Policy,* 21**,** 432-449.

CARD, D. & DINARDO, J. E. 2002. Skill biased technological change and rising wage inequality: some problems and puzzles. National Bureau of Economic

Research.

CARD, D., KLUVE, J. & WEBER, A. 2010. Active labour market policy evaluations: a meta-analysis*. *The Economic Journal,* 120**,** F452-F477.

CARD, D., KLUVE, J. & WEBER, A. 2015. What works? A meta-analysis of recent active labor market program evaluations. National Bureau of Economic Research.

CARRASCO, R. 1999. Transitions to and from self-employment in Spain: an empirical analysis. *oxford Bulletin of Economics and Statistics,* 61**,** 315-341.

CASTLES, F. G. 1982. The impact of parties on public expenditure. *The impact of parties: Politics and policies in democratic capitalist states***,** 21-96.

CASTLES, F. G. 1989. *The comparative history of public policy*, Oxford University Press.

CASTLES, F. G. 2002. Developing new measures of welfare state change and reform. *European Journal of Political Research,* 41**,** 613-641.

CASTLES, F. G. 2004. *The future of the welfare state: Crisis myths and crisis realities*, Oxford University Press on Demand.

CASTLES, F. G. & MITCHELL, D. 1992. Identifying welfare state regimes: the links between politics, instruments and outcomes. *Governance,* 5**,** 1-26.

CASTLES, F. G. & OBINGER, H. 2007. Social expenditure and the politics of redistribution. *Journal of European Social Policy,* 17**,** 206-222.

CHEVAN, A. & STOKES, R. 2000. Growth in family income inequality, 1970–1990: Industrial restructuring and demographic change. *Demography,* 37**,** 365-380.

CHINN, M. D. & ITO, H. 2006. What Matters for Financial Development? Capital Controls, Institutions, and Interactions, *Journal of Development Economics*, 81, 163-192 (October). Accessed on 24/11/2014 at http://web.pdx.edu/~ito/Chinn-Ito_website.htm

CHINN, M. D. & ITO, H. 2008. A new measure of financial openness. *Journal of comparative policy analysis,* 10**,** 309-322.

CHONG, A. & GRADSTEIN, M. 2007. Inequality and institutions. *The Review of Economics and Statistics,* 89**,** 454-465.

CLARK, A. E. 2003. Unemployment as a social norm: Psychological evidence from

panel data. *Journal of labor economics,* 21**,** 323-351.

CLARKWEST, A. 2008. Confounding and process-model fit in research on income

inequality and population health: a rejoinder to Zimmerman and Glymour.

Social Science & Medicine, 66**,** 1903-1908.

CLASEN, J. & CLEGG, D. 2011. *Regulating the risk of unemployment: National*

adaptations to post-industrial labour markets in Europe, Oxford University

Press.

CLASEN, J., CLEGG, D. & GOERNE, A. 2016. Comparative Social Policy Analysis and

Active Labour Market Policy: Putting Quality before Quantity. *Journal of*

Social Policy, 45**,** 21-38.

CLAUS, I., MARTINEZ-VAZQUEZ, J. & VULOVIC, V. 2012. Government fiscal policies

and redistribution in Asian countries. *Andrew Young School of Policy Studies*

Research Paper Series.

CLAYTON, R. & PONTUSSON, J. 1998. Welfare-state retrenchment revisited:

entitlement cuts, public sector restructuring, and inegalitarian trends in

advanced capitalist societies. *World Politics,* 51**,** 67-98.

COLMAN, D. N. F.(1988) Economics of change in less developed countries, Philip

Allan. Trowbridge.

CO-OPERATION, O. F. E. & DEVELOPMENT 2007. *Pensions at a Glance: Public*

Policies Across OECD Countries 2007 Edition, Organisation for Economic Co-

operation and Development.

COX, R. H. 2001. The social construction of an imperative: why welfare reform

happened in Denmark and the Netherlands but not in Germany. *World*

politics, 53**,** 463-498.

CRENSHAW, E. 1992. Cross-national determinants of income inequality: A

replication and extension using ecological-evolutionary theory. *Social Forces,*

71**,** 339-363.

DABLA-NORRIS, M. E., KOCHHAR, M. K., SUPHAPHIPHAT, M. N., RICKA, M. F. &

TSOUNTA, E. 2015. *Causes and consequences of income inequality: a global*

perspective, International Monetary Fund.

DE DEKEN, J. 2013. Towards an index of private pension provision. *Journal of*

European Social Policy, 23, 270-286.

DE DEKEN, J. & KITTEL, B. 2007. Social expenditure under scrutiny: The problems of using aggregate spending data for assessing welfare state dynamics. *Clasen, Jochen/Siegel, Nico A,* 72-105.

DEATON, A. & LUBOTSKY, D. 2003. Mortality, inequality and race in American cities and states. *Social science & medicine,* 56, 1139-1153.

DEININGER, K. & SQUIRE, L. 1996. A new data set measuring income inequality. *The World Bank Economic Review,* 10, 565-591.

DEININGER, K. & SQUIRE, L. 1997. Economic growth and income inequality: Reexamining the links. *Finance & development,* 38-41.

DISNEY, R. 2004. Are contributions to public pension programmes a tax on employment? *Economic Policy,* 19, 268-311.

DOLAN, P., PEASGOOD, T. & WHITE, M. 2008. Do we really know what makes us happy? A review of the economic literature on the factors associated with subjective well-being. *Journal of Economic Psychology,* 29, 94-122.

DREHER, A. 2006. The influence of globalisation on taxes and social policy: An empirical analysis for OECD countries. *European Journal of Political Economy,* 22, 179-201.

DREHER, A. & GASTON, N. 2008. Has globalisation increased inequality? *Review of international economics,* 16, 516-536.

DUNCAN, D. & SABIRIANOVA PETER, K. 2008. Tax progressivity and income inequality. *Andrew Young School of Policy Studies Research Paper Series*.

DURKHEIM, E. 1997. *The division of labor in society*, Simon and Schuster.

DYNAN, K. E., SKINNER, J. & ZELDES, S. P. 2000. Do the rich save more? : National Bureau of Economic Research.

EASTERLIN, R. A. 1995. Will raising the incomes of all increase the happiness of all? *Journal of Economic Behavior & Organization,* 27, 35-47.

EASTERLY, W. 2001. The middle class consensus and economic development. *Journal of economic growth,* 6, 317-335.

EASTERLY, W., KING, R., LEVINE, R. & REBELO, S. 1994. Policy, technology adoption, and growth. National Bureau of Economic Research.

EBBINGHAUS, B. 2006. The politics of pension reform: Managing interest group conflicts.

EBBINGHAUS, B. 2012. Europe's transformations towards a renewed pension system. *The politics of the new welfare state***,** 182.

EIKEMO, T. A., BAMBRA, C., JUDGE, K. & RINGDAL, K. 2008. Welfare state regimes and differences in self-perceived health in Europe: a multilevel analysis. *Social science & medicine,* 66**,** 2281-2295.

ESPING-ANDERSEN, G. 1990. *The three worlds of welfare capitalism*, Polity press Cambridge.

ESPING-ANDERSEN, G. 2007. Sociological explanations of changing income distributions. *American Behavioral Scientist,* 50**,** 639-658.

ESPING-ANDERSEN, G. 2009. *Incomplete revolution: Adapting welfare states to women's new roles*, Polity.

FERRER-I-CARBONELL, A. & FRIJTERS, P. 2004. How important is methodology for the estimates of the determinants of happiness? *The Economic Journal,* 114**,** 641-659.

FIELDS, G. S. & FEI, J. C. 1978. On inequality comparisons. *Econometrica: Journal of the Econometric Society***,** 303-316.

FINN, D. 2012. Sub-contracting in public employment services: the design and delivery of outcome based and black box contracts. *European Commission: DG Employment, Social Affairs and Inclusion*.

FISZBEIN, A. & PSACHAROPOULOS, G. 1995. Income inequality trends in Latin America in the 1980s. *Coping with austerity: poverty and inequality in Latin America***,** 71-100.

FLORA, P. & HEIDENHEIMER, A. J. 1981. *The development of welfare states in Europe and America*, Transaction Publishers.

FODEN, D. & JEPSEN, M. 2002. Active strategies for older workers in the European Union: A comparative analysis of recent experiences. *Active strategies for older workers in the European Union***,** 437-460.

FORBES, K. J. 2000. A Reassessment of the Relationship between Inequality and Growth. *American economic review***,** 869-887.

FÖRSTER, M. F. & MIRA D'ERCOLE, M. 2005. Income Distribution and Poverty in OECD Countries in the Second Half of the 1990s.

FRITZELL, J. 1991. The gap between market rewards and economic well-being in modern societies. *European Sociological Review,* 7, 19-33.

FUKAWA, T. 2006. Sustainable structure of the Japanese public pension system viewed from a Germany-Japan comparison. *The Japanese Journal of Social Security Policy,* 6, 131-143.

GABE, T. & WHITTAKER, J. M. 2012. Antipoverty Effects of Unemployment Insurance.

GALLO, C. 2002. Economic growth and income inequality: Theoretical background and empirical study. *UCL working paper No.119*.

GALOR, O. & TSIDDON, D. 1997. Technological progress, mobility, and economic growth. *The American Economic Review,* 363-382.

GARDINER, J., ROBINSON, A. M. & FAKHFAKH, F. 2015. Exploring the private pension gender gap and occupation in later working life. *Work, Employment & Society,* 0950017015575868.

GARRETT, G. & MITCHELL, D. 2001. Globalization, government spending and taxation in the OECD. *European Journal of Political Research,* 39, 145-177.

GHYSELS, J. & VAN LANCKER, W. 2011. The unequal benefits of activation: an analysis of the social distribution of family policy among families with young children. *Journal of European social policy,* 21, 472-485.

GLOMM, G. & RAVIKUMAR, B. 2003. Public education and income inequality. *European Journal of Political Economy,* 19, 289-300.

GOERNE, A. & CLEGG, D. 2013. National Report: UK. Research Report for the Project Combating Poverty in Europe (COPE), http://cope-research. eu/wpcontent/uploads/2013/05/National_Report_UK. pdf.

GOTTSCHALK, P. & DANZIGER, S. 1985. A framework for evaluating the effects of economic growth and transfers on poverty. *The American Economic Review,* 153-161.

GOUGH, I. 2001. Social assistance regimes: a cluster analysis. *Journal of European social policy,* 11, 165-170.

GOUGH, I., BRADSHAW, J., DITCH, J., EARDLEY, T. & WHITEFORD, P. 1997. Social assistance in OECD countries. *Journal of European social policy,* 7**,** 17-43.

GOULD, E. D. & PASERMAN, M. D. 2003. Waiting for Mr. Right: rising inequality and declining marriage rates. *Journal of Urban Economics,* 53**,** 257-281.

GRAHAM, C. 2002. Mobility, opportunity and vulnerability: the dynamics of poverty and inequality in a global economy. *Journal of Human Development,* 3**,** 57-94.

GRAHAM, C., EGGERS, A. & SUKHTANKAR, S. 2004. Does happiness pay?: An exploration based on panel data from Russia. *Journal of Economic Behavior & Organization,* 55**,** 319-342.

GREEN-PEDERSEN, C. 2001. Minority governments and party politics: the political and institutional background to the "Danish miracle". *Journal of Public Policy,* 21**,** 53-70.

GREEN-PEDERSEN, C. 2001. Welfare-state Retrenchment in Denmark and the Netherlands, 1982-1998 The Role of Party Competition and Party Consensus. *Comparative Political Studies,* 34**,** 963-985.

GREEN-PEDERSEN, C. 2002. *The politics of justification: party competition and welfare-state retrenchment in Denmark and the Netherlands from 1982 to 1998*, Amsterdam University Press.

GREENWOOD, J. & JOVANOVIC, B. 1990. Financial development and economic development. *Economic Development and Cultural Change,* 15**,** 257-268.

GRUBER, J. & CULLEN, J. B. 1996. Spousal Labour Supply as Insurance: Does Unemployment Insurance Crowd Out the Added Worker Effect? : National Bureau of Economic Research.

HACKER, J. S. 2004. Privatizing risk without privatizing the welfare state: The hidden politics of social policy retrenchment in the United States. *American Political Science Review,* 98**,** 243-260.

HACKER, J. S. & PIERSON, P. 2010. Winner-take-all politics: Public policy, political organization, and the precipitous rise of top incomes in the United States. *Politics & Society,* 38**,** 152-204.

HACKER, J. S. & PIERSON, P. 2011. *Winner-take-all politics*, Tantor Media,

Incorporated.

HARBERGER, A. C. 1995. The ABCs of Corporation Tax Incidence: Insights into the Open-Economy Case. *Monograph Series on Tax, Regulatory, and Environmental Policies and US Economic Growth*.

HARBERGER, A. C. 2006. Taxation and Income Distribution: Myths and Realities. *The challenges of tax reform in a global economy*, 13-37.

HAUGHTON, D. & NGUYEN, P. 2010. Multilevel models and inequality in Vietnam. *Journal of Data Science,* 8, 289-306.

HESHMATI, A. 2004. Inequalities and their measurement.

HICKS, A. & MISRA, J. 1993. Political resources and the growth of welfare in affluent capitalist democracies, 1960-1982. *American Journal of Sociology*, 668-710.

HINRICHS, K. 2000. Elephants on the move. Patterns of public pension reform in OECD countries. *European Review,* 8, 353-378.

HOFMANN, B. 2008. Work incentives? ex post effects of unemployment insurance sanctions-evidence from West Germany.

HÖLSCH, K. & KRAUS, M. 2004. Poverty alleviation and the degree of centralization in European schemes of social assistance. *Journal of European Social Policy,* 14, 143-164.

HOPKIN, J. & LYNCH, J. 2016. Winner-Take-All Politics in Europe? European Inequality in Comparative Perspective. *Politics & Society,* 44, 335-343.

HOX, J. J. 2002. *Multilevel analysis: Techniques and applications*, Psychology Press.

HSIEH, C.-C. & PUGH, M. D. 1993. Poverty, income inequality, and violent crime: a meta-analysis of recent aggregate data studies. *Criminal Justice Review,* 18, 182-202.

HUBER, E. & STEPHENS, J. D. 1998. Internationalization and the Social Democratic Model Crisis and Future Prospects. *Comparative political studies,* 31, 353-397.

HUDSON, J. & KÜHNER, S. 2010. Beyond the dependent variable problem: The methodological challenges of capturing productive and protective dimensions of social policy. *Social Policy and Society,* 9, 167-179.

HUGHES, G. & STEWART, J. 2004. *Reforming Pensions in Europe*, Edward Elgar
Publishing.

IMMERVOLL, H. & RICHARDSON, L. 2011. Redistribution policy and inequality
reduction in OECD countries: what has changed in two decades?

IVERSEN, T. & CUSACK, T. R. 2000. The causes of welfare state expansion:
deindustrialization or globalization? *World politics,* 52**,** 313-349.

IVERSEN, T. & SOSKICE, D. 2006. Electoral institutions and the politics of coalitions:
Why some democracies redistribute more than others. *American Political
Science Review,* 100**,** 165-181.

JÄNTTI, M., KANGAS, O. & RITAKALLIO, V. M. 1996. From marginalism to
institutionalism: distributional consequences of the transformation of the
Finnish pension regime. *Review of Income and Wealth,* 42**,** 473-491.

JAUMOTTE, F., LALL, S. & PAPAGEORGIOU, C. 2013. Rising income inequality:
technology, or trade and financial globalization? *IMF Economic Review,* 61**,**
271-309.

JAUMOTTE, F., LALL, S. & PAPAGEORGIOU, C. 2013. Rising income inequality:
technology, or trade and financial globalization? *IMF Economic Review,* 61**,**
271-309.

JAUMOTTE, F. & OSORIO-BUITRON, C. 2015. Inequality and labour market
institutions. *Available at SSRN 2678639*.

JENKINS, S. 1991. The measurement of income inequality. *Economic Inequality and
Poverty***,** 3-31.

JENSON, J. 2012. A new politics for the social investment perspective. *The politics
of the new welfare state***,** 21-44.

JIMENEZ, E. 1986. THE PUBLIC SUBSIDIZATION OF EDUCATION AND HEALTH IN
DEVELOPING COUNTRIES A Review of Equity and Efficiency. *The World Bank
Research Observer,* 1**,** 111-129.

JOHANSSON, Å., GUILLEMETTE, Y., MURTIN, F., TURNER, D., NICOLETTI, G., DE LA
MAISONNEUVE, C., BOUSQUET, G. & SPINELLI, F. 2012. Looking to 2060:
Long-term global growth prospects.

JOHNSON, T. R. & KLEPINGER, D. H. 1994. Experimental evidence on

unemployment insurance work-search policies. *Journal of Human Resources*, 695-717.

KAKWANI, N. & SUBBARAO, K. 2007. Poverty among the elderly in sub-Saharan Africa and the role of social pensions. *The Journal of Development Studies,* 43, 987-1008.

KANGAS, O. & PALME, J. 2000. Does social policy matter? Poverty cycles in OECD countries. *International Journal of Health Services,* 30, 335-352.

KAPLAN, G. A., PAMUK, E. R., LYNCH, J. W., COHEN, R. D. & BALFOUR, J. L. 1996. Inequality in income and mortality in the United States: analysis of mortality and potential pathways. *Bmj,* 312, 999-1003.

KAPTEYN, A., VAN PRAAG, B. M. & VAN HERWAARDEN, F. G. 1978. Individual welfare functions and social reference spaces. *Economics Letters,* 1, 173-177.

KARL, P. 1944. The Great Transformation: The Political and Economic Origins of Our Time. *Boston: Beacon*.

KEEFER, P. & KNACK, S. 2002. Polarization, politics and property rights: Links between inequality and growth. *Public choice,* 111, 127-154.

KELLY, N. J. 2009. *The politics of income inequality in the United States*, Cambridge University Press.

KEMP-BENEDICT, E. 2011. Political regimes and income inequality. *Economics Letters,* 113, 266-268.

KEMP-BENEDICT, E. 2011. Political regimes and income inequality. *Economics Letters,* 113, 266-268.

KENWORTHY, L. 2010. Rising Inequality, Public Policy, and America's Poor. *Challenge,* 53, 93-109.

KENWORTHY, L. & PONTUSSON, J. 2005. Rising inequality and the politics of redistribution in affluent countries. *Perspective on politics,* 3, 449-471.

KERSBERGEN, K. V. & VIS, B. 2014. Comparative Welfare State Politics. Cambridge University Press: New York.

KIDD, S. & WHITEHOUSE, E. 2009. Pensions and old-age poverty. *Closing the Coverage Gap: The Role of Social Pensions and Other Retirement Income Transfers*.

KING, D. 1995. *Actively seeking work?: the politics of unemployment and welfare policy in the United States and Great Britain*, University of Chicago Press.

KITTEL, B. & OBINGER, H. 2003. Political parties, institutions, and the dynamics of social expenditure in times of austerity. *Journal of European public policy,* 10**,** 20-45.

KITTEL, B. & WINNER, H. 2005. How reliable is pooled analysis in political economy? The globalization-welfare state nexus revisited. *European Journal of Political Research,* 44**,** 269-293.

KNIGHT, J. B. & SABOT, R. H. 1983. Educational expansion and the Kuznets effect. *The American Economic Review,* 73**,** 1132-1136.

KOHL, J. 1990. *Minimum standards in old age security and the problem of poverty in old age*, INSTEAD.

KOLLMEYER, C. 2012. Family structure, Female employment, and National income inequality: A cross-National study of 16 Western countries. *LIS working paper No.579*.

KOLLMEYER, C. 2012. Family structure, female employment, and national income inequality: A cross-national study of 16 western countries. *European sociological review***,** jcs060.

KONDO, N., SEMBAJWE, G., KAWACHI, I., VAN DAM, R. M., SUBRAMANIAN, S. & YAMAGATA, Z. 2009. Income inequality, mortality, and self-rated health: meta-analysis of multilevel studies. *Bmj,* 339**,** b4471.

KORPI, W. 2000. Faces of inequality: Gender, class, and patterns of inequalities in different types of welfare states. *Social Politics: international studies in gender, state & society,* 7**,** 127-191.

KORPI, W. 2006. Power resources and employer-centered approaches in explanations of welfare states and varieties of capitalism: Protagonists, consenters, and antagonists. *World politics,* 58**,** 167-206.

KORPI, W. & PALME, J. 1998. The paradox of redistribution and strategies of equality: Welfare state institutions, inequality, and poverty in the Western countries. *American sociological review***,** 661-687.

KORPI, W. & PALME, J. 2003. New politics and class politics in the context of

austerity and globalization: Welfare state regress in 18 countries, 1975-95. *American Political Science Review,* 97**,** 425-446.

KREFT, I. G., KREFT, I. & DE LEEUW, J. 1998. *Introducing multilevel modeling*, Sage.

KÜHNER, S. 2007. Country-level comparisons of welfare state change measures: Another facet of the dependent variable problem within the comparative analysis of the welfare state. *Journal of European Social Policy,* 17**,** 5-18.

KÜHNER, S. 2010. Do party governments matter after all? Executive ideology, constitutional structures and their combined effect on welfare state change. *Journal of Comparative Policy Analysis,* 12**,** 395-415.

KÜHNER, S. 2015. What if we waited a little longer? The dependent variable problem within the comparative analysis of the welfare state revisited. *Social Policy Review 27: Analysis and Debate in Social Policy, 2015,* 27**,** 199.

KÜNEMUND, H. & REIN, M. 1999. There is more to receiving than needing: Theoretical arguments and empirical explorations of crowding in and crowding out. *Ageing and society,* 19**,** 93-121.

KUZNETS, S. 1955. Economic growth and income inequality. *The American economic review,* 45**,** 1-28.

LADD, E. C. & BOWMAN, K. H. 1998. *Attitudes toward economic inequality*, Aei Press.

LE GRAND, J. 1989. *The strategy of equality*, Allen & Unwin.

LE GRAND, J. & GOODIN, R. 1987. Not Only the Poor. London: Allen & Unwin.

LEFÈBVRE, M. 2007. The redistributive effects of pension systems in Europe: A survey of evidence. *Luxembourg: Luxembourg Income Study***,** 17.

LEIGH, A., JENCKS, C., SMEEDING, T., SALVERDA, W. & SMEEDING, T. 2009. Health and economic inequality. *The Oxford Handbook of Economic Inequality***,** 384-405.

LEIGHTNER, J. E. 1992. The compatibility of growth and increased equality: Korea. *Journal of development studies,* 29**,** 49-71.

LEON, D. A., VÅGERÖ, D. & OLAUSSON, P. O. 1992. Social class differences in infant mortality in Sweden: comparison with England and Wales. *BMJ,* 305**,** 687-691.

LERMAN, R. I. 1996. The impact of the changing US family structure on child poverty and income inequality. *Economica*, S119-S139.

LIVING, E. F. F. T. I. O. & CONDITIONS, W. 2007. Approaches to flexicurity: EU models. *Luxembourg: Office for Official Publications of the European Communities*.

LØDEMEL, I. & SCHULTE, B. 1992. Social Assistance: a part of social security or the poor law in new disguise. *Reforms in Eastern and Central Europe: Beveridge 50 years after*.

LYLE SCRUGGS, J. P. A. 2006. The material consequence of welfare states: Benefit generosity and Absolute poverty in 16 OECD countries. *Comparative political studies,* 39, 880-904.

LYNCH, J., SMITH, G. D., HARPER, S. & HILLEMEIER, M. 2004. Is income inequality a determinant of population health? Part 2. US national and regional trends in Income inequality and age-and cause-specific mortality. *Milbank Quarterly,* 82, 355-400.

MAAS, C. J. & HOX, J. J. 2005. Sufficient sample sizes for multilevel modelling. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences,* 1, 86-92.

MAHONEY, J. & RUESCHEMEYER, D. 2003. *Comparative historical analysis in the social sciences*, Cambridge University Press.

MARKS, G. N. & FLEMING, N. 1999. Influences and consequences of well-being among Australian young people: 1980–1995. *Social Indicators Research,* 46, 301-323.

MARSHALL, T. H. 1950. *Citizenship and social class*, Cambridge.

MARTIN, M. A. 2006. Family structure and income inequality in families with children, 1976 to 2000. *Demography,* 43, 421-445.

MATTHIAS MATTHIJS. 2016. The Euro's "Winner-Take All" Political Economy: Institutional Choices, Policy Drift, and Diverging Patterns of Inequality. *Politics and Society,*44. 392-422

MCFAUL, M. 2002. The Fourth Wave of Democracy and Dictatorship. *World politics,* 54, 212-44.

MCLANAHAN, S. & PERCHESKI, C. 2008. Family structure and the reproduction of inequalities. *Annu. Rev. Sociol,* 34**,** 257-276.

MEARA, E. R., RICHARDS, S. & CUTLER, D. M. 2008. The gap gets bigger: changes in mortality and life expectancy, by education, 1981–2000. *Health Affairs,* 27**,** 350-360.

MELLOR, J. M. & MILYO, J. 2001. Re-examining the evidence of an ecological association between income inequality and health. *Journal of Health Politics, Policy and Law,* 26**,** 487-522.

MELTZER, A. H. & RICHARD, S. F. 1981. A rational theory of the size of government. *The Journal of Political Economy***,** 914-927.

MERTON, R. K. 1968. The Matthew effect in science. *Science,* 159**,** 56-63.

MILANOVIC, B. 1996. Income, inequality and poverty during the transition: A survey of the evidence. *MOCT-MOST: Economic Policy in Transitional Economies,* 6**,** 131-147.

MILANOVIĆ, B. 2000. Determinants of cross-country income inequality: An 'augmented' Kuznets hypothesis. *Equality, Participation, Transition.* Springer.

MITCHELL, D. 1991. *Income transfers in ten welfare states*, Avebury.

MITCHELL, D., HARDING, A. & GRUEN, F. 1994. Targeting welfare. *Economic Record,* 70**,** 315-340.

MKANDAWIRE, T. & DEVELOPMENT, U. N. R. I. F. S. 2001. *Social policy in a development context*, United Nations Research Institute for Social Development Geneva.

MKANDAWIRE, T. & DEVELOPMENT, U. N. R. I. F. S. 2005. *Targeting and universalism in poverty reduction*, United Nations Research Institute for Social Development Geneva.

MOLLER, S., HUBER, E., STEPHENS, J. D., BRADLEY, D. & NIELSEN, F. 2003. Determinants of relative poverty in advanced capitalist democracies. *American Sociological Review***,** 22-51.

MOREL, N., PALIER, B. & PALME, J. 2012. *Towards a social investment welfare state?: ideas, policies and challenges*, Policy Press.

MUINELO GALLO, W. L. & ROCA I SAGALÉS, O. 2011. Economic growth and

inequality.

MULLER, E. N. 1985. Income inequality, regime repressiveness, and political violence. *American Sociological Review*, 47-61.

MULLER, J. 2013. capitalism and inequality. *Foreign affairs,* 92, 30-51.

MUNCH, J. R. & SKAKSEN, J. R. 2009. Specialization, outsourcing and wages. *Review of world economics,* 145, 57-73.

MUNDLAK, Y. 1978. On the pooling of time series and cross section data. *Econometrica: journal of the Econometric Society*, 69-85.

MUTUAL INFORMATION SYSTEM ON SOCIAL PROTECTION (MISSOC). (2013). MISSOC Comparative Tables. [Online]. Brussels: European Commission. Accessed frequently in 2014 at http://www.missoc.org/MISSOC/INFORMATIONBASE/COMPARATIVETABLES/MISSOCDATABASE/comparativeTableSearch.jsp

MYLES, J. & PIERSON, P. 2001. The comparative political economy of pension reform. *The new politics of the welfare state,* 305, 322-23.

NELSON, K. 2007. Universalism versus targeting: The vulnerability of social insurance and means-tested minimum income protection in 18 countries, 1990-2002. *International Social Security Review,* 60, 33-58.

OCDE, I. I. T. 2015. Why Less Inequality Benefits All. Paris: OECD Publishing.

O'CONNOR, J. 1979. *The fiscal crisis of the state*, Transaction Publishers.

OECD 2011. *An overview of Growing income inequalities in OECD countries: Main findings*, OECD publishing.

OECD 2013. Crisis squeeze income and puts pressure on inequality and poverty.

OECD 2013. Pensions at a Glance 2013: OECD and G20 Indicators. OECD Paris.

OECD SOCX, Accessed frequently during 2013-15 at http://stats.oecd.org/index.aspx

OHMAE, K. 1994. *The borderless world: Power and strategy in the global marketplace*, HarperCollins.

OKUN, A. M. 1975. *Equality and efficiency: The big trade-off*, Brookings Institution Press.

ORENSTEIN, M. A. 2008. Out-liberalizing the EU: pension privatization in Central

and Eastern Europe. *Journal of European Public Policy,* 15**,** 899-917.

OSBERG, L., SMEEDING, T. M. & SCHWABISH, J. 2004. Income distribution and public social expenditure: Theories, effects, and evidence. *Social inequality***,** 821-59.

PALME, J. 2006. Welfare states and inequality: Institutional designs and distributive outcome. *Research in Social stratification and Mobility,* 24**,** 387-403.

PASKOV, M. & DEWILDE, C. 2012. Income inequality and solidarity in Europe. *Research in Social Stratification and Mobility*.

PAUKERT, F. 1973. Income distribution at different levels of development: A survey of evidence. *Int'l Lab. Rev.,* 108**,** 97.

PECK, J. 2001. Workfare versus the cities. *Urban Geography,* 22**,** 493-498.

PEROTTI, R. 1996. Growth, income distribution, and democracy: what the data say. *Journal of Economic growth,* 1**,** 149-187.

PERSSON, T. & TABELLINI, G. 1994. Is inequality harmful for growth? *The American Economic Review***,** 600-621.

PERSSON, T. & TABELLINI, G. E. 2003. *Do electoral cycles differ across political systems?*, Innocenzo Gasparini Institute for Economic Research.

PIERSON, C. 2004. 'Late Industrializers' and the Development of the Welfare State. *Social policy in a development context.* Springer.

PIERSON, C. & CASTLES, F. G. 2006. *The welfare state reader*, Polity.

PIERSON, P. 2001. *The new politics of the welfare state*, Oxford University Press on Demand.

PIERSON, P. 2004. *Politics in time: History, institutions, and social analysis*, Princeton University Press.

PIKETTY, T. 2014. Capital in the 21st Century. *Cambridge: Harvard Uni.*

PISCHKE, J.-S. & ANGRIST, J. 2009. Mostly Harmless Econometrics: An Empiricist's Companion. Oxfordshire: Princeton University Press.

PLÜMPER, T., TROEGER, V. E. & MANOW, P. 2005. Panel data analysis in comparative politics: Linking method to theory. *European Journal of Political Research,* 44**,** 327-354.

PODESTÀ, F. 2006. Comparing time series cross-section model specifications: the

case of welfare state development. *Quality and Quantity,* 40**,** 539-559.

PRESTON, S. H. 1975. The changing relation between mortality and level of economic development. *Population studies,* 29**,** 231-248.

PRSKAWETZ, A. & LINDH, T. 2007. The relationship between demographic change and economic growth in the EU. *Vienna Institute of Demography, Research Report,* 32.

PUBLISHING, O. 2011. *Pensions at a Glance 2011: Retirement-income Systems in OECD and G20 Countries*, Organisation for Economic Co-operation and Development.

PUTNAM, R. D. 1995. Bowling alone: America's declining social capital. *Journal of democracy,* 6**,** 65-78.

PUTNAM, R. D. 2001. *Bowling alone*, Simon and Schuster. com.

QUEISSER, M. & WHITEHOUSE, E. 2005. Pensions at a glance: public policies across OECD countries.

QUEISSER, M., WHITEHOUSE, E. & WHITEFORD, P. 2007. The public–private pension mix in OECD countries. *Industrial Relations Journal,* 38**,** 542-568.

RAM, R. 2005. Income inequality, poverty, and population health: evidence from recent data for the United States. *Social science & medicine,* 61**,** 2568-2576.

RAM, R. 2006. Further examination of the cross-country association between income inequality and population health. *Social science & medicine,* 62**,** 779-791.

RAUCH, J. 2012. Inequality and its Perils. *National Journal*.

RAUDENBUSH, S. W. 1989. The analysis of longitudinal, multilevel data. *International journal of educational research,* 13**,** 721-740.

REED, W. R. & YE, H. 2011. Which panel data estimator should I use? *Applied Economics,* 43**,** 985-1000.

REICH, R. 1991. The work of nations: Preparing ourselves for twenty-first century capitalism. *New York: Alfred Knopf*.

RIGNEY, D. 2010. *Matthew Effect*, Columbia University Press.

RIGNEY, D. 2013. *The Matthew effect: How advantage begets further advantage*, Columbia University Press.

RIMLINGER, G. V. 1966. Welfare policy and economic development: a comparative historical perspective. *The Journal of Economic History,* 26**,** 556-571.

RIMLINGER, G. V. 1971. *Welfare policy and industrialization in Europe, America and Russia*, Wiley New York.

RODGERS, G. B. 1979. Income and inequality as determinants of mortality: an international cross-section analysis. *Population studies,* 33**,** 343-351.

RODRÍGUEZ-POSE, A. & TSELIOS, V. 2009. EDUCATION AND INCOME INEQUALITY IN THE REGIONS OF THE EUROPEAN UNION*. *Journal of Regional Science,* 49**,** 411-437.

RODRIK, D. 2003. *In search of prosperity: Analytic narratives on economic growth*, Princeton University Press.

RØED, K. & WESTLIE, L. 2012. Unemployment insurance in welfare states: the impacts of soft duration constraints. *Journal of the European Economic Association,* 10**,** 518-554.

ROINE, J., VLACHOS, J. & WALDENSTRÖM, D. 2009. The long-run determinants of inequality: What can we learn from top income data? *Journal of Public Economics,* 93**,** 974-988.

ROMÁN, C., CONGREGADO, E. & MILLÁN, J. M. 2013. Start-up incentives: entrepreneurship policy or active labour market programme? *Journal of Business Venturing,* 28**,** 151-175.

ROSEN, H. S. 2004. Public finance. *The Encyclopedia of Public Choice.* Springer.

ROSS, F. 2000. 'Beyond Left and Right': The New Partisan Politics of Welfare. *Governance,* 13**,** 155-183.

ROWLINGSON, K. 2011. Does income inequality cause health and social problems?

RUDRA, N. 2002. Globalization and the decline of the welfare state in less-developed countries. *International Organization,* 56**,** 411-445.

RUDRA, N. 2004. Openness, Welfare spending, and Inequality in the Developing world. *International Studies Quarterly,* 48**,** 683-709.

RUDRA, N. 2007. Welfare states in developing countries: unique or universal? *Journal of Politics,* 69**,** 378-396.

SAINT-PAUL, G. & VERDIER, T. 1993. Education, democracy and growth. *Journal of*

development Economics, 42**,** 399-407.

SCARPETTA, S. 1996. Assessing the role of labour market policies and institutional settings on unemployment: A cross-country study. *OECD Economic studies,* 26**,** 43-98.

SCHMIDT, M. G. 1996. When parties matter: A review of the possibilities and limits of partisan influence on public policy. *European Journal of Political Research,* 30**,** 155-183.

SCHULTZ, T. W. 1963. *The economic value of education*, Columbia University Press New York.

SCHWARZE, J. & HÄRPFER, M. 2003. Are people inequality averse, and do they prefer redistribution by the state? A revised version.

SCRUGGS, L. & ALLAN, J. 2006. Welfare-state decommodification in 18 OECD countries: a replication and revision. *Journal of European Social Policy,* 16**,** 55-72.

SCRUGGS, L. A. & ALLAN, J. P. 2008. Social Stratification and Welfare Regimes for the Twenty-first Century. *World Politics,* 60**,** 642-64.

SCRUGGS, L & JAHN, D & KUITTO, K. 2014. "Comparative Welfare Entitlements Dataset 2. Version 2014-03." University of Connecticut & University of Greifswald. Accessed frequently during 2013-15 at http://cwed2.org/

SCULLY, G. W. 2003. Optimal taxation, economic growth and income inequality. *Public Choice,* 115**,** 299-312.

SENIK, C. 2005. Income distribution and well-being: what can we learn from subjective data? *Journal of Economic Surveys,* 19**,** 43-63.

SHALEV, M. 2007. Limits and alternatives to multiple regression in comparative research. *Comparative Social Research,* 24**,** 261-308.

SHIN, I. 2012. Income inequality and economic growth. *Economic modelling,* 29**,** 2049-2057.

SIEGEL, N. A. 2002. *Baustelle Sozialpolitik: Konsolidierung und Rückbau im internationalen Vergleich*, Campus Verlag.

SIEGEL, N. A. 2007. When (only) money matters: The pros and cons of expenditure analysis. *Clasen, Jochen/Siegel, Nico A*, 43-71.

SMOLENSKY, E., PLOTNICK, R., EVENHOUSE, E. & REILLY, S. 1994. Growth, inequality, and poverty: A cautionary note. *Review of Income and Wealth,* 40**,** 217-222.

SNIJDERS, T. A. & BOSKER, R. J. 2012. Multilevel analysis. JSTOR.

SOL, E. & WESTERVELD, M. 2005. *Contractualism in employment services: a new form of welfare state governance*, Kluwer Law International.

SØRENSEN, A. 2006. Welfare states, family inequality, and equality of opportunity. *Research in Social Stratification and Mobility,* 24**,** 367-375.

STAFF, O. P. 2009. *Pensions at a Glance 2009: Retirement-Income Systems in OECD Countries*, OECD.

STARKE, P., OBINGER, H. & CASTLES, F. G. 2008. Convergence towards where: in what ways, if any, are welfare states becoming more similar? *Journal of European Public Policy,* 15**,** 975-1000.

STEGMUELLER, D. 2013. How many countries for multilevel modeling? A comparison of frequentist and Bayesian approaches. *American Journal of Political Science,* 57**,** 748-761.

STIGLITZ, J. E. 2012. *The price of inequality: How today's divided society endangers our future*, WW Norton & Company.

STOCK, J. H. & WATSON, M. W. 2003. *Introduction to econometrics*, Addison Wesley Boston.

STREECK, W. & THELEN, K. A. 2005. *Beyond continuity: Institutional change in advanced political economies*, Oxford University Press.

SUBRAMANIAN, S. & KAWACHI, I. 2004. Income inequality and health: what have we learned so far? *Epidemiologic Reviews,* 26**,** 78-91.

SUMNER, L. W. 1996. *Welfare, happiness, and ethics*, Clarendon Press.

SWENSON, P. 2002. *Capitalists against markets: The making of labor markets and welfare states in the United States and Sweden*, Oxford University Press on Demand.

SYLWESTER, K. 2000. Income inequality, education expenditures, and growth. *Journal of Development Economics,* 63**,** 379-398.

SYLWESTER, K. 2002. Can education expenditures reduce income inequality?

Economics of education review, 21**,** 43-52.

TANZI, V. & SCHUKNECHT, L. 2000. *Public spending in the 20th century: A global perspective*, Cambridge University Press.

TE VELDE, D. W. 2003. Foreign direct investment and income inequality in Latin America: Experiences and policy implications. *Foreign Direct Investment; Income Inequality and Poverty***,** 16.

TEULING, C. & VAN RENS, T. 2003. Education, Growth and Income Inequality. Economic Working Paper, Universitat Pompeu Fabra.

TEULINGS, C. & VAN RENS, T. 2008. Education, growth, and income inequality. *The review of economics and statistics,* 90**,** 89-104.

THELEN, K. 2004. *How institutions evolve: The political economy of skills in Germany, Britain, the United States, and Japan*, Cambridge University Press.

TITMUSS, R. M. 1965. Role of Redistribution in Social Policy, The. *Soc. Sec. Bull.,* 28**,** 14.

TITMUSS, R. M., ABEL-SMITH, B. & TITMUSS, K. 1974. *Social policy*, Allen & Unwin London.

TSEBELIS, G. 2002. *Veto players: How political institutions work*, Princeton University Press.

TULLOCK, G. 1983. General Welfare or Welfare for the Poor Only. *Economics of Income Redistribution.* Springer.

TULLOCK, G. 1997. *Economics of income redistribution*, Kluwer Academic Publishers Boston.

VAALAVUO, M. 2013. The redistributive impact of 'Old'and 'New'social spending. *Journal of Social Policy,* 42**,** 513-539.

VAGERÖ, D. & LUNDBERG, O. 1989. Health inequalities in Britain and Sweden. *The Lancet,* 334**,** 35-36.

VAN DE STADT, H., KAPTEYN, A. & VAN DE GEER, S. 1985. The relativity of utility: Evidence from panel data. *The review of Economics and Statistics***,** 179-187.

VAN DEN BERG, G. J., VAN DER KLAAUW, B. & VAN OURS, J. C. 2004. Punitive sanctions and the transition rate from welfare to work. *Journal of Labor Economics,* 22**,** 211-241.

VAN DEN BERG, G. J., VAN DER KLAAUW, B. & VAN OURS, J. C. 2004. Punitive sanctions and the transition rate from welfare to work. *Journal of Labor Economics,* 22**,** 211-241.

VAN DER GAAG, N. & BEER, J. 2015. From demographic dividend to demographic burden: the impact of population ageing on economic growth in Europe. *Tijdschrift voor economische en sociale geografie,* 106**,** 94-109.

VAN KERSBERGEN, K. and VIS, B., 2014. *Comparative welfare state politics.* Cambridge University Press.

VAN KERSBERGEN, K. & HEMERIJCK, A. 2012. Two decades of change in Europe: the emergence of the social investment state. *Journal of Social Policy,* 41**,** 475-492.

VAN KERSBERGEN, K. & KREMER, M. 2008. Conservatism and the welfare state: intervening to preserve. *Wim van Oorschot, Michael Opielka, and Birgit Pfau-Effinger, Culture and Welfare State. Values and Social Policy in Comparative Perspective, Cheltenham, UK, and Northampton, MA, Edward Elgar***,** 71-88.

VAN KERSBERGEN, K. & MANOW, P. 2009. *Religion, class coalitions, and welfare states*, Cambridge University Press.

VAN OORSCHOT, W. 2002. Targeting welfare: On the functions and dysfunctions of means testing in social policy. *World Poverty: New Policies to Defeat an Old Enemy. The Policy Press, Bristol.*

VAN OORSCHOT, W. & KOMTER, A. 1998. What is it that ties..? Theoretical perspectives on social bonds. *Sociale Wetenschappen,* 41**,** 4-24.

VAN VLIET, O., BEEN, J., CAMINADA, K. & GOUDSWAARD, K. 2012. Pension reform and income inequality among older people in 15 European countries. *International Journal of Social Welfare,* 21**,** S8-S29.

VAN VLIET, O. & WANG, C. 2015. Social investment and poverty reduction: A comparative analysis across fifteen European countries. *Journal of Social Policy,* 44**,** 611-638.

VANDENBROUCKE, F. & VLEMINCKX, K. 2011. Disappointing poverty trends: is the social investment state to blame? *Journal of European Social Policy,* 21**,** 450-471.

VANHOUDT, P. 1997. Do Labor Market Policies and Growth Fundamentals Matter for Income Inequality in OECD Countries?: Some Empirical Evidence. *Staff Papers,* 44**,** 356-373.

VIS, B., VAN KERSBERGEN, K. & HYLANDS, T. 2011. To what extent did the financial crisis intensify the pressure to reform the welfare state? *Social Policy & Administration,* 45**,** 338-353.

WEEDE, E. 1980. Beyond misspecification in sociological analyses of income inequality. *American Sociological Review***,** 497-501.

WEEDE, E. 1997. Income inequality, democracy and growth reconsidered. *European Journal of Political Economy,* 13**,** 751-764.

WELLS, R. 2004. US House backs court cash balance pension plan decision. *Dow Jones International News,* 22.

WENZELBURGER, G., ZOHLNHÖFER, R. & WOLF, F. 2013. Implications of dataset choice in comparative welfare state research. *Journal of European Public Policy,* 20**,** 1229-1250.

WILENSKY, H. L. 1975. The welfare state and equality: structural and ideological roots of public expenditure. JSTOR.

WILKINSON, R. G. & PICKETT, K. E. 2009. Income inequality and social dysfunction. *Annual Review of Sociology,* 35**,** 493-511.

WILSON, S. E. & BUTLER, D. M. 2007. A lot more to do: The sensitivity of time-series cross-section analyses to simple alternative specifications. *Political Analysis,* 15**,** 101-123.

WOOLDRIDGE, J. M. 2015. *Introductory econometrics: A modern approach*, Nelson Education.

ZAIDI, A. 2010. Fiscal and pension sustainability: Present and future issues in EU countries. *Policy Brief Series, the European Centre Vienna*.

ZHANG, J. 1996. Optimal public investments in education and endogenous growth. *The Scandinavian Journal of Economics***,** 387-404.

ZHONG, H. 2011. The impact of population aging on income inequality in developing countries: Evidence from rural China. *China Economic Review,* 22**,** 98-107.