# New Economic History of Yugoslavia, 1919 - 1939:

## Industrial Location, Market Integration and Financial Crises

Stefan Nikolić

Doctor of Philosophy

University of York

Economics

September, 2016

## Abstract

New Economic History of interwar Yugoslavia is uncharted territory. Combining historical data with modern econometrics the present thesis explores how economic development of Yugoslavia - a newly established and diverse country - was shaped by industrial location, market integration and financial crises. The results are relevant for the present as the least economically developed part of Europe today is comprised mostly of Yugoslav successor states.

What determined the location of industry in interwar Yugoslavia? Using panel data econometrics and a new dataset which covers eight Yugoslav regions and ten industries over a period of eight years industrial location is explained by a model in which Heckscher-Ohlin (HO), New Economic Geography (NEG) and Path Dependence theories are captured by interaction variables. Econometric results show that all three of the tested theories had a role to play. History matters in addition to HO and NEG type forces in determining the location of industry.

Were Yugoslav markets integrating during the interwar? If so, what were the drivers? Analysis of a novel panel data set of commodity prices observed over ten cities during the period from 1922 to 1939 shows that market integration increased during the interwar. City-pair commodity market integration is modeled using a set of trade cost. The progress of market integration during the interwar is explained by institutional and infrastructural advancements that reduced transaction and transport costs. Cultural differences did not impede market integration. Yugoslavia set out on a process of economic integration that was not hampered by its diversity.

Did Yugoslavia and six other East European countries experience financial crises during 1931? If so, what were the main contributing factors? Newly gathered high frequency data series on indicators of currency, banking and sovereign risk crises are explored using an analytical narrative. Worsening of economic fundamentals, drop in international credit and global demand, as well as international transmission led to financial crises in Eastern Europe in 1931. Completely avoiding financial crises was elusive but the most economically developed country was the least affected.

This pioneering New Economic History study of interwar Yugoslavia leads to a broad conclusion that present day economic backwardness and regional differences in economic development between Yugoslav successor states are not new and do not stem from a historical lack of market integration but can partly be explained by regionally uneven industrial development and a long history with financial crises.

# Contents

# List of Figures

# List of Tables

## Acknowledgements

Enormous gratitude goes out to my mentor Matthias Morys. His careful reading and Socratic questioning of my research have inspired me to improve the thesis with every new draft. Moreover, his continued support has enabled me to present ongoing research internationally and encouraged me to take the numerous challenges of writing a PhD thesis head on. Crucially, his teaching, research and all around human qualities have given me a model to look up to.

I would like to thank Giovanni Federico and Joan Rosés for the invested time in examining my thesis and a highly useful Viva examination. Their suggestions have allowed me to raise the quality of the final version of the thesis to a new level.

I am also grateful to the members of my Thesis Advisory Panel - Neil Rankin and Michael Thornton - for providing invaluable feedback on the economic and econometric aspects of my thesis and saving me from several potential pitfalls. Moreover, I thank all the members of the academic community, to whom I have had the privilege to present my research, for thought provoking discussions and comments. At certain points from 2013 to 2016, earlier versions of thesis chapters were present at the Fresh Workshop in Warsaw, WRDTC Economics Conference at the University of Sheffield, CHERRY and Economics Workshops at the University of York, 3rd Joint PhD Symposium on SEE at UCL, LSE EH590 Thesis Workshop, Belgrade WEast Workshop, EHES Summer School on Eastern Europe at Humboldt University, 9th SEEMHN Conference in Sofia, EHS' RTC in Manchester, EHES 'Beyond GDP' Summer School at the University of Groningen, the first two Interwar Economic History workshops at the LSE, 11th EHES Conference in Pisa, 10th SEEMHN Conference in Vienna, ESSHC Conference in Valencia and Prague Belgrade WEast Workshop. In addition, I would like to acknowledge the financial support from the University of York (Studentship of the Department of Economics and Travel Funding), Economic History Society (Bursary for PhD students) and the OSF (Global Supplementary Grant Program Award and Civil Society Scholar Award).

Finally, embarking on a quest to research economic history would not have been possible without the support from my family. Their belief in me has always motivated me to pursue

higher goals in life. My biggest gratitude goes to my soon to be wife Jelena for all the love, care and understanding she has provided over the years. She has been my lodestar in both good and bad times from day one. This thesis is dedicated to her.

## Author's declaration

I 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 in the Sources and Literature sections.

# 1 | Introducing New Economic History of Interwar Yugoslavia

Economic development – as the process of improvement of people's material and non-material wellbeing – is in the hearts of humanitarians, on the lips of politicians and in the minds of us all. The study of long-term comparative economic development as well as providing a historical perspective as to why some nations are prosperous while others are poor is the forte of economic historians. That history matters for present day economic development can be seen both as a cliché and an undeniable truth, but arguably some historical periods matter more than others.

The period between the end of the First World War and the beginning of the Second World War (henceforth the interwar) is particularly useful for the study of economic development for at least three reasons. First, the dissolution of various Empires following the end of the First World War led to several new developing economies appearing in Eastern Europe. Second, still overwhelmingly agricultural [Feinstein et al., 2008, pp. 54-55] these economies were yet to experience economic modernisation through gains from a structural shift in the economy and a higher division of labour – forces strongly at work in nineteenth century North-Western Europe. Naturally, developing economies had high hopes that these forces would diffuse to their market economies despite most of them having newly established borders. Third, de-globalisation and economic depression made industrialisation and market integration of developing economies during the interwar period all the more harder – benefits from international movements of products and factors were to be greatly reduced and financial crises were to severely retard economic development of Europe in general.

Out of all developing economies of the interwar period one stands out as particularly informative for present day economic development in Europe – interwar Yugoslavia.[1][2] This is because the least economically developed part of Europe today is comprised mostly of Yugoslav successor states. A quick glance at the current political map of Europe clearly shows that most

[1] Throughout the thesis we use the conventional term 'Yugoslavia' for the whole of the interwar period. We note that the Kingdom of Serbs, Croats and Slovenes, established in December 1918, officially changed its name to Kingdom of Yugoslavia in 1929.

[2] As a rule we deal with the problem of transliteration by using accepted English language translations (e.g. Yugoslavia or Belgrade) and original names in other cases (e.g. Ljubljana or Niš).

countries aspiring to join the European Union (EU) are Yugoslav successor states – Bosnia and Herzegovina, Former Yugoslav Republic of Macedonia (FYROM), Montenegro and Serbia. Interestingly, Slovenia and Croatia – two former Yugoslav republics – have managed to join the EU in in 2004 and 2013, respectively, not least because they were economically superior to the rest of former Yugoslavia according to available per capita GDP estimates [Bolt and van Zanden, 2013].

Just how backward and diverse are ex-Yugoslav economies compared to the rest of Europe? Levels of 2010 GDP per capita (expressed in 1990 international dollars) show that even deep into the Great Recession former Yugoslav states were lagging behind Western Europe (30 countries [Bolt and van Zanden, 2013]) but also Central Europe (Czechoslovakia, Hungary, Poland) – average GDP per capita of former Yugoslav states was 43 per cent of Western European and 83 per cent of average GDP of Central Europe. Looking at the coefficient of variation (CV) of 2010 GDP per person (expressed in 1990 international dollars) shows that mean incomes between Yugoslav successor states (Bosnia and Herzegovina, Croatia, FYROM, Montenegro, Serbia, Slovenia) differed more than those in the rest of Eastern Europe (Albania, Bulgaria, Czechoslovakia, Hungary, Poland, Romania) and Western Europe (30 countries [Bolt and van Zanden, 2013]) – the CV was respectively 0.51, 0.37, 0.18 for the first, second and third group of countries in 2010. Finally, it is revealing that the mean income of Slovenia was circa 3.3 times larger than that of Bosnia and Herzegovina (as of 2010 the richest and the poorest of the Yugoslav successor states respectively).

The four non-EU ex-Yugoslav countries see their commitment to further EU integration as a development mechanism allowing them to transform their institutions – for example their oversized public administration, inefficient judiciary system and fragile fiscal state. Ultimately EU membership is understood as a guarantee of sustained economic development resting, among other things, on access to a common market implying free movement of capital, commodities, and labour. However, large income disparities that prevail between Yugoslav successor states, their relative economic backwardness as well as possible enlargement fatigue of the EU towards low income countries may severely delay the accession of these countries

to the EU. Large differences within former Yugoslavia as well as its relative backwardness motivate a closer look into its economic history as a potential source of explanations for the present day economic under-development of this part of Europe. What can explain such diverse outcomes in economic development of present day independent countries that were part of Yugoslavia for more than seventy years? To acquire a historical perspective on this issue we investigate the economic development of Yugoslavia from its birth in December 1918 to the end of its first incarnation brought about by the Second World War.

## 1.1 Motivation

New Economic History of interwar Yugoslavia is uncharted territory. In contrast to recent quantitative research on interwar Greece [Christodoulakis, 2013], Bulgaria [Ivanov and Tooze, 2007, Tooze and Ivanov, 2011] or South-East Europe more broadly [Morys, 2013, Morys and Ivanov, 2015] being published in top economic history journals new economic history of Yugoslavia has not yet been discovered. This is not to say that qualitative economic history has not had its say on Yugoslav interwar economic history. Domestic pioneering authors such as Mijo Mirković or Nikola Vučo have produced several landmark works [Mirković, 1950, Vučo, 1968]. Cross-country research on the Balkans [Lampe and Jackson, 1982] and Eastern Europe [Aldcroft and Morewood, 1995, Berend and Ranki, 1974, Kaser and Radice, 1985, 1986a,b] included indispensable contributions on Yugoslavia. But from the end of Yugoslav civil wars in 1995 the interest in this county's economic history greatly diminished.[3] The political reasons behind the dismemberment of Yugoslavia became the topic du jour for many social scientists. It is only after one and a half decades of the transition period failed to bring most Yugoslav successor states considerably closer to Western European income levels that potential long-term causes of present day economic under-development of the region are being considered again. In fact the present PhD thesis is the first cliometric treatment of the economic history of interwar Yugoslavia ever to be written.

Given the practically empty canvas on the new economic history of interwar Yugoslavia

[3] Čalić [2004] was initially published as a PhD thesis in German in 1994.

there is much freedom on choosing a starting point. In three separate analytical chapters we document and explore industrial location, market integration and financial crises in interwar Yugoslavia. There are three reasons for starting with these topics. First, they were major forces that shaped economic development of interwar Yugoslavia. Namely, in most Yugoslav territories, industry was only beginning to be established during the interwar as in 1921 around eighty per cent of the workforce was still employed in the primary sector [Kraljevina Jugoslavija, 1940, p. VII]. Interwar Yugoslavia was part of a broader set of countries that in the 1920s erected tariffs to protect industry from foreign competition [Feinstein et al., 2008, p. 33]. Since such policies impeded international trade the reduced access to foreign markets could have forced Yugoslavia to integrate its own economy in order to expand its domestic market in an effort to foster economic development through gains from a more efficient division of labour as well as a larger consumer base. Yet both industrialisation and market integration were almost certainly severely set back by the watershed of the interwar period – the Great Depression. In turn, financial crises played a key role in deepening and internationalising the economic downturn [Eichengreen, 1992, Kindleberger, 1986] which makes it highly unlikely that Yugoslavia was bypassed by this financial turmoil.

Second, industrial location, market integration and financial crises are of interest to modern economic history as evidenced by recent research. Industrial development is increasingly studied as a sub-national phenomenon – precisely the way Pollard [1981] understood the process of industrialisation. Recently a series of empirical studies has mapped the location of industry within countries and analysed its determinants [Crafts and Mulatu, 2005, 2006, Crafts and Wolf, 2014, Klein and Crafts, 2012, Martínez-Galarraga, 2012, Wolf, 2007a]. While findings on the drivers of industrial location vary across time and space, a common feature is that industry is not found to be evenly dispersed across a given country but rather concentrated at certain locations. Thus different economic structures within national economies may explain varying outcomes in sub-national economic development. A separate group of articles has investigated market integration within a given economy using commodity price dispersion as a proxy [Federico, 2012]. The findings consistently show that changes in transportation

costs matter for market integration, but other forces such as ethnic diversity may also play a role [Schulze and Wolf, 2012]. Finally, a set of articles gave financial crises in Europe during the Great Depression their much overdue attention. These country case studies look to explain the causes of financial crises in 1931 by considering both domestic and international factors [Accominotti, 2012, Ritschl and Sarferaz, 2014]. Results suggest that financial crises in 1931 were not isolated events but because of international trade and banking linkages they had international ramifications. While the described research almost exclusively deals with more developed Western economies it paves the way towards considering the case of interwar Yugoslavia by providing an established empirical framework.

Third, the coming together of vastly different territories under one common border makes interwar Yugoslavia particularly well suited for studying the determinants of industrial location and market integration. The available data allows for a more disaggregated view of potential drivers of industrial location across Yugoslav regions than in the case of Poland [Wolf, 2007a] (8 vs 5 regions) despite the latter country occupying the largest area in Eastern Europe (excluding Soviet Russia). In turn, there was extensive variation in these drivers. For example, the North-West part of the country (Slovenia) had 95 per cent literacy rates opposed to only one third of the population in the South-East (South Serbia) being literate [Kraljevina Jugoslavija, 1938b]. Also, owing to its mixed heritage from the Austro-Hungarian and Ottoman Empires, Yugoslav regions greatly differed in the amount of inherited industry that survived the First World War [Ministarstvo trgovine i industrije, 1941]. Such regional variation in factors potentially attracting industry facilitates the identification of the determinants of industrial location in econometric analysis. The identification strategy of the effect of market potential on industrial location is aided by the exogenous variation in the access to markets faced by territories comprising Yugoslavia after the First World War coming from the changing of borders.

At its birth Yugoslavia was a uniquely heterogeneous country with two alphabets, three main religions, four railway systems, five tax systems as well as five currencies in circulation, and six customs areas (see [Narodna Banka Kraljevine Jugoslavije, 1935, p. 142], [Ministarstvo

finansija, 1939, pp. 43-45] and [Lampe, 1980, p. 139]).[4] At the onset of the interwar period expectations of increasing market integration in Yugoslavia were thus higher than in other countries. Its nascent diversity in fiscal, monetary and transport systems provides us with an opportunity to study the effects of institutional integration on market integration. Its unique religious structure - two Christian religions (Christian-Orthodox and Roman-Catholic) mixed with the largest Muslim population in Eastern Europe (including the whole Albanian state and excluding Turkey) - allows us to study whether ethno-religious differences would impede market integration through imposing an additional cost to domestic trade. Finally, the way in which Yugoslavia was created - to the liking of the 'international community' or its own political leaders [Mitrović, 2003] - and its ethnic, religious and political heterogeneity have produced a debate in political history [Lampe, 2000, pp. 4-8] on the inevitability of its eventual break-up. Research on how well markets have integrated during the interwar can bring in a missing economic history perspective on the discussion on the long-term viability of the Yugoslav state [Lampe, 2000].

Studying financial crises differs from industrial location or market integration as the former are relatively short lived phenomena while the latter are protracted processes. This is why our analysis of financial crises mostly concerns a single yet tremendously important year within the interwar – 1931. Moreover, to fully understand the potential gravity of financial crises in 1931 there is a need to branch out and also study other countries in addition to interwar Yugoslavia. If more advanced economies such as Austria and Germany, as well as developing economies such as Hungary could experience financial crises in 1931 [Eichengreen, 1992] then practically the whole of Eastern Europe that had a market economy was potentially susceptible to financial crises as suspected by Eichengreen [2011, pp. 36-37]. Therefore, in addition to Yugoslavia we analyse all developing economies that are feasible for such a study. Namely, our sample consists of Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia, while data limitations do not allow us to consider the small countries of the

[4] In relative terms, in 1921 [Kraljevina Jugoslavija, 1932] followers of the Christian-Orthodox, Roman-Catholic and Islamic faiths accounted for around 47, 40 and 11 per cent of all believers in Yugoslavia, respectively.

Baltics and Albania.

During the recent global financial crisis most of these countries and their successor states have fallen on hard times.[5] Slovenia and Croatia - the most advanced ex-Yugoslav economies and present day EU members – had no need for IMF or EU assistance programmes. However, all the other Yugoslav successor states (expect relatively tiny Montenegro) had drawn funds from the IMF during the course of the crisis. Foreign assistance was not confined to non-EU countries. Two of the largest South-East European economies – Greece and Romania – required balance-of-payments assistance programmes from supranational institutions since the start of the global financial crisis. While Romania advanced to precautionary arrangements post 2011 the situation in Greece is still recurrently making front page news. Moreover, the crisis was not exclusive to South-East Europe either. Hungary – a large Central European economy – received assistance from the European Community, the IMF and World Bank in approximately the same amount as Romania did. Therefore, the situation in 1931 may parallel the recent experience of Central-East and South-East European countries and reveal somewhat of a long term pattern of the occurrence of financial crises in the region.

## 1.2 Research questions and empirical frameworks

Industrial location, market integration and financial crises are broad topics that can be approached in many ways. What are the specific research questions and the empirical frameworks that will be used to address these questions in three main analytical chapters of the thesis?

In Chapter 2, we are interested in what determined the location of industrial activity within interwar Yugoslavia? Is it the comparative advantage in natural endowments and factors of production [Ohlin, 1933], forces of New Economic Geography (NEG) resting on the interaction of transportation costs, economies of scale and linkage effects [Krugman, 1991a] or Path Dependence operating through sunk costs that prohibit a relocation of industry [Crafts and Wolf, 2014]? We use panel data econometrics and a new data set which covers eight Yugoslav

[5] See `http://ec.europa.eu/economy_finance/assistance_eu_ms/index_en.htm` and `http://www.imf.org/external/np/fin/tad/exfin1.aspx` (last accessed 23 August 2016).

regions and ten industries over a period of eight interwar years to estimate a model based on Midelfart-Knarvik et al. [2000, 2001] that allows us to quantify and compare the predictive power of Heckscher-Ohlin, NEG and Path Dependence theories. The intuition behind the model is that regions have different characteristics and industries vary in the intensity of use of those characteristics. Hence the interplay of the two produces the main variables of interest that potentially explain the location of industry.

In Chapter 3, we ask whether Yugoslav markets were integrating in the first two decades after the end of the First World War? If so, which factors explain market integration in this newborn country? Our empirical framework follows a long tradition in studies on market integration and uses the coefficient of variation to measure market integration over time. The main advantage of using this statistical tool is that it is simple to compute, intuitive and easy to compare across time and space for a given set of goods [Federico, 2007, 2011]. However, we also aim to explain the drivers of market integration. For this purpose we rely on the empirical framework of Schulze and Wolf [2012]. The basic idea of the approach is to explain market integration with a set of trade costs which can be divided into those that are distance dependent (transport costs), network dependent (communication and community effects) and location-specific. This setup allows the use of panel data econometrics in order to estimate the relationship between market integration and a set of variables used to approximate trade costs. For the purpose of our analysis of price dispersion across Yugoslavia we compiled a new data set of commodity prices observed over a set of ten cities during the period from 1922 to 1939.

In Chapter 4, we want to know did Eastern European countries experience financial crises during 1931? If so, what were the main factors contributing to these crises? The nature of the task at hand – exploring financial crises in a short time horizon – does not facilitate the use of sophisticated econometric techniques. Nevertheless, processing a considerable amount newly gathered high frequency cross-country data series was necessary to come up with quantitative indicators of currency, banking and sovereign risk crises that are further explored through analytical narrative. In line with Eichengreen [1992, p. 262] central bank foreign reserves are investigated in order to gauge potential pressures on exchange rates. Series

on commercial bank deposits as well as complimentary qualitative evidence as in Bernanke and James [1991] and Grossman [1994] is used in exposing banking crises. Finally, the current yield on long-term sovereign bonds – a well established metric in the field [Obstfeld and Taylor, 2003] – is calculated as an indicator of sovereign risk crises.

## 1.3 Data set

For the main research questions of the present thesis to be answered a large amount of new data needed to be collected. Practically two new data sets were created - one international and one Yugoslav specific - both drawing on interwar source materials. The international data set is used in chapter 4. It is compiled from international data sources: regular [League of Nations, 1926-1944, LoN, various] and occasional [League of Nations, 1934a, 1935] publications of the League of Nations, issues of the Statistisches Reichsamt [Statistisches Reichsamt, 1936, 1937], international periodicals [The Economist, 1931, The Financial Times, 1931] and stock market bulletins [The London Stock Exchange, 1929]. The value added of this data set is its high frequency. Comprised of monthly data on commercial bank deposits as well as weekly data on values of central bank gold an foreign exchange reserves, central bank cover ratios, sovereign bond prices and sovereign bond yields it offers a systematic overview of the main financial indicators for seven Eastern European countries during a crucial part of the Great Depression. However, given the nature of our research question it is mainly limited to 1931.

The Yugoslav specific data set is used in chapters 2 and 3, and is comprised entirely from domestic data sources. Spanning over a number of categories (demographics, employment, finance, income, industry, prices and transport) this data set offers 22 different annual data series most of which have a panel structure. The data categories, series, dimensions and sources are summarised in table 1.1. Three aspects of the data set should be highlighted.

First, the data set is multidimensional. Most data series are available for multiple interwar years. Only data coming from population or industrial censuses is available for certain benchmark years. Almost all data series are available at a regionally disaggregated level. Whenever possible, data series were collected or aggregated to eight large administrative regions (LAR) - Bosnia & Herzegovina, Croatia & Slavonia, Dalmatia, Montenegro, South

**Table 1.1:** *Novel data set on interwar Yugoslavia*

| Data category | Data series | Data dimensions | | | Data sources |
|---|---|---|---|---|---|
| | | Time | Regional | Other | |
| Demographics | literacy | 1931 | 8 LAR[1], 378 districts | | a) |
| | mother tongue | 1921 | 8 LAR | 15 language categories | b) |
| | population | 1921 | 8 LAR | | b) |
| | | 1931 | 8 LAR, 378 districts | | c) |
| | religious affiliation | 1921 | 8 LAR, 10 cities | 8 religious categories | b) |
| | | 1931 | 8 LAR, 10 cities | 6 religious categories | d) |
| Employment | active population | 1931 | 8 LAR, 378 districts | main economic sectors, gender | e) |
| | insured workers | 1924-1931 | 8 LAR, 24 regional offices | | f) |
| | insured workers | 1932-1939 | 8 LAR, 17 regional offices | 28 economic sub-sectors | f) |
| Finance | central bank credit | 1920-1939 | 8 LAR, 22 regional offices | | g), h) |
| Income | secured wages | 1924-1931 | 8 LAR, 24 regional offices | | f) |
| | | 1932-1939 | 8 LAR, 17 regional offices | gender | f) |
| | unskilled labour wages | 1926-1939 | 10 cities | 4 occupations | i) |
| | earnings | 1930-1939 | | 21 economic sub-sectors | j) |
| Industry | approved patents | 1921-1939 | 8 LAR, place of residence[2] | | k) |
| | flow of capital | 1858-1938 | 8 LAR | 12 industries | l) |
| | flow of factories | 1858-1938 | 8 LAR | 12 industries | l) |
| | flow of horse power | 1858-1938 | 8 LAR | 12 industries | l) |
| | flow of workplaces | 1858-1938 | 8 LAR | 12 industries | l) |
| | production | 1938 | | 12 industries | l) |
| | use of energy | 1939 | | 11 industries | m) |
| Prices | retail prices | 1926-1939 | 10 cities | 21 goods | i) |
| | retail & wholesale prices | 1922-1928 | 10 cities | 37 goods | n) |
| | wholesale price index | 1926-1939 | | 6 product groups | i), o) |
| Transport | railway distances | 1925-1937 | 45 city-pairs | | p) |
| | transport costs | 1925-1938 | 45 city-pairs | | q) |

*Notes:* [1] LAR - Large administrative regions. See text for explanations. [2] Place of residence of patent inventor. *Sources:* See next page.

*Sources:* a) [Kraljevina Jugoslavija, 1938b]; b) [Kraljevina Jugoslavija, 1932]; c) [Kraljevina Jugoslavija, 1938b]; d) [Kraljevina Jugoslavija, 1938a]; e) [Kraljevina Jugoslavija, 1940]; f) [Središni ured za osiguranje radnika, 1932-1941]; g) [Narodna Banka Kraljevine Jugoslavije, 1935]; h) [Naronda Banka Kraljevine Jugoslavije, 1933-1939]; i) [Kraljevina Jugoslavija, 1932-1941]; j) [Radnička komora za Hrvatsku i Slavoniju, 1929-1941]; k) [Uprava za zaštitu industrijske svojine, 1921-1941]; l) [Ministarstvo trgovine i industrije, 1941]; m) [Demokratska Federativna Jugoslavija, 1945]; n) [Ministarstvo poljoprivrede, 1924-1931]; o) [National Bank of the Kingdom of Yugoslavia, 1929-1938]; p) [Ministarstvo saobraćaja, 1925a, 1930, 1933a, 1935, 1937]; q) [Ministarstvo saobraćaja, 1925b, 1933b, 1938].

Serbia, North Serbia, Slovenia and Vojvodina (Banat, Bačka and Baranja). Nevertheless, the majority of data series are also available at a more regionally disaggregated level, sometimes even at a district level (e.g. literacy rates, population and active population). Apart from the time and regional dimensions most data series also have one other dimension (or two in the case of active population). Depending on the data series a disaggregated view along sectors, industries, occupations, goods, language, religion or gender is available.

Second, the data set is inter-temporally comparable within and beyond the interwar. The internal reorganisation of the country in 1929 to nine ahistorical governorships has introduced discontinuity to statistical documentation reporting data on a regional basis. Nevertheless, working with disaggregated data it was possible to reconstruct most series back to eight large administrative regions in order to have a regional representation which is comparable over time. Eight large administrative regions can be compared to Yugoslav successor states as follows: Slovenia, Bosnia & Herzegovina, and Montenegro, would correspond to the three present day countries of the same name; present day Croatia, resembles the sum of Croatia & Slavonia and Dalmatia; the sum of Vojvodina, North Serbia and South Serbia, can best be compared to present day Serbia and Former Yugoslav Republic of Macedonia (FYROM) taken together. In the same way eight large administrative regions can be compared with the six federal republics of Socialist Yugoslavia.

Third, the data set is complementary to data series for interwar Yugoslavia provided by Mitchell [2013]. Our series on population, active population, earnings, industrial production and wholesale price indices offer regional or other data dimensions unavailable in Mitchell

[2013]. Namely, our data set provides regional estimates of population and employment per main economic sectors; earning are available for a large number of economic sub-sectors; value of industrial production for twelve industries; and wholesale price indices per six product groups. To the best of our knowledge the other 17 data series in our data set are not contained in any data set on international historical statistics. This contribution was made possible by the extensive use of domestic source materials only available in local libraries and archives and written in the local language. Thus, for the most part, our data sources differ from those of [Mitchell, 2013] who relied on Yugoslav Statistical yearbooks, publications of the League of Nations and the International Labour Organisation for series on interwar Yugoslavia.[6]

Additional information on the main Yugoslav source materials is given in table 1.2. The main institutions producing statistical publications were the central statistical office, various government ministries and other government institutions as well as the central bank. The statistical office was centralised only in 1931 when it was placed under the auspices of the Ministry of Internal Affairs [Paskojević, 1937]. It is not surprising that its publications - including the statistical yearbooks - start only from 1932 on. Central bank quarterly bulletins - providing mainly data on the financial sector, but also wholesale price indices calculated by the central bank itself - also begin to get published relatively late, that is in 1929. These publications stand as rare examples of statistical publications written both in the local and a foreign language (French).

The main source for systematic data for the 1920s are statistical publications produced by various government ministries, directorates and offices. The ministries of Agriculture and Transportation as well as the Directorate for the protection of industrial property and Social Insurance Office are such examples. These institutions recorded statistical data in their respective area of competence and made them public on a regular or occasional basis through specialised publications starting between the end of the First World War and the mid-1920s. The statistical office was able to draw on data from these institutions either by

[6]It is unclear what was the source or method of calculation of the Yugoslav industrial production index for 1937-1939 (indexed to 1937) given in Mitchell [2013].

**Table 1.2:** *Overview of main Yugoslav statistical source materials used in the present thesis*

| Publishing Institution | Publication details | | | |
|---|---|---|---|---|
| | Title[1] | Date | Frequency | Multilingual |
| *Central statistical office* | | | | |
| General State Statistics[2] | Population census of 1921 | 1932 | decennial | Yes |
| | Population census of 1931 | 1937-1940 | decennial | Yes |
| | Statistical yearbooks | 1932-1940 | annual | Yes |
| State Statistical Office[3] | Industrial statistics for 1939 | 1945 | one off | No |
| *Government ministries*: | | | | |
| Ministry of Agriculture[4] | Farmland and Crop Yield | 1922-1933 | annual | No |
| Ministry of Commerce and Industry[5] | Industrial census of 1938 | 1941 | one off | No |
| Ministry of Transportation[6] | Railway distance tables | 1925-1937 | occasional | No |
| | Railway tariffs | 1925-1938 | occasional | No |
| *Other government institutions* | | | | |
| Chamber of Labour[7] (Croatia and Slavonia) | Index | 1929-1941 | quarterly | Occasionally |
| Directorate for the protection of industrial property[8] | Patent protection | 1921-1941 | monthly | No |
| Social Insurance Office[9] | Workers protection | 1919-1941 | monthly | No |
| *Central Bank* | | | | |
| National Bank of Yugoslavia[10] | Annual Reports | 1921-1940 | annual | No |
| | Quarterly bulletin | 1929-1938 | quarterly | Yes |
| | Semi-centennial | 1935 | one off | No |

*Notes:* [1] For full titles see the thesis bibliography where both the original titles and English translations are provided. [2] Opšta državna statistika. [3] Državni statistički ured. [4] Ministarstvo poljoporivrede. [5] Ministarstvo trgovine i industrije. [6] Ministarstvo saobraćaja. [7] Radnička komora za Hrvatsku i Slavoniju. [8] Uprava za zaštitu industrijske svojine. [9] Središnji ured za osiguranje radnika. [10] Narodna Banka Kraljevine Jugoslavije.

direct communication or by collecting them from the mentioned specialised publications. Thus the statistical yearbook for 1929 offers data for the preceding period as well. However, given the necessity to revert to aggregations in many cases the statistical yearbooks are better seen as snapshots rather than a complete picture of the available data for interwar Yugoslavia.

## 1.4 Thesis structure

The present PhD thesis consists of five chapters. The introductory chapter is followed by three main analytical chapters and a concluding chapter. In addition to the abstract and introduction to the entire thesis, the main analytical chapters all have a separate abstract and introduction. Chapter abstracts should help the reader to immediately identify the main focus, methods, findings and conclusions of the research. Chapter introductions provide a more detailed motivation, literature review and historical context of the specific topic to be studied than the introductory chapter. The body of each analytical chapter consists of documenting the explicandum and providing the explicans. Thus each analytical chapter can be read separately or in the order it appears in the thesis.

Chapter 2 contributes to our knowledge on the determinants of industrial location by testing the explanatory power of Path Dependence in addition to the predictions of Heckscher-Ohlin and New Economic Geography theories. Chapter 3 sheds new light on historical discussions on how viable Yugoslavia was in the long run given that it was a newborn regionally diverse country, and whether this diversity was an impediment to market integration. Chapter 4 fills in the gap in our knowledge on the experience of Eastern Europe with currency, banking and sovereign risk crises during the European Financial Crisis of 1931 and explores the factors that may have contributed to these crises. The concluding chapter provides a summary of the main research questions, methods and results of the thesis stressing the new knowledge that was distilled in the research process. Moreover, it discusses the broader implications of the results for present day issues. Finally it offers a view on new research avenues that await the future.

# 2 | Determinants of Industrial Location


## Abstract

What determines the location of industry? Using panel data econometrics and a new dataset on interwar Yugoslavia the predictions of three theories - Heckscher-Ohlin, New Economic Geography, and Path Dependence - are quantified and compared. Results show that all three theories mattered and that New Economic Geography forces played a dominant role. The consensus view that several theories can simultaneously explain the distribution of industrial activity is thus reinforced. The main novelty is that Path Dependence can affect the location of industry in addition to Heckscher-Ohlin and New Economic Geography forces.


## 2.1 Introduction

What determines the location of industrial activity within a country? Economic theory offers different views on why some locations may be more attractive than others. A proposition based on the extensive Neoclassical Heckscher-Ohlin theory (HO) is that industry will be attracted to locations with a comparative advantage in natural endowments and factors of production [Ohlin, 1933]. On the other hand, New Economic Geography models (NEG) stress the interaction of transportation costs with economies of scale and linkage effects in creating geographical concentration of industries [Krugman, 1991b, pp.484-487]. In addition to comparative advantage and NEG type forces, sunk costs may lead to industrial location being Path Dependent.[7]

In the last two decades there has been a broad range of empirical studies motivated by distinguishing between the relative merit of HO and NEG in explaining the location of economic activity. Most notably, Midelfart-Knarvik et al. [2000, 2001] developed a micro-founded econometrically testable model, for the purpose of studying the location of industry in the EU (1970-1997). What separates the model from its forerunners is the fact that the effect of a large number of variables capturing HO and NEG forces can be quantified and

[7] David [1985] originally developed the concept of Path Dependence in a study of diffusion and adoption of technology. North [1990, p.93] refers to this study as: 'The article that first called the attention of economic historians to the issue of path dependence...'. Note that the introduction of David [1975] already had traces of Path Dependence theory set out.

compared.[8] The model quickly diffused in the field of Economic History: Crafts and Mulatu [2005, 2006] analysed what determined the location of British industry (1871-1931) and also studied how the location of British industry before the First World War responded to falling transportation costs; Wolf [2007a] researched the relocation of industry in interwar Poland (1926-1934); Klein and Crafts [2012] accounted for the persistence of the 'Manufacturing Belt' in the US (1880-1920); and Martínez-Galarraga [2012] established the determinants of industrial location in Spain (1856–1929). There is a broad consensus in this literature that HO and NEG theories are not mutually exclusive, but can - and in most countries and time periods do - influence the location of industrial activity simultaneously. However, the statistical and economic significance of mechanisms behind these theories varies considerably according to context. Moreover, Crafts and Wolf [2014] recently used a different modeling approach and found strong evidence that Path Dependence - operating both through agglomeration benefits and sunk costs - helps explain the location of the UK cotton textiles industry in 1838. Thus an overall pattern of the actual drivers of industrial location across space and time is still not discernible. The present chapter is an additional piece of empirical evidence in solving the puzzle of industrial location determinants. What distinguishes the present research from its predecessors is that we test the explanatory power of HO, NEG *and* Path Dependence using a *panel* data set consisting of observations for multiple regions, industries and years.

The location of industry in interwar Yugoslavia is used as the testing ground as it provides evidence both for a region (South East Europe) and type of economy (late industrialising) on which research is in short supply. Moreover, empirical studies in New Economic Geography usually employ external shocks to identify the mechanisms behind the location of industry, economic activity in general or population [Redding, 2010]. Hence, from the perspective of New Economic Geography interwar Yugoslavia is particularly well suited for studying the determinants of industrial location as the changing of borders following the First World War

[8] See Brülhart [1998] for a review of the early empirical literature such as the pioneering work of Kim [1995, 1999]. Davis and Weinstein [1999, 2003] developed a model that nests both theories, but its main application is to differentiate between the two theories, rather than identify individual drivers of industrial location. Rosés [2003] uses a similar approach. Midelfart-Knarvik et al. [2000, p.65] note that their model is closest to that of Ellison and Glaeser [1999].

brought exogenous variation in the access to markets faced by new Yugoslav territories. Finally, Yugoslavia is an excellent example where taking a regional approach has broader merits, as it leads to the uncovering of vast regional differences which at the national level would be left unseen.

Chapter 2 is structured as follows. In the next section the optimal way to measure the location of industry in interwar Yugoslavia is discussed and the distribution of Yugoslav industry across space and time is explored. Section 2.3 provides the theoretical and empirical framework for subsequent econometric testing. In section 2.4 panel data econometrics is used to estimate the determinants of industrial location in interwar Yugoslavia. The last section summarizes and concludes.

## 2.2 Industrial location in interwar Yugoslavia

### 2.2.1. Measuring industrial location

In accordance with the policies of the International Labor Organization the Yugoslav constitution of 1921 guaranteed social security to workers. The 1922 Law on the Protection of Workers regulated employer-worker relations and entrusted the implementation of social insurance to the Central Office for the Insurance of Workers (*Središnji ured za osiguranje radnika*, henceforth SUZOR). In 1932 SUZOR started to report detailed data on the number of insured workers in its monthly journal called Protection of Workers [Središni ured za osiguranje radnika, 1932-1941].[9] This publication is the best available source for the measurement of industrial location across interwar Yugoslavia as it reported regionally disaggregated cross-sections on the number of state and privately insured workers across a wide range of economic activities for the period 1932-1939.[10]

SUZOR had 17 regional offices insuring workers in as many different regions. SUZOR data have been aggregated to the 1921 administrative division of Yugoslavia into eight regions -

[9] In total 28 sub-sectors of industry and services were covered in the publication. Agriculture and mining were for the most part left out.

[10] The 1921 census of population does not provide industrial employment data. The 1931 census of population does not provide regionally disaggregated data on the industrial dimension. The only census of Yugoslav interwar industry, taken in 1938 [Ministarstvo trgovine i industrije, 1941], has a regional representation of the data according to *Banovine* - governorships introduced in 1929 which do not allow a meaningful comparison to any other previous or subsequent period.

Slovenia, Croatia-Slavonia, Vojvodina, North Serbia, Bosnia-Herzegovina, Dalmatia, South Serbia, and Montenegro (see Map 2.1).[11] The fit of SUZOR regional offices to administrative regions is shown in Map 2.2. For SUZOR regions spanning across several administrative regions (e.g. Dubrovnik) corrections were necessary before aggregation.[12]

In addition to SUZOR regional offices there were three large private insurance companies located in the most populous cities of Yugoslavia (Belgrade, Ljubljana, and Zagreb). Compared to state provided insurance private companies played only a minor role as they accounted for less than three percent of total insured industrial workers in any year from 1932 to 1939 [Središni ured za osiguranje radnika, 1932-1941]. Workers insured by private companies were added to the corresponding SUZOR regional office (i.e. Belgrade, Ljubljana or Zagreb).

The industrial dimension consists of ten industrial categories: chemicals; electric power and water supply; food and beverage; leather and rubber (including rubber manufactures); metals and machinery; paper and printing; stone and earth; textiles; tobacco; and wood (including wood manufactures). The aggregation on the industrial dimension was straightforward - it amounted to summing the number of insured industrial workers in the following industries: wood with wood manufactures, paper with printing, and finally leather and rubber with rubber manufactures.[13]

[11] Administrative regions can roughly be compared to present day countries. Slovenia, Bosnia-Herzegovina and Montenegro mostly correspond to the three present day countries of the same name. Present day Croatia resembles the sum of Croatia-Slavonia and Dalmatia. The sum of Vojvodina, North Serbia and South Serbia is best compared to present day Serbia and Former Yugoslav Republic of Macedonia (FYROM) taken together.

[12] Municipal level industrial employment weights (only available from the 1931 Census of Population) were applied to affected SUZOR regions in order to get at municipal level industrial employment values. The values were then re-assigned to the correct administrative regions. The magnitude of the correction was minor - the adjustment was done for 34 out of 344 municipalities total covering circa 6% of total industrial employment in 1931.

[13] The aggregation was done so as to maximize the comparability between the dependent and explanatory variables in later econometric testing.

**Map 2.1:** *Map of Yugoslavia according to 1921 administrative regions*


Notes: The eight administrative regions were: Bosnia-Herzegovina, Croatia-Slavonia, Dalmatia, Montenegro, South Serbia, North Serbia, Slovenia and Vojvodina.
Sources: own GIS map of mainland Yugoslavia based on map from [Kraljevina Jugoslavija, 1932].

**Map 2.2:** *Map of Yugoslavia showing the fit of SUZOR regional offices to 1921 administrative regions*


Notes: The 17 SUZOR regional offices were: Banja Luka, Belgrade, Dubrovnik, Karlovac, Ljubljana, Niš, Novi Sad, Osijek, Petrovgrad, Sarajevo, Skopje, Sombor, Split, Subotica, Sušak, Tuzla, Zagreb.
Sources: own GIS map based on [Središni ured za osiguranje radnika, 1932-1941] and Map 2.1.

**Table 2.1:** *Cross-check of SUZOR data on insured industrial workers with Industrial Census data on industrial employees (1938 benchmark)*

| Data source | SUZOR | | Industrial Census | |
|---|---|---|---|---|
| Region[a] | No. | % | No. | % |
| Bosnia-Herzegovina | 41 560 | 12.31 | 31 158 | 10.36 |
| Croatia-Slavonia | 97 258 | 28.80 | 86 180 | 28.67 |
| Dalmatia | 10 424 | 3.09 | 11 356 | 3.78 |
| Montenegro | 2167 | 0.64 | 292 | 0.10 |
| North Serbia | 61 475 | 18.21 | 55 025 | 18.30 |
| South Serbia | 16 315 | 4.83 | 3724 | 1.24 |
| Slovenia | 60 998 | 18.06 | 64 472 | 21.45 |
| Vojvodina | 47 476 | 14.06 | 48 406 | 16.10 |
| Yugoslavia | 337 673 | 100 | 300 613 | 100 |

*Sources:* Own calculations based on SUZOR data [Središni ured za osiguranje radnika, 1932-1941] and Industrial Census data [Ministarstvo trgovine i industrije, 1941].
*Notes:* [a]SUZOR data aggregated to historical regions reported in the 1921 Census of Population (e.g. Croatia-Slavonia include the region *Srem*; Vojvodina consists of *Banat, Bačka and Baranja*). Industrial Census for 1938 presents the data with the above regional division (note that the source uses the term Serbia 1912 instead of North Serbia).

How does SUZOR data compare to other sources of employment data? Census of population for 1931 [Kraljevina Jugoslavija, 1940] provides data on active population but makes no attempt to distinguish between industry and crafts. SUZOR data is more representative of true industrial employment as factory workers were more likely to be insured than artisans. In fact, SUZOR data for 1932 covers a third of workers in industry and crafts in 1931.[14] Industrial Census for 1938 [Ministarstvo trgovine i industrije, 1941] provides data on the regional distribution of workers employed in industry. Table 2.1 cross-checks the regional distribution of insured and employed industrial workers in 1938. The correlation between the two series is around 98 percent which is strong evidence that data on insured industrial workers are representative of employed industrial workers.[15] Hereafter, the terms 'insured

[14]In turn, industry and crafts accounted for circa eleven percent of total active population in 1931 [Kraljevina Jugoslavija, 1940].

[15]There was a lack of clarity in the survey question on employment in the industrial census. Establishments were to report the number of employees needed to operate 'uninterruptedly' and 'under full production capacity'. The assumed amount of working hours however was not specified. Establishments that assumed a working day of 8 hours would report a smaller number of employees than those that assumed a longer working day [Ministarstvo trgovine i industrije, 1941, p. 10]. For this reason the total number of insured industrial workers

industrial workers', 'industrial employment' and 'industrial activity' are used interchangeably.

### 2.2.2. Exploring industrial location

Table 2.2 shows the distribution of insured industrial workers across industries and regions as an 1932-1939 average (expressed in percentages). Because regions differed greatly in terms of population (see the bottom row of table 2.2) the data shown is population weighted. The eight regions of Yugoslavia are ordered according to their share in Yugoslav industrial employment which is shown in the penultimate row of table 2.2. The most industrial region was Slovenia accounting for almost 30 percent of total industrial activity in Yugoslavia. The North-West (Slovenia, Croatia-Slavonia, and Vojvodina) was the most industrial part of the country employing two-thirds of all industrial workers. The rest of industry was distributed across North Serbia, Bosnia-Herzegovina, Dalmatia, South Serbia, and Montenegro (in that order).

The ten industrial categories are ordered according to their share in total industrial employment reported in the second column of table 2.2. The wood industry was the largest industrial employer accounting for about a fifth of total industrial employment. The textile industry was in second place capturing approximately 18 percent. The top four industries accounted for two-thirds of total Yugoslav industrial activity. A third of industrial employment was distributed among the remaining six smaller industrial categories.

The regional distribution of each industry is shown in the first ten rows of table 2.2. More than half of each industry (except tobacco) was located in the North-West. In seven out of ten industrial categories Slovenia had the largest share, and in all cases (bar tobacco) the leader was from the North-West. Montenegro and South Serbia stand out with a relatively large share in the tobacco industry.

---

is larger than the number of employed industrial workers shown in table 2.1.

**Table 2.2:** *Distribution of insured industrial workers across industries and regions (population weighted, 1932-1939 average)*

| Region[a] | Yug | Slo | C-S | Voj | N.Ser. | B-H | Dal | S.Ser | Mne |
|---|---|---|---|---|---|---|---|---|---|
| Wood + Wood manufactures[b] | 21.09 | 28.19 | 23.48 | 15.51 | 3.57 | 21.10 | 3.72 | 2.44 | 1.98 |
| Textiles | 17.64 | 44.83 | 19.79 | 16.79 | 8.43 | 2.23 | 3.36 | 4.28 | 0.29 |
| Metals and machinery | 13.77 | 29.43 | 13.32 | 17.59 | 16.40 | 6.91 | 7.57 | 3.23 | 5.55 |
| Food and beverage | 13.26 | 16.49 | 18.64 | 25.21 | 9.92 | 6.54 | 12.91 | 5.51 | 4.78 |
| Stone and earth | 9.48 | 26.53 | 15.13 | 21.13 | 8.17 | 5.90 | 17.03 | 2.14 | 3.97 |
| Leather and rubber + Rubber manu.[b] | 8.37 | 33.55 | 20.51 | 15.33 | 12.17 | 6.23 | 5.98 | 4.40 | 1.83 |
| Tobacco | 5.68 | 9.80 | 2.90 | 8.53 | 7.27 | 14.75 | 15.45 | 17.12 | 24.18 |
| Paper + Printing[b] | 4.54 | 40.00 | 19.13 | 13.26 | 14.88 | 3.49 | 5.92 | 1.45 | 1.87 |
| Chemicals | 3.82 | 31.04 | 21.82 | 12.32 | 7.32 | 10.42 | 12.99 | 1.90 | 2.20 |
| Electric power and water supply | 2.36 | 14.27 | 22.24 | 19.01 | 15.75 | 6.19 | 15.19 | 3.53 | 3.81 |
| Total industry | 100 | 29.21 | 18.30 | 17.31 | 9.33 | 9.24 | 8.34 | 4.20 | 4.06 |
| Population shares | 100 | 8.21 | 21.77 | 10.21 | 23.83 | 16.68 | 4.9 | 12.79 | 1.61 |

*Sources:* Own calculations based on SUZOR data [Središni ured za osiguranje radnika, 1932-1941] and 1931 population census results [Kraljevina Jugoslavija, 1937].
*Notes:* [a]Region abbreviations: Slo = Slovenia; C-S = Croatia-Slavonia; Voj = Vojvodina; N.Ser = North Serbia; B-H = Bosnia-Herzegovina; Dal = Dalmatia; S.Ser. = South Serbia; Mne = Montenegro. [b]The plus sign (+) indicates which industries have been aggregated. The aggregation was done conditional on the data available for industrial intensities needed in order to perform our econometric analysis in Section 2.4.

## 2.3 Explaining industrial location

### 2.3.1. Theoretical framework

Three different economic theories may help explain what determined the location of industrial activity within interwar Yugoslavia. The Neoclassical Heckscher-Ohlin theory [Ohlin, 1933] assumes zero transport costs, perfect competition, and non-increasing returns to scale. The theory predicts that comparative advantage in natural endowments and factors of production (including technological differences) determines the location of economic activity. New Economic Geography [Krugman, 1991a] allows for the presence of transportation costs and intermediate goods, assumes monopolistic competition and increasing returns to scale. According to New Economic Geography theory industries will be inclined to locate closer to larger markets in order to minimize on transportation costs. Industry linkages with consumer and supplier markets (i.e. input-output relations) play a key role in determining industrial location Krugman and Venables [1995], Venables [1996].

Crucially, there is no necessary connection between increasing returns and path dependence [David, 2007, p. 102].[16] New Economic Geography and Path Dependence can work through different channels: '[f]irst, there can be positive feedback effects due to market access as highlighted in new economic geography models in the wake of Krugman [1991a]. Second, sunk costs can introduce another form of hysteresis in location choice that can delay relocation' [Crafts and Wolf, 2014, p. 1110]. In our framework increasing returns are part of New Economic Geography forces, while Path Dependence operates through sunk costs that prohibit a relocation of industry.[17]

[16] David [1985] originally developed the concept of Path Dependence in a study of diffusion and adoption of technology. North [1990, p.93] refers to this study as: 'The article that first called the attention of economic historians to the issue of path dependence...'. Note that the introduction of David [1975] already had traces of Path Dependence theory set out.

[17] David [1985, pp. 334-336] refers to sunk costs as quasi-irreversibility of investment. "Among the most readily recognizable irreversibilities are those associated with investment in durable assets, the cost of which are 'sunk'[...]" [David, 2007, p. 101].

### 2.3.2. Empirical framework

The model of Midelfart-Knarvik et al. [2000, 2001] allows the quantification and comparison of the predictive power of Heckscher-Ohlin, New Economic Geography, and Path Dependence theories. The intuition behind the model is that regions have different characteristics, and industries vary in the intensity of use of those characteristics. The interplay between regional and industrial characteristics produces the main variables of interest that potentially explain the location of industry.

Table 2.3 summarizes the variation in regional characteristics across eight Yugoslav regions, showing average values for our sample period (1932-1939).[18] The distribution of coal and wood - the two dominant energy sources used by Yugoslav industry [Demokratska Federativna Jugoslavija, 1945] - are captured by factor price data.[19] Yugoslavia was characterized by high inter-regional labor immobility. As much as 94 percent of people born on Yugoslav territories were living in their region of birth during the interwar [Kirk, 1969, p. 143]. Regional comparative advantage in unskilled and skilled labor endowments are proxied using wage data.[20] Wages of daily laborers capture the relative availability of unskilled labour. Wages of insured workers capture the relative availability of skilled labour. The regional distribution of capital is proxied by regional urbanization rates as housing can be considered the main component of capital stocks in this period [Rosés, 2003]. Market potential estimates capture regional differences in access to supplier and consumer markets. To understand the intuition behind the calculation of the measure consider that market potential of each region $i$ is comprised of a domestic and foreign counterpart. Domestic market potential of region $i$ will stem from the economic size of region $i$ itself, plus the economic size of other Yugoslav regions, corrected for the distance from region $i$. Foreign market potential of region $i$ will depend on the economic size of Yugoslavia's main trading partners corrected for trade tariffs and the distance from region $i$. Therefore, total market potential of a region would be the sum of

[18] See section 2.6 (Appendix A) for detailed calculation methods and sources used.

[19] The application of electricity for industrial purposes was limited. Yugoslav industry had little use for first nature [Krugman, 1993] endowments such as water power [Kukoleča, 1941, p.354].

[20] Sectoral labor share measures are potentially endogenous to the location of industrial employment.

**Table 2.3:** *Regional characteristics (1932-1939 average)*

| | Region[a] | | Slo | C-S | Voj | N.Ser. | B-H | Dal | S.Ser. | Mne | Yug avg |
|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Regional characteristic | Unit | | | | | | | | | |
| 1. | Coal availability | dinar per 10kg | 4.48 | 4.24 | 4.34 | 2.63 | 2.94 | 3.91 | 3.13 | 3.33 | 3.62 |
| 2. | Wood availability | dinar per $m^3$ | 92.81 | 104.25 | 126.08 | 117.37 | 74.39 | 119.31 | 120.26 | 83.75 | 104.78 |
| 3. | Unskilled labor wages | dinar per day | 33.60 | 25.81 | 22.53 | 22.84 | 19.28 | 29.82 | 16.05 | 22.96 | 24.11 |
| 4. | Skilled labour wages | insured dinar wage | 24 | 24.8 | 19.4 | 23.7 | 20.9 | 21.2 | 20.6 | 24.9 | 22.4 |
| 5. | Urbanization rate | % of region total | 9.9 | 14.1 | 25.4 | 9.6 | 7.6 | 17.3 | 8.7 | 9 | 12.7 |
| 6. | Market potential | m. 1990 int. usd | 2347 | 2270 | 1879 | 1816 | 1717 | 1968 | 1441 | 1640 | 1776 |
| 7. | Inherited industry ratio | % of factories[b] | 118.12 | 82.76 | 121.68 | 64.68 | 119.69 | 76.56 | 27.25 | 79.04 | 86.22 |

*Sources:* See section 2.6 (Appendix A).
*Notes:* [a]Region abbreviations as in Table 2.2. [b](No. of factories established pre-1918 in region $i$ / No. of factories established during interwar in region $i$) * 100.

its domestic and foreign market potential.[21] Finally, the inherited industry ratio measures the regional variation in the ratio of factories created before and after the establishment of Yugoslavia.

Economic Geography favored the North-West - Slovenia and Croatia-Slavonia had the highest market potential in Yugoslavia. North-Western regions had the advantage over other Yugoslav regions as they were closer to Yugoslav main foreign trading partners (Austria, Italy, Germany and Czechoslovakia). Labour wages were also the highest in the North-West. Central-Eastern regions (Bosnia-Herzegovina, North Serbia, and South Serbia) were abundant in energy sources. History favored the three North-West regions (Slovenia, Croatia-Slavonia and Vojvodina) which accounted for almost three quarters of total inherited factories [Ministarstvo trgovine i industrije, 1941].[22] The inherited industry ratio shows that the majority of industry in Slovenia, Vojvodina, and Bosnia-Herzegovina was established before the creation of Yugoslavia. Other regions established more factories during the interwar than before becoming part of Yugoslavia.

Table 2.4 reports the variation in industrial intensities across ten industrial categories.[23] The stone and earth industry was the most energy intensive industry. The use of coal energy prevailed over wood energy in all industries except the wood industry. In turn, the tobacco industry had the largest use for unskilled labor, while the most skilled labor intensive industry was electricity and water supply. The tobacco industry was the least capital intensive. The most capital intensive industry was stone and earth. Electric power and water supply was the industry most strongly linked by sales to other industries, while food and beverages sold the least to other industries. The chemical industry had the biggest use for industrial intermediates, while the wood industry consumed the least intermediate inputs.

Table 2.5 shows how Hecksher-Ohlin, New Economic Geography, and Path Dependence theories are captured through the interactions of regional characteristics and industrial intensi-

[21] See section 2.7 (Appendix B) for detailed calculation methods of market potential.

[22] Out of all the factories listed in the 1938 industrial census 45 percent were established before Yugoslavia came together [Ministarstvo trgovine i industrije, 1941].

[23] As common in the literature, industrial intensities are assumed to be time-invariant. See section 2.6 (Appendix A) for calculation methods and sources used.

**Table 2.4:** *Industrial intensities*

| | Industry[a] | | Wood | Tex | MM | FB | SE | LR | Tob | PP | Chem | EW | Ind avg |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| No. | Intensity | Unit | | | | | | | | | | | |
| 1. | Coal | din per 1000 din output | 0.83 | 10.16 | 27.46 | 17.73 | 101.38 | 6.15 | 33.71 | 16.10 | 16.59 | 16.05 | 24.61 |
| 2. | Wood | din per 1000 din output | 11.42 | 1.25 | 1.50 | 10.01 | 27.20 | 1.61 | 9.50 | 1.75 | 3.59 | 1.75 | 6.96 |
| 3. | Unskilled labor | % of industry total | 79.1 | 73.6 | 50.4 | 60.5 | 78.6 | 53.1 | 80.2 | 58.4 | 66.1 | 47.2 | 64.7 |
| 4. | Skilled labor | % of industry total | 20.9 | 26.4 | 49.6 | 39.5 | 21.4 | 46.9 | 19.8 | 41.6 | 33.9 | 52.8 | 35.3 |
| 5. | Capital | din per din output | 1.19 | 0.52 | 0.63 | 0.72 | 2.21 | 0.56 | 0.07 | 1.01 | 1.06 | 0.97 | 0.90 |
| 6. | Sales to ind. | % of sales to industry | 47.65 | 32.85 | 42.27 | 21.02 | 39.27 | 36.70 | 39.82 | 54.61 | 47.87 | 65.49 | 42.76 |
| 7. | Inputs from ind. | % of inputs from ind. | 15.11 | 36.90 | 56.02 | 31.78 | 42.19 | 34.72 | 25.53 | 46.43 | 60.45 | 25.70 | 37.48 |

*Sources:* See section 2.6 (Appendix A).
*Notes:* [a]Industry abbreviations: Wood = Wood + Wood manufactures; Tex = Textiles; MM = Metals and machinery; FB = Food and beverage; SE = Stone and earth; LR = Leather and rubber + Rubber manu.; Tob = Tobacco; PP = Paper + Printing; Chem = Chemicals; EW = Electric power and water supply; Ind avg = industry average.

**Table 2.5:** *Heckscher-Ohlin, New Economic Geography, and Path Dependence captured through interaction terms of regional characteristics and industrial intensities*

| Theory | No. | Interaction | | Regional characteristic | | Industrial intensity |
|---|---|---|---|---|---|---|
| I Heckscher-Ohlin | | | | | | |
| | 1. | Coal energy | = | Coal availability | * | Coal intensity |
| | 2. | Wood energy | = | Wood availability | * | Wood intensity |
| | 3. | Unskilled labor | = | Unskilled labor wages | * | Unskilled labor intensity |
| | 4. | Skilled labour | = | Skilled labour wages | * | Skilled labor intensity |
| | 5. | Capital | = | Urbanization rate | * | Capital intensity |
| II New Economic Geography | | | | | | |
| | 6. | Sale linkages | = | Market potential | * | Sales to industry |
| | 7. | Input linkages | = | Market potential | * | Inputs from industry |
| III Path Dependence | | | | | | |
| | 8. | Path dependence | = | Inherited industry ratio | * | Capital intensity |

ties.[24] Heckscher-Ohlin predictions are captured by the first five interactions. The two energy interactions are expected to be negatively related to industrial location - industries with a high use of coal and wood energy will be attracted to regions where these energy sources are cheap. Labor interactions can be both negatively or positively signed depending on whether labour intensive industries were looking for cheap labour associated with low wages (negative sign) or high human capital that was embedded in high wages (positive sign). New Economic Geography forces are captured by interacting market potential with either sales or input linkages. Both interactions are expected to have a positive sign as industries with stronger ties to industrial consumers or suppliers will tend to locate closer to larger markets. Path Dependence is controlled for by interacting the inherited industry ratio with capital intensity. A positive sign is expected as capital intensive industries with high sunk costs will tend to be located in regions with a high share of inherited industry.

## 2.4 Econometric analysis

### 2.4.1. Baseline estimation

The baseline econometric equation to be estimated can be written as:

$$lnLOCATION_{ik,t} = \alpha + \beta_n INTERACTION_{ik,t} + \gamma_m lnREGION_{i,t} + \delta_m INDUSTRY_k + \epsilon_{ik,t} \quad (1)$$

where $LOCATION_{ik,t}$ is the population weighted share of region $i$ ($i$=8) in the total industrial employment of industry $k$ ($k$=10) at time $t$ ($t$=8); $REGION_{i,t}$ is a set of $m$ ($m$=7) regional characteristics varying over regions and time; $INDUSTRY_k$ is a set of $m$ industrial intensities varying over industries only; $INTERACTION_{ik,t}$ is a set of $n$ ($n$=8) interaction variables varying over regions, industries, and time; $\alpha$ is a constant term and $\epsilon_{ik,t}$ an error term.[25]

Baseline econometric results are summarized in Table 2.6. The bottom part of Table 2.6 provides information on the inclusion of fixed effects, the number of observations and the

[24] See section 2.6 (Appendix A) for calculation methods and sources used for regional and industrial characteristics.

[25] The specification is based on Midelfart-Knarvik et al. [2001] and natural logarithms are taken accordingly.

**Table 2.6:** *Modeling Yugoslav industrial location 1932-1939: Pooled OLS estimations with three-way fixed effects*

| | Model 1 POLS | Model 2 POLS | Model 3 POLS | Model 4 POLS | Model 5 POLS |
|---|---|---|---|---|---|
| I Heckscher-Ohlin | | | | | |
| Unskilled Labour | -0.1133 | -0.1015 | 0.0143 | 0.2392 | 0.1535 |
| | (0.757) | (0.784) | (0.970) | (0.514) | (0.709) |
| Skilled Labour | 1.9573* | 1.9751** | 2.0369** | 1.6624** | 1.8372** |
| | (0.053) | (0.049) | (0.027) | (0.030) | (0.047) |
| Capital | | 0.0002 | 0.0001 | 0.0001 | 0.0001 |
| | | (0.710) | (0.811) | (0.893) | (0.815) |
| Coal Energy | | | -0.0008 | -0.0022 | -0.0053 |
| | | | (0.822) | (0.585) | (0.258) |
| Wood Energy | | | -0.0232 | -0.0189 | 0.0008 |
| | | | (0.381) | (0.421) | (0.977) |
| II NEG | | | | | |
| Sales linkages | | | | 2.4275 | 2.0372 |
| | | | | (0.170) | (0.198) |
| Input linkages | | | | 4.6671*** | 4.6020*** |
| | | | | (0.000) | (0.000) |
| III Path Dependence | | | | | |
| Path dependence | | | | | 0.4812*** |
| | | | | | (0.000) |
| Region, Industry and Time FE | YES | YES | YES | YES | YES |
| Observations | 640 | 640 | 640 | 640 | 640 |
| $R^2$ | 0.551 | 0.551 | 0.553 | 0.574 | 0.589 |

Notes: *, **, and *** denote statistical significance levels of 10, 5 and 1 per cent, respectively. $p$-values in parentheses.

share of explained variation ($R^2$). To account for potential omitted variables and measurement issues, region and industry fixed effects substitute for regional and industrial characteristics (see Wolf [2007a, p.36] and Klein and Crafts [2012, p.786]). Time fixed effects are included to capture any time-variant shock affecting all regions and all industries equally. Cross-sectional data are pooled over time which results in 640 observations.[26] The middle portion of the table reports the estimated coefficients on the interaction variables - the primary regressors of interest.

Models 1 to 5 include interaction variables capturing HO, NEG and Path Dependence using a forward step-wise method. Models 1 to 3 concern HO only staring with labour interactions

[26]Performing a Chow F-test on the coefficients in two sub-samples (1932-1935 and 1936-1939) does not reject the null hypothesis of the same coefficients over time.

in model 1, and adding capital and energy interactions in models 2 and 3. NEG effects are controlled for in model 4. Finally, path dependence is added in model 5. Around 59 % of the variation in the location of industry in interwar Yugoslavia is explained when all three theories are accounted for. Heckscher-Ohlin, New Economic Geography, and Path Dependence theories each have one statistically significant representative. Three interaction variables stand out. Skilled labour, input linkages, and path dependence are highly statistically significant and estimated with a positive sign. Skilled labour intensive industries were attracted to high wage regions. New Economic Geography worked through the interplay of market potential and input linkages. Path Dependence arose as sunk costs in capital exceeded the benefits of relocation.

### 2.4.2. Estimation using Generalized Method of Moments

Baseline pooled OLS results may be biased for several reasons. The location of industry may be serially correlated. Industrial location may be endogenous to market potential. Since the baseline specification is likely to contain serial correlation and endogenous regressors a better method of estimation is Generalized Method of Moments (GMM) [Arellano and Bond, 1991, Roodman, 2009]. Moreover, as discussed in section 2.3.1 Hecksher-Ohlin (HO) and New Economic Geography (NEG) theories operate under different assumptions regarding the production function. Therefore it is worth estimating the effects of HO and NEG on industrial location using separate regression equations.

Table 2.7 presents the results of GMM estimation. To control for serial correlation Models 1 to 5 include the lagged dependent variable. Models 1 to 3 estimate HO forces by adding interaction terms capturing the effects of labour, capital and energy in a step-wise manner. Models 4 and 5 estimate NEG effects by in turn accounting for (domestic and foreign) sales and input linkages. In the GMM setup the lagged dependent variable and NEG interactions are treated as endogenous.

Results reported in in table 2.7 show that the lagged dependent variable, skilled labour as well as forward and backward linkages on domestic markets are estimated as statistically

**Table 2.7:** *Modeling Yugoslav industrial location 1932-1939: Difference-GMM (one-step) estimations including time fixed effects*

| | Model 1 GMM | Model 2 GMM | Model 3 GMM | Model 4 GMM | Model 5 GMM |
|---|---|---|---|---|---|
| I Heckscher-Ohlin | | | | | |
| Unskilled labour | 0.2784 | 0.2576 | 0.2664 | | |
| | (0.309) | (0.352) | (0.333) | | |
| Skilled labour | 1.2431** | 1.3019** | 1.3104** | | |
| | (0.031) | (0.025) | (0.023) | | |
| Capital | | -0.0009 | -0.0009 | | |
| | | (0.231) | (0.226) | | |
| Energy | | | 0.0012 | | |
| | | | (0.408) | | |
| II NEG | | | | | |
| Domestic sales linkages | | | | 1.3350*** | |
| | | | | (0.003) | |
| Foreign sales linkages | | | | 2.0110 | |
| | | | | (0.256) | |
| Domestic input linkages | | | | | 1.1196* |
| | | | | | (0.093) |
| Foreign input linkages | | | | | 0.4585 |
| | | | | | (0.704) |
| III Path Dependence | | | | | |
| Lagged dependent variable | 0.6013*** | 0.5896*** | 0.5853*** | 0.5514*** | 0.5567*** |
| | (0.000) | (0.000) | (0.000) | (0.000) | (0.000) |
| Time FE | YES | YES | YES | YES | YES |
| Observations | 480 | 480 | 480 | 480 | 480 |

Notes: *, **, and *** denote statistical significance levels of 10, 5 and 1 per cent, respectively. $p$-values in parentheses.

significant and with a positive sign. A comparison with baseline pooled OLS results is in order. Skilled labour interaction is found significant in both the baseline and GMM estimation. However, the estimated coefficient on the skilled labour interaction is lower in GMM estimation indicating an upward bias of POLS. GMM estimation also reveals that linkages on domestic markets mattered and that POLS overestimates the effect of NEG. The importance of the lagged dependent variable is in accordance with the finding from the baseline estimation that path dependence matters - the past has an influence on the present location of industry.

### 2.4.3. Statistical, economic and international relevance of industrial location determinants

Table 2.8 shows standardized beta coefficients of statistically significant interaction variables from table 2.7. Standardised beta coefficients allow a comparison of the relative size of the estimated coefficients by expressing them in the same units (standard deviations). The size of NEG coefficients accounted for more than Heckscher-Ohlin and Path Dependence coefficients taken together. Results show that while all three of the tested theories mattered, New Economic Geography forces were the dominant drivers of Yugoslav industrial location.

**Table 2.8:** *Standardized beta-coefficients of statistically significant interaction variables*

| | Table 2.7, model 1 | Table 2.7, model 4 | Table 2.7, model 5 |
|---|---|---|---|
| I Heckscher-Ohlin | | | |
| Skilled labour | 0.491** | | |
| II New Economic Geography | | | |
| Domestic sales linkages | | 0.995*** | |
| Domestic input linkages | | | 0.468* |
| III Path Dependence | | | |
| Lagged dependent variable | 0.602*** | 0.552*** | 0.558*** |

Notes: *, ** and *** denote statistical significance levels of 10, 5 and 1 percent respectively. Relative shares in parentheses.

The economic importance of statistically significant HO and NEG interactions can be evaluated by simulating the effect of a change in the explanatory variables of interest on the

predicted values of the dependent variable.[27] Table 2.9 presents the results of the simulation. Columns 2 to 4 show the per cent change in regional share of industry (dependent variable) after simulating a 10 per cent increase in skilled labour, domestic sales or input linkages, respectively. Counterfactual increases in domestic input linkages have the largest economic effect increasing industrial location shares by 7.42% on average. In all three simulations regions with a lower share of industry (e.g. South Serbia, Montenegro, Bosnia-Herzegovina) benefit more from the increases than do regions with a higher share of industry (e.g. Slovenia, Croatia-Slavonia, Vojvodina).

**Table 2.9:** *Regional simulations: Economic importance of HO and NEG compared*

| | Simulation 1 skilled labour | Simulation 2 domestic sales linkages | Simulation 3 domestic input linkages |
|---|---|---|---|
| | Per cent changes in share of industry | | |
| South Serbia | 1.72 | 5.71 | 8.81 |
| Montenegro | 1.64 | 5.64 | 8.41 |
| Bosnia-Herzegovina | 1.44 | 5.12 | 7.55 |
| Dalmatia | 1.36 | 4.96 | 7.04 |
| North Serbia | 1.31 | 4.96 | 7.49 |
| Vojvodina | 1.24 | 4.70 | 6.92 |
| Croatia-Slavonia | 1.18 | 4.66 | 6.82 |
| Slovenia | 1.08 | 4.42 | 6.31 |
| average | 1.37 | 5.02 | 7.42 |

Notes: The table shows the predicted effect of a 10 per cent increase in regional characteristics (skilled wages and domestic market potential) on regional shares of industry. The predicted effects are based on table 2.7 models 1, 4, and 5.

Yugoslav industrial location determinants are placed in an international comparative perspective by adding them to the findings of other empirical papers which rely on the Midelfart-Knarvik et al. [2000, 2001] model and contain at least one cross-section from the interwar period. Table 2.10 summarizes the determinants of industrial location during the interwar period, across five countries - Britain, Poland, Spain, US and Yugoslavia. The table reports the mechanism at work (column four), the theory the mechanism represents

[27] For a similar approach see Klein and Crafts [2012].

**Table 2.10:** *Determinants of industrial location during the interwar period (c.1920-1939)*

| Country | Source | Time frame | Mechanism[a] | Theory | Stand. $\beta$ coeff. relative shares[b] |
|---|---|---|---|---|---|
| Britain | Crafts and Mulatu [2005, Table 6] | 1921, 1931 | Human capital | HO | n.a. |
| | | | Coal energy | HO | n.a. |
| Poland | Wolf [2007a, Table 8] | 1926-1934 | Human capital | HO | 0.48 |
| | | | Innovation | HO | 0.15 |
| | | | Input linkages | NEG | 0.38 |
| Spain | Martínez-Galarraga [2012, Table 7] | 1929 | Agriculture | HO | 0.45 |
| | | | Scale effects | NEG | 0.55 |
| US | Klein and Crafts [2012, Table 13] | 1920 | Input linkages | NEG | 0.45 |
| | | | Sales linkages | NEG | 0.16 |
| | | | Scale effects | NEG | 0.39 |
| Yugoslavia | Present paper [Table 2.8] | 1932-1939 | Skilled labour | HO | 0.19 |
| | | | Dom. sales/input linkages | NEG | 0.57 |
| | | | Path Dependence | PD | 0.14 |

*Notes:* [a]Mechanisms at work are labeled in accordance with usage in present chapter. See individual country papers for interaction variables and data underlying these mechanisms. [b]Only standardised beta coefficients of *statistically significant* interactions are included in the calculation of the relative shares.
*Sources:* Own calculations based on sources provided in column 2.

(column five), and the relative shares of standardized beta coefficients of statistically significant interaction variables (column six).[28] The values reported in column six are own calculations based on beta coefficients reported in individual country papers cited in column two.

In interwar Poland, Spain and Yugoslavia both HO and NEG forces determined the location of industry simultaneously. The Anglo-American interwar experience stands out as HO theory in the case of Britain and NEG in the case of the US can fully account for the location of industry. In Spain the effect of NEG was stronger than HO (0.55 vs 0.45), while in Poland HO forces had a larger relative share than NEG (0.63 vs 0.38). In Yugoslavia NEG effects were the strongest, followed by HO, and Path Dependence. Comparing the individual mechanisms at work shows that Yugoslavia compares most favorably to Poland, as similar HO and NEG effects determined the location of industry in these Eastern European countries. On the contrary, in Spain agricultural factor endowments and scale effects determined the location of industry. The difference between Spain and Yugoslavia is in accordance with the finding of Martínez-Galarraga [2012, p.273] who concluded that 'although Poland and Spain were economies of a similar size on the periphery of Europe' the driving forces of industrial location in the two countries were different.

## 2.5 Summary and Conclusion

What determines the location of industry within a country? Theoretical predictions of three theories - Heckscher-Ohlin, New Economic Geography, and Path Dependence - were quantified and compared using panel data econometrics and a novel dataset on interwar Yugoslavia. Results show that all three theories mattered and that New Economic Geography forces played a dominant role.

The results reinforce the consensus view in the literature that several theories can simultaneously explain the distribution of industrial activity. Put in an international perspective, both Heckscher-Ohlin and New Economic Geography forces determined industrial location in three peripheral interwar economies - Poland, Spain, and Yugoslavia. On the other hand,

[28] The labeling of the mechanisms at work is in accordance with the ones used in the present paper. See individual papers (cited in column 2 of Table 2.10) for details.

the Anglo-American interwar experience stands out as either Heckscher-Ohlin (Britain) or New Economic Geography (US) can fully account for the location of industry within these countries.

The results provide empirical evidence on the effect of sunk costs on industrial location, which is in line with the recent findings of Crafts and Wolf [2014]. The main novelty is that Path Dependence can affect the location of industry in addition to Heckscher-Ohlin and New Economic Geography forces. Therefore, an interesting avenue for future research could be to establish just how far-reaching are the effects Path Dependence on the present day location of industrial activity.

## 2.6 Appendix A - Data Appendix

**Location of Industry**

*Definition*: Share of region $i$ in total industrial employment of industry $k$, weighted by population share of region $i$.

*Sources*: [Središni ured za osiguranje radnika, 1932-1941] and [Kraljevina Jugoslavija, 1940].

**Regional Characteristics:**

**1. Coal availability**

*Definition*: Nominal price in dinar for 10kg of coal (brown and lignite) in city c, taken to proxy prices in region $i$.

*Notes*: Some missing prices linearly interpolated. Prices for Montenegro proxied by average of adjacent regions. If more than one city c in region $i$, arithmetic average of prices in c was taken.

*Sources*: Various issues of [Kraljevina Jugoslavija, 1932-1941].

**2. Wood availability**

*Definition*: Nominal price in dinar for one $m^3$ of firewood in city c, taken to proxy prices in region $i$.

*Notes*: If more than one city c in region $i$, arithmetic average of prices in c was taken.

*Sources*: Various issues of [Kraljevina Jugoslavija, 1932-1941].

**3. Unskilled labor wages**

*Definition*: Nominal daily laborer's wage in dinar in city c, taken to proxy unskilled labor wages in region $i$.

*Notes*: If more than one city c in region $i$, arithmetic average of wages in cities c was taken.

*Sources*: Various issues of [Kraljevina Jugoslavija, 1932-1941].

**4. Skilled labour wages**

*Definition*: Nominal daily insured laborer's wage in dinar in city c, taken to proxy skilled labor wages in region $i$.

*Notes*: If more than one city c in region $i$, arithmetic average of wages in cities c was taken.

*Sources*: [Središni ured za osiguranje radnika, 1932-1941].

**5. Urbanization rates**

*Definition*: Share of regional population living in cities of 10000 or more inhabitants in total population of a region.

*Notes*: Data for sample period linearly interpolated by census data for 1931 and 1948. Data from 1948 corrected for post Second Worls War territorial changes.

*Sources*: [FNR Jugoslavija, 1951, Kraljevina Jugoslavija, 1937].

**6. Market potential**

*Definition and Sources*: See Appendix B.

**7. Inherited industry ratio**

*Definition*: Total number of factories established pre-1918 in region $i$ / total number of factories established during interwar in region $i$, by year $t$.

*Sources*: [Ministarstvo trgovine i industrije, 1941].

**Industrial Intensities:**

**1. Coal intensity**

*Definition*: Industry $k$ use of domestically produced coal (brown and lignite) in dinar / industry $k$ gross value of output in 1000 dinar.

*Notes*: Coal intensity for tobacco industry proxied by industry average.

*Sources*: [Ministarstvo trgovine i industrije, 1941], [Demokratska Federativna Jugoslavija, 1945].

**2. Wood intensity**

*Definition*: Industry $k$ use of wood / industry $k$ gross value of output in 1000 dinar.

*Notes*: Wood intensity for tobacco industry proxied by industry average.

*Sources*: [Ministarstvo trgovine i industrije, 1941], [Demokratska Federativna Jugoslavija, 1945].

**3. Unskilled labor intensity**

*Definition*: Share of unskilled labour in total labour in industry $k$.

*Sources*: [Ministarstvo trgovine i industrije, 1941].

**4. Skilled labor intensity**

*Definition*: Share of skilled labour in total labour in industry $k$.

*Sources*: [Ministarstvo trgovine i industrije, 1941].

**5. Capital intensity**

*Definition*: Industry $k$ capital stock value in dinar / total industry capital stock value in dinar.

*Sources*: [Ministarstvo trgovine i industrije, 1941].

**6. Sales to industry**

*Definition*: Share of industry $k$ sales to domestic and foreign industry (i.e. including exports) in total available resources of industry $k$.

*Notes*: The first input-output table available for the Yugoslav economy (constructed for the year 1955) was used.

*Sources*: [Petrović, 1957].

**7. Inputs from industry**

*Definition*: Share of industry $k$ use of domestic and foreign intermediates (i.e. including imports) in total available resources of industry $k$.

*Notes*: We used the first input-output table available for the Yugoslav economy (for the year 1955).

*Sources*: [Petrović, 1957].

## 2.7 Appendix B - Market potential calculation

According to the basic market potential equation market potential of region i, $MP_i$, can be expressed as:

$$MP_i = \sum_j Y_j / D_{ij} \tag{2}$$

where $Y_j$ is the measure of economic size of region j (usually GDP) and $D_{ij}$ is the distance between regions i and j. Market potential can be split into its domestic and foreign components:

$$MP_i = domesticMP_i + foreignMP_i \tag{3}$$

or equivalently:

$$MP_i = \overbrace{\sum Y_j/D_{i,j} + \underbrace{Y_i/D_{i,i}}_{\text{self-potential}}}^{\text{domestic MP}} + \overbrace{[\sum Y_f (D_{i,f})^{\beta} (T_f)^{\gamma}]}^{\text{foreign MP}} \tag{4}$$

where $Y_j$ and $Y_i$ are domestic regional GDP estimates (j≠i); $D_{i,j}$ are distances between regions i and j; $D_{i,i}$ is own distance in region i; $Y_f$ are GDP estimates of Yugoslavia's main trading partners; $D_{i,f}$ are distance between domestic regional node $i$ and foreign node f; $T_f$ are trade tariffs of Yugoslavia's main trading partners; $\beta$ and $\gamma$ are distance and trade elasticities, respectively.

Starting with domestic market potential we need to obtain regional GDP estimates for eight domestic regions as well as the distances between them. For calculation of distances, we choose regional capitals (Belgrade, Ljubljana, Niš, Novi Sad, Sarajevo, Skopje, Split, Zagreb) as the relevant nodes as they were the center of within region market activity. The distance matrix is then constructed using railway distances since - as table 2.11 shows - the vast majority of domestic trade was carried out using railways. Domestic trade carried out over sea remained below five per cent throughout the interwar and the bulk of trade via rivers was confined to the Belgrade-Novi Sad link (cf. section 3.4.3). To construct the railway distance matrix we used relevant domestic distance tables [Ministarstvo saobraćaja, 1925a, 1930, 1933a, 1935, 1937].

**Table 2.11:** *Yugoslav domestic and foreign trade by means of transport (as % of domestic or foreign trade volume), 1925-1938*

| | Domestic trade | | | Foreign trade | | |
|---|---|---|---|---|---|---|
| Year | Railway | Sea | River | Railway | Sea | River |
| 1925 | 89.1 | 2.9 | 8.0 | 78.7 | 11.1 | 10.1 |
| 1926 | 87.8 | 2.8 | 9.4 | 77.4 | 12.5 | 10.0 |
| 1927 | 86.9 | 3.9 | 9.2 | 80.2 | 13.7 | 6.2 |
| 1928 | 86.6 | 4.0 | 9.4 | 76.9 | 16.6 | 6.5 |
| 1929 | 89.3 | 3.6 | 7.1 | 72.7 | 18.2 | 9.1 |
| 1930 | 84.4 | 3.6 | 12.0 | 70.5 | 19.2 | 10.3 |
| 1931 | 82.6 | 4.1 | 13.3 | 71.9 | 19.0 | 9.1 |
| 1932 | 81.4 | 4.3 | 14.3 | 73.8 | 19.2 | 7.0 |
| 1933 | 83.0 | 4.6 | 12.3 | 72.1 | 19.0 | 8.9 |
| 1934 | 78.6 | 5.0 | 16.4 | 71.7 | 18.0 | 10.3 |
| 1935 | 78.2 | 5.0 | 16.8 | 74.4 | 19.2 | 6.4 |
| 1936 | 78.5 | 4.8 | 16.7 | 75.4 | 15.9 | 8.7 |
| 1937 | 79.6 | 4.0 | 16.4 | 72.2 | 16.8 | 11.0 |
| 1938 | 79.1 | 3.9 | 17.0 | 76.4 | 15.6 | 8.0 |

*Sources:* [Kraljevina Jugoslavija, 1932-1941] and [Jugoslovenske državne železnice, 1930, 1934, 1938]

As concerns regional GDP, we apply the methodology of Geary and Stark [2002] to the case of Yugoslavia as follows. Total Yugoslav GDP ($Y_{yug}$) can be expressed as the sum of i regional GDPs:

$$Y_{yug} = \sum Y_i \tag{5}$$

where $Y_i$ is GDP of a region $i$ defined as:

$$Y_i = \sum y_{ij} L_{ij} \tag{6}$$

where $y_{ij}$ is output per worker in region i in sector j and $L_{ij}$ is the corresponding number of workers in region i and sector j. As there are no data available for $y_{ij}$, this value can be approximated by using Yugoslav sectoral output per worker ($y_j$) and assuming that regional labour productivity in each sector is reflected by its wage relative to the Yugoslav average ($w_{ij}/w_j$). Then regional GDP will be given by:

$$Y_i = \sum [y_j \beta_j (w_{ij}/w_j)] L_{ij} \tag{7}$$

where $y_j$ is Yugoslav output per worker in sector j, $w_{ij}$ is the wage paid in region i in sector j and $w_j$ is the Yugoslav average wage in sector j; $\beta$ is a scalar which preserves the relative regional differences but scales the absolute levels so that regional totals for each sector sum to the known Yugoslav total; and $L_{ij}$ is as before the number of workers in region i and sector j.

Thus we require data on known Yugoslav GDP, sectoral output shares, nominal wages by economic sector and region, and active population by economic sector and region on a yearly basis. The Yugoslav GDP data comes from the updated Maddison dataset [Bolt and van Zanden, 2013]; the sectoral output shares are taken from Stajić [1959]; nominal wages by economic sector and region come from [Radnička komora za Hrvatsku i Slavoniju, 1929-1941] and [Središni ured za osiguranje radnika, 1932-1941]; and the number of workers per sector of the economy come from the relevant Censuses of Population for 1931 and 1948 ([Kraljevina Jugoslavija, 1940] and [FNR Jugoslavija, 1954], books IV and III respectively) with yearly data between these dates being linearly interpolated.

The part of domestic market potential comprised of the self-potential of each region can be expressed as:

$$SP_i = Y_i/D_{ii} \tag{8}$$

where self-potential $SP_i$ is calculated by dividing the estimated GDP of region i with the internal distance of the same region. We follow Keeble et al. [1982, p.425] to estimate the internal distance as:

$$D_{ii} = 0.333\sqrt{(area_i/\pi)} \tag{9}$$

where $D_{ii}$ is the internal distance in region i calculated as one third of the radius of a circle, where $area_i$ is the area (in $km^2$) of region i. Hence domestic market potential can be represented as:

$$domesticMP_i = \sum Y_i/D_{ij} + SP_i \tag{10}$$

Next, foreign market potential has to be added. The pull of a foreign market depends on the size of the foreign market (as measured by GDP) which needs to be reduced by the distance between the domestic and foreign regions and trade tariffs of Yugoslavia's main

trading partners. These relations can be represented as:

$$foreignMP_i = \sum Y_f (D)_{if}^{\beta} (T)_f^{\gamma} \tag{11}$$

where $Y_f$, $D_{i,f}$, $T_f$, $\beta$ and $\gamma$ are as previously defined under equation 4.

In order to calculate foreign market potential we need data on GDP and trade tariffs of Yugoslavia's main trading partners, distances between domestic and foreign nodes as well as distance and tariff elasticities. Table 2.12 establishes Yugoslavia's main trading partners by showing Yugoslavia's trade shares with Austria, Italy, Germany, Czechoslovakia during 1920-1938. More than half of Yugoslavia's total international trade during the interwar was consistently captured by these four countries (the observation does not change if only imports or exports are considered). Hence we rely on these four countries (plus the UK which ranks as fifth) for the calculation of foreign market potential. The GDP data of these foreign countries comes from [Maddison, 2003] and [Bolt and van Zanden, 2013].

**Table 2.12:** *Yugoslavia's trade with Austria, Italy, Germany and Czechoslovakia (as % of total trade value), 1920-1938*

| Country | Trade | 1920 | 1923 | 1926 | 1928 | 1932 | 1935 | 1938 |
|---|---|---|---|---|---|---|---|---|
| Austria | Exports to | 42.67 | 28.93 | 20.59 | 17.9 | 22.13 | 14.32 | 6.06 |
| | Imports from | 20.6 | 26.94 | 20.08 | 17.29 | 13.43 | 11.92 | 6.88 |
| Italy | Exports to | 27.13 | 30.11 | 25.07 | 26.05 | 23.07 | 16.68 | 6.42 |
| | Imports from | 36.68 | 17.91 | 13.82 | 11.99 | 12.66 | 10.02 | 8.94 |
| Germany | Exports to | 7.52 | 4.22 | 9.27 | 12.09 | 11.28 | 18.65 | 35.94 |
| | Imports from | 1.45 | 8.72 | 12.03 | 13.61 | 17.71 | 16.16 | 32.52 |
| Czechoslovakia | Exports to | 5.12 | 7.82 | 12.01 | 8.99 | 12.17 | 13.4 | 7.89 |
| | Imports from | 9.28 | 18.5 | 18.7 | 17.9 | 15.63 | 13.97 | 10.65 |

*Sources:* [Kraljevina Jugoslavija, 1932-1941]

Trade tariffs of foreign countries are measured as $(1+t_f)$ where $t_f$ is the ratio of customs revenue over value of imports of Yugoslavia's main trading partners. Data for tariff calculations are taken from [Mitchell, 2013]. Table 2.13 reports the customs revenue over value of imports for Austria, Italy, Germany, Czechoslovakia and UK that were used in the calculations. Note that the measure does not include non-tariff barriers that were considerable in the 1930s. This means that the reported foreign market potential is upward biased.

Following the logic of choosing domestic nodes, foreign country capitals (Vienna, Rome, Berlin, Prague, London) are used as foreign nodes. To calculate the distance matrix including the foreign nodes, we use contemporary international railway distances which come from Cook [1939]. As with domestic market potential international trade is assumed to be conducted exclusively via rail given that railway were the dominant transport mean for Yugoslav trade during the interwar (see table 2.11). The elasticities of $\beta$ = -0.8 and $\gamma$ = -1 (for distances and tariffs, respectively) come from the gravity equations (addressing the interwar period) which were calculated by Estevadeordal et al. [2003].

**Table 2.13:** *Trade tariffs of Austria, Italy, Germany, Czechoslovakia and UK (customs revenue over value of imports), 1932-1939*

| year | AUT | ITA | GER | CZE | UK |
|---|---|---|---|---|---|
| 1932 | 0.17 | 0.24 | 0.24 | 0.11 | 0.23 |
| 1933 | 0.16 | 0.25 | 0.25 | 0.11 | 0.27 |
| 1934 | 0.18 | 0.24 | 0.26 | 0.10 | 0.25 |
| 1935 | 0.17 | 0.22 | 0.30 | 0.10 | 0.26 |
| 1936 | 0.17 | 0.23 | 0.32 | 0.09 | 0.25 |
| 1937 | 0.15 | 0.09 | 0.29 | 0.07 | 0.22 |
| 1938 | *0.15* | 0.12 | 0.33 | *0.09* | 0.25 |
| 1939 | *0.15* | 0.11 | 0.33 | *0.10* | 0.30 |

*Notes:* Due to a lack of data for Austria 1938-1939 customs revenues and value of imports assumed the same as in 1937; Czechoslovak customs revenues for 1938-1939 also assumed the same as in 1937.
*Sources:* [Mitchell, 2013]

Final estimates of market potential are expressed in 1990 Geary-Khamis dollars. GDP in constant terms is preferable over current GDP for the interwar period because of highly volatile exchange rates that could influence the relative size of economies depending on the year selected [Crafts, 2005a, p. 1161].

# 3 | Market Integration of a Uniquely Diverse Country


## Abstract

There is evidence of increasing domestic market integration at the core of interwar Europe. Was this the case at the European periphery? The chapter uses a novel data set to study commodity market integration in interwar Yugoslavia - a peripheral, newly-established and uniquely diverse economy. Institutional and infrastructural advancements reduced trade costs and brought Yugoslav markets significantly closer together. Cultural diversity did not affect the progress of Yugoslav market integration. Therefore domestic market integration also improved at the periphery of Europe. Findings call for more optimism on the relationship between cultural diversity and market integration in Yugoslavia.


## 3.1 Introduction

Contrary to the first era of globalisation the interwar period witnessed international economic disintegration [Federico and Persson, 2007]. The dissolution of European Empires disrupted established trade networks and in many ways created new barriers to international trade [Feinstein et al., 2008, pp. 31-34]. During the 1930s international trade was especially hampered by protectionist policies [Irwin, 2012]. Domestic market integration may have benefited in a setting of reduced access to foreign markets.

There is limited research on domestic market integration in interwar Europe despite the last two decades being a 'golden age' [Federico, 2012, p.471] for studies on market integration.[29] The predominant share of the literature has concentrated on international market integration (for a comprehensive list see Federico [2012, Appendix S1]). There is evidence on improving domestic market integration during the interwar at the core of Europe (Germany) [Wolf, 2009]. Was this the case in the rest of Europe? In the present chapter we look at the periphery of Europe and investigate domestic market integration of a newly established and uniquely diverse interwar economy - Yugoslavia.[30]

[29] Surveying modern English language literature Federico [2012, p.472] found that out of more than sixty studies on the topic only six concern the interwar period.

[30] Little qualitative research has been produced on the progress of market integration of Yugoslavia during the interwar period - on economic integration in general see Lampe [1980] and Bićanić and Škreb [1994].

Territories that came to form Yugoslavia vastly differed in their economic development but also in their ethno-religious composition (see Chapters 1 and 2) owing to different heritage from the Austro-Hungarian and Ottoman Empires.[31] Yugoslavia is particularly interesting for studying market integration as both trade-creating and trade-diverting forces could have been at work. The unification of fiscal, monetary and transport systems would have increased market integration by lowering transport and transaction costs. However, cultural diversity could have been a trade barrier increasing transaction costs.

The present chapter asks two closely related research questions. Were Yugoslav markets integrating during the interwar period? If so, which factors help explain market integration? The main contribution of the chapter is to the literature that measures and explains market integration [Federico, 2012]. By providing the missing economic history perspective on Yugoslav market integration the present research also relates to the question of the long-term viability of the Yugoslav state often discussed in political historiography [Čalić, 2013, Lampe, 2000].

The chapter is organised as follows. In the next section commodity market integration in Yugoslavia in the period from 1922 to 1939 is portrayed using a novel data set. In section 3.3, early market integration and episodes of disintegration are described. In section 3.4, commodity market integration is modeled using a set of trade costs. The final section summarises and concludes.

## 3.2 Commodity market integration in interwar Yugoslavia (1922-1939)

Were Yugoslav markets integrating during the interwar period? One way of quantitatively approaching this question is to analyse commodity price dispersion across regions. For example, one could test the first condition of the Law of One Price - that 'prices take the same level throughout [an entire territory]' [Federico, 2012, p. 474] - by measuring the variation of prices at different locations. Some variation in prices is expected due to transaction costs - trade

[31] Interwar Yugoslavia was comprised of Serbia and Montenegro, several former Austro-Hungarian lands, and small parts of Bulgaria. Serbia and Montenegro were independent Kingdoms before the First World War. Several territories from both parts of Austria-Hungary came to form Yugoslavia. On the one side parts of Carniola and Lower Styria, as well as the Kingdom of Dalmatia were former Cisleithanian lands. On the other, Kingdom of Croatia-Slavonia and parts of Banat were former Transleithanian lands. Furthermore, Bosnia-Herzegovina was jointly administered by both parts of the Dual Monarchy.

among markets allows the forces of arbitrage to close the gap between market prices until it equals transaction costs [Federico, 2012, p. 475]. Hence, if markets trade prices can be equal only if there are no transaction costs, while if they do not trade prices can be equal by chance [Federico, 2012, p. 478].

### 3.2.1. Data set and overall picture

A new data set of commodity prices observed over a same set of cities during the period from 1922 to 1939 is used to measure price dispersion across Yugoslavia. Data is available on a yearly frequency (reported in data sources as 12 month averages). The regional dimension is comprised of ten cities: Banja Luka, Belgrade, Cetinje, Ljubljana, Niš, Novi Sad, Sarajevo, Skopje, Split and Zagreb. Both the time and regional dimensions are determined by data availability. The sample period covers almost the entire interwar period, while the sample of cities provides a wide regional coverage of Yugoslavia. Each of the ten cities was a regional capital of the administrative region it was located in.

Official statistical yearbooks of the Kingdom of Yugoslavia [Kraljevina Jugoslavija, 1932-1941] provide retail price data of nineteen homogeneous products in the ten regional capitals for the period from 1926 to 1939. Price series were extended back to 1922 for the same set of cities for eleven of the nineteen goods using using an additional data source [Ministarstvo poljoprivrede, 1924-1931]. Table 3.1 summarizes the commodity dimension of the data set.

Driven by data availability most studies use wholesale prices for a limited number of grain markets [Federico, 2012, p. 486]. The present research explores a rich set of mainly retail price data. The advantage of such an approach is that it gives a more representative picture of commodity market integration than analysing grain markets only. Wholesale prices may be preferable if arbitrage is considered to be driven solely by wholesale traders. Relying on retail prices would not yield biased results if the difference between wholesale and retail prices for a given commodity was constant. The difference would depend on consumer taxes and mark-ups. Consumer taxes are set by the government while mark-ups are decided by the retailer. Consumer taxes were equal across the whole country after the imposition of the

**Table 3.1:** *Summary of the commodity dimension of the data set*

| No. | Commodity | from 1922 to 1925 | from 1926 to 1939 |
|---|---|---|---|
| 1 | beans | whs | retail |
| 2 | beef | retail | retail |
| 3 | cheese | retail | retail |
| 4 | corn flour | whs | retail |
| 5 | dried plums | whs | retail |
| 6 | lard | retail | retail |
| 7 | milk | retail | retail |
| 8 | mutton | retail | retail |
| 9 | pork | retail | retail |
| 10 | potatoes | whs | retail |
| 11 | wheat flour (white) | whs | retail |
| 12 | bread (white) | n.a. | retail |
| 13 | bread (brown) | n.a. | retail |
| 14 | butter | n.a. | retail |
| 15 | eggs | n.a. | retail |
| 16 | rice | n.a. | retail |
| 17 | soap | n.a. | retail |
| 18 | wheat flour (brown) | n.a. | retail |
| 19 | wood | n.a. | retail |

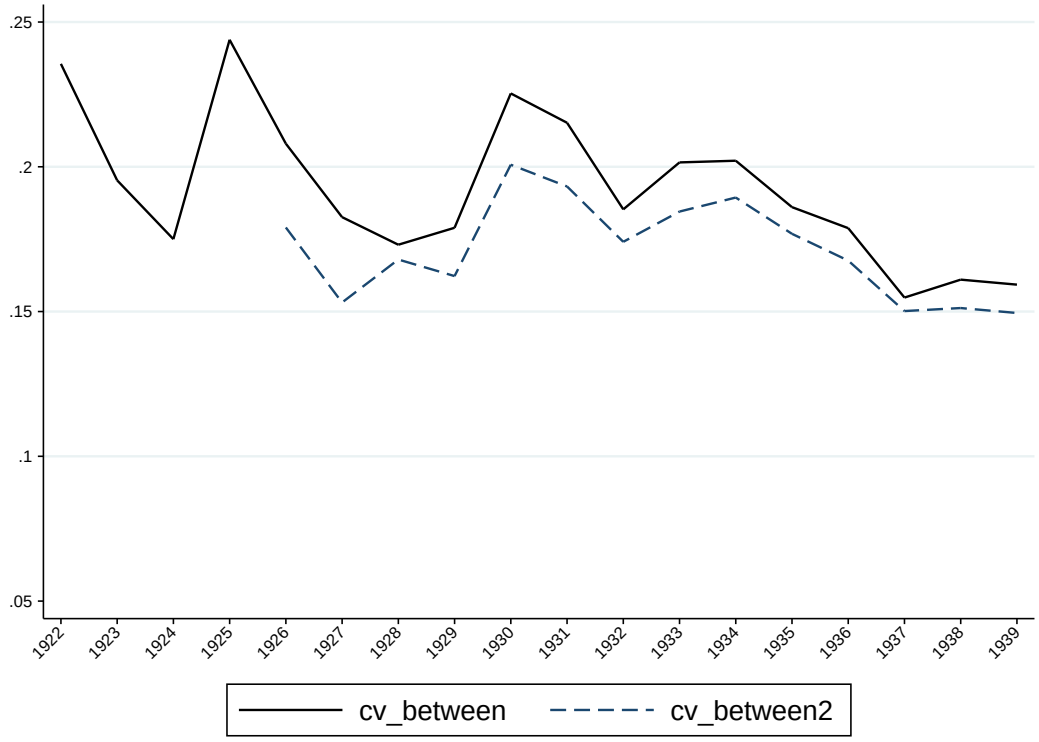
*Sources:* See text.

Law on State Excise, Taxes and Fees in 1921 [Ministarstvo finansija, 1939, p. 107]. Data on changes in mark-ups is unavailable. It is, however, a reasonable assumption that retailers would change mark-ups proportional to changes in wholesale prices.

Following a long tradition in studies on market integration, price dispersion is measured using the coefficient of variation (CV). This statistical tool is simple to compute, intuitive and easy to compare across time and space for a given set of goods [Federico, 2007, p.297] [Federico, 2011, p. 96]. Consider commodity k that is priced in city i at time t. Commodity-specific coefficients of variation are computed by calculating the CV for each $k$, over a set of cities $i$ at time $t$. Treating information from all commodity markets equally, a simple average of commodity-specific coefficients of variation produces the series representing Yugoslav commodity market integration. The interpretation is straightforward - the lower the coefficient of variation the higher market integration (and vice versa).

Figure 3.1 shows commodity market integration in Yugoslavia for the period from 1922 to 1939 as measured by the coefficient of variation. The solid series running from 1922 to 1939 is

**Figure 3.1:** *Coefficient of variation (CV) between cities, Yugoslavia 1922-1939*




*Notes*: Solid series - CV of commodity prices over $i$ cities, in year $t$, unweighted average of $k$ commodities ($i$=10, $t$=18, $k$=11); Dashed series - CV of commodity prices over $i$ cities, in year $t$, unweighted average of $k$ commodities ($i$=10, $t$=14, $k$=19)
*Sources*: own calculation based on data from [Kraljevina Jugoslavija, 1932-1941] and [Ministarstvo poljoprivrede, 1924-1931].

the average coefficient of variation of the first eleven commodities shown in table 3.1. The dashed series starting in 1926 and ending in 1939 is the average coefficient of variation of the nineteen commodities shown in table 3.1. The two series show the same trend while there is a small level difference. Both series show that commodity market integration in Yugoslavia increased during the interwar period. According to the solid series the CV decreased from around 0.24 in 1922 to 0.16 in 1939. The early years (1922-1924) brought a sharp decline in the CV which was nevertheless interrupted by a disintegration shock in 1925. Integration then proceeded again until the onset of the Great Depression. Another disintegration shock sharply increased the CV in 1930. On a whole, the rest of the 1930's was a period in which a trend of increased market integration was recorded.

The two disintegration shocks can be explained by asymmetric deflation - prices of agricultural goods fell faster than transport costs. Asymmetric deflation provided a dis-incentive to engage in domestic trade and in turn decreased market integration. A similar effect was

recorded in the USA in the early 1930s [Federico and Sharp, 2013]. In Yugoslavia in 1925 and 1930 general wholesale prices fell by around 20 per cent [Dukanac, 1946] while railway transport costs reduced by only 10 and 2 per cent respectively.[32]

Was the observed progress in Yugoslav commodity market integration during the interwar statistically significant? Table 3.2 columns three and four report the average and commodity specific coefficient of variation (CV) for 1922 and 1939. The last column shows the average rates of change in per cent for the period from 1922 to 1939. The average rate of change was estimated using a fixed-effect panel regression including a time trend. Product-specific rates of change were estimated using a fixed-effect panel regression with product-specific time trends. In both cases a log-linear specification was used following Federico [2011, p. 97].

The progress of Yugoslav market integration from 1922 to 1939 was highly statistically significant. Seven out of eleven product markets became better integrated over time. Progress on most commodity markets was statistically significant. Markets for lard and wheat flour - the two most integrated markets in 1922 - were slightly less integrated by 1939. The markets for mutton and cheese were also less integrated by the end of the sample period. The persistently high coefficient of variation for cheese suggests some quality differentials.

The commodity dimension enables us to explore the differences in inference when looking at a large number of markets rather than concentrating only on grain and its derivatives. Taking the market for wheat flower as representative of commodity market integration in Yugoslavia would be highly misleading (cf. table 3.2). First, it would suggest that commodity market integration decreased over time, while in fact in increased. Second, it would overestimate market integration (the CV for wheat flower is much lower from the average CV). This suggests that grain prices seem to provide a lower bound estimate of the CV thus overstating overall commodity market integration. One explanation may be that the markets for grains, as basic foodstuffs, were more developed and thicker than others [Federico, 2012, p. 486].

How successful was Yugoslav market integration in an international perspective? The lack

[32]Railway transport costs are estimated using revenues for transporting goods on state railways per kilometer of state rail track. Own calculation based on [Kraljevina Jugoslavija, 1932-1941].

**Table 3.2:** *Average and commodity specific coefficient of variation (CV) for 1922 and 1939 and average rates of change in per cent (1922-1939)*

| No. | Commodity | CV 1922 | CV 1939 | Yearly Rate (%) 1922-1939 |
|---|---|---|---|---|
| 1 - 11 | average | 0.24 | 0.16 | -0.23*** |
| 1 | lard | 0.06 | 0.08 | 0.14 |
| 2 | wheat flour | 0.11 | 0.13 | -0.07 |
| 3 | pork | 0.14 | 0.09 | 0.04 |
| 4 | corn flour | 0.15 | 0.11 | 0.04 |
| 5 | mutton | 0.18 | 0.19 | 0.27 |
| 6 | beef | 0.21 | 0.09 | -0.44** |
| 7 | milk | 0.21 | 0.14 | -0.57*** |
| 8 | beans | 0.33 | 0.12 | -0.41** |
| 9 | potatoes | 0.34 | 0.17 | -0.92*** |
| 10 | cheese | 0.42 | 0.45 | 0.42** |
| 11 | dried plums | 0.45 | 0.18 | -1.05*** |

*Notes:* Average rate of change estimated using a fixed-effect (FE) panel regression including a time trend. Product-specific rates of change estimated using a FE panel regression with product-specific time trends. In both cases a log-linear specification was used following Federico [2011, p. 97]. ***, ** denote statistical significance at the 1 and 5 per cent level
*Sources:* Own calculation based on data from [Kraljevina Jugoslavija, 1932-1941] and [Ministarstvo poljoprivrede, 1924-1931].

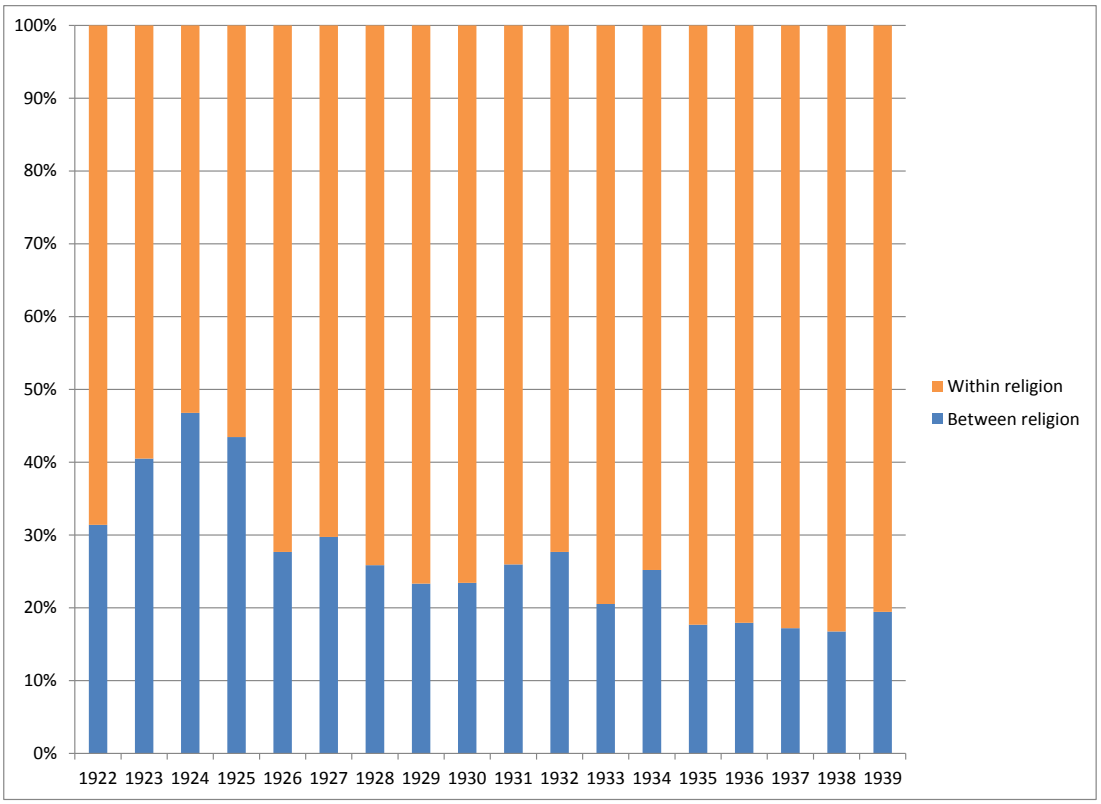
of studies on the interwar prevent contemporaneous international comparisons. According to the CV for wheat flour in interwar Yugoslavia reported in table 3.2 one could argue that commodity market integration in Yugoslavia was similar to that of Austria-Hungary in 1910 as the CV of grain prices was around 0.10 [Schulze and Wolf, 2012, p.663] or in Italy around 1861 as the CV of wheat prices was approximately 0.12 [Federico, 2007, p. 300]. The question remains how overall market integration in Yugoslavia would compare internationally? The predominance of commodity market integration measures based on grain prices does not allow an international comparison with the results for interwar Yugoslavia.

### 3.2.2. Market integration over time and different regions

The general rise in market integration in Yugoslavia does not preclude that some areas may have integrated better than others. Were several regional markets in the making or was there a move towards one national market? A variance decomposition analysis is used to answer this question.

In late nineteenth century Austria-Hungary market integration was asymmetric and progressed along ethno-linguistic lines [Schulze and Wolf, 2012]. In Yugoslavia religion was 'the most obvious criteria to differentiate between ethnic communities' [Čalić, 2013, pp. 138-139]. The regional dimension of the data set allows grouping Yugoslav cities according to the dominant religion in order to test whether market integration progressed along ethno-religious lines. Grouping cities according to the religion which had the largest share of believers results in three groups of cities - those that were dominantly Christian-Orthodox (Belgrade, Cetinje, Niš and Skopje), Muslim (Banja Luka and Sarajevo) and Roman-Catholic (Ljubljana, Novi Sad, Split and Zagreb).[33]

**Figure 3.2:** *Variance decomposition - variance between and within religious city-groups*




*Notes*: Calculation following the approach set out in Federico [2011, p. 125]
*Sources*: own calculation based on data from [Kraljevina Jugoslavija, 1932-1941] and [Ministarstvo poljoprivrede, 1924-1931].

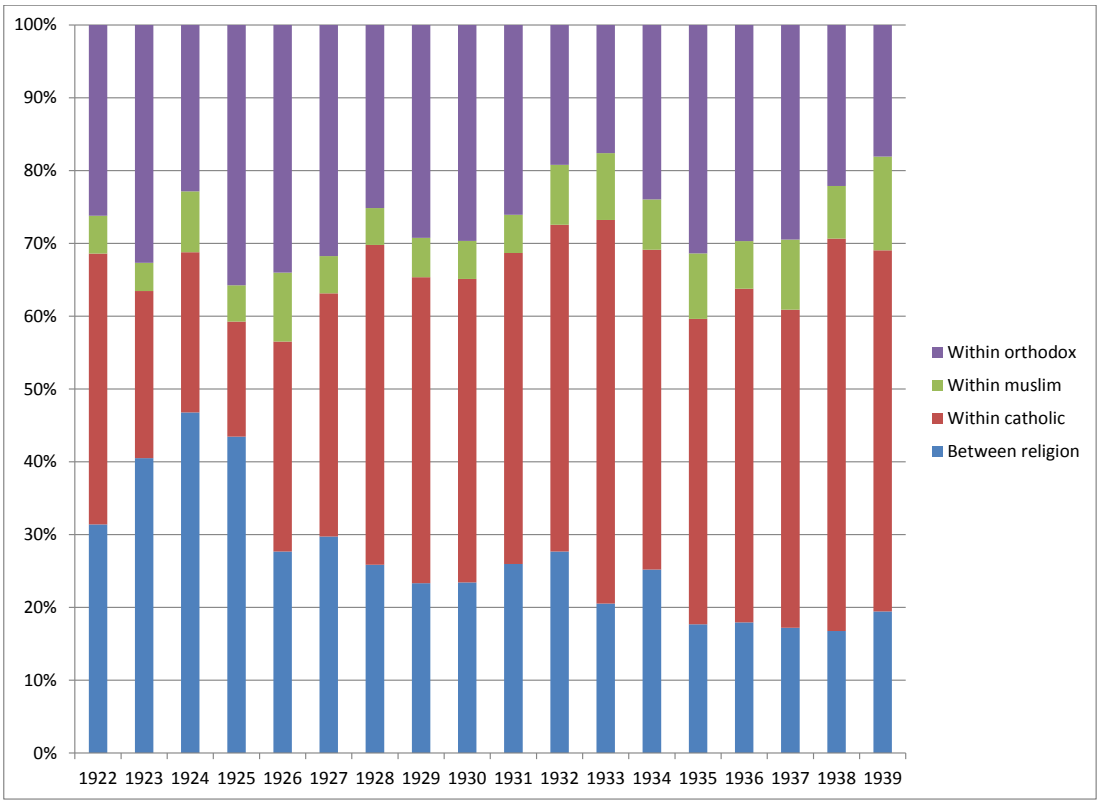
Following the approach set out in [Federico, 2011, p. 125] it is possible to distinguish variance between and within religious city-groups. Variance 'between religion' is the sum of squared differences (weighted by the number of cities in a religious group) between the

[33] Religious shares in each city are unweighted averages of the 1921 and 1931 values. Own calculations based on population censuses for the same years.

average price for each religious group and the Yugoslav average. Variance 'within religion' is the sum of variance within each religious group. In turn, the variance within a religious group is calculated as the sum of squared differences between the price for each city within the religious group and the average price for the religious group.

A decreasing share of within variance in total variance over time would suggest that many regional markets were in the making. On the contrary a decreasing share of between variance in total variance over time would indicate a move towards one national market. Figure 3.2 shows the decomposition of total variance into 'between religion' and 'within religion' components. Results show a development towards one Yugoslav market. Integration did not progress along ethno-religious lines as variance within religion increased over time.

**Figure 3.3:** *Variance decomposition - variance between and within religious city-groups, including religion-specific within variance*




*Notes*: Calculation following the approach set out in Federico [2011, p. 125]
*Sources*: own calculation based on data from [Kraljevina Jugoslavija, 1932-1941] and [Ministarstvo poljoprivrede, 1924-1931].

A further decomposition of within variance by religious group is shown in figure 3.3. The increase in 'within religion' variance over time was driven by an increase in variance within roman-catholic cities. Therefore, during the interwar period markets in Ljubljana, Novi Sad,

Split and Zagreb were becoming better integrated with markets from other Yugoslav cities then among themselves. Accordingly this development lowered the variance between religious city-groups.

## 3.3 Explaining commodity market integration until 1925 - historical interpretation

### 3.3.1. Removal of institutional barriers to market integration (1919-1925)

The early years of Yugoslavia were unique in that they provided an opportunity for removing institutional barriers to market integration via fiscal, monetary and transport system integration.

The first aspect of institutional integration was the dismantling of borders that were in place before the First World War and old tariff systems impeding domestic trade. In March 1919 the Customs Law[34] - which combined two previous laws applicable in the Kingdom of Serbia: State Customs Law (1899) and Law on the General Customs Tariff (1904) - was implemented for the whole of Yugoslavia, thereby placing all Yugoslav regions within a single customs union. In the coming years the validity of many other tariff laws was expanded towards the whole country (e.g. Customs-Postal Rule Book (1920), Law on State Excise, Taxes and Fees (1921), Customs-Maritime Rule Book (1925) [Ministarstvo finansija, 1939, p. 107]). In 1925 a new Law on the General Customs Tariff (with Import and Export Tariffs) was introduced. The main goal of the new tariff law was the protection of domestic production and not the unification of the tariffs as the latter was already achieved with the 1919 Customs Law and its multiple amendments which followed [Ministarstvo finansija, 1939, pp. 113-114].

At the onset of common life in the new Kingdom there were five systems of direct taxation which differed in their structure and level of development. Serbia had its pre-war law on indirect taxes in place; Montenegrin tax system was considerably undeveloped; Slovenia and Dalmatia had an Austrian tax system based on the yield of the tax object; Croatia-Slavonia and other former Transleithanian lands had a Hungarian tax system which was similar to

[34] Full name of which is Customs Law with the Law on the General Customs Tariff and All Trade Agreements of the Former Kingdom of Serbia.

the Austrian one, but also included a property tax; Bosnia-Herzegovina had many forms of taxes which were paid on the gross value of the tax object and not on its yield [Ministarstvo finansija, 1939, pp. 43-45]. The first Yugoslav constitution enacted on the 28 of June 1921 was a focal point for reforms of direct taxation as it stipulated regional tax equality (Article 116 of the Constitution) and provided a legal base for future tax laws [Ministarstvo finansija, 1939, p.46]. For example, several financial tax laws (e.g. Disability Tax (1921), Business Turnover Tax (1922) and the Temporary Tax on all Existing Indirect Taxes (1923)) passed in subsequent years applied to the whole Kingdom.

The second aspect of institutional integration was the establishment of a common currency and central bank. At the time of proclamation of Yugoslavia five different currencies were circulating in its territories - the Serbian dinar, the Austrian crown, Montenegrin perper, Bulgarian lev and the German mark. Moreover, the only bank of note issue in the new Yugoslav territories - the National Bank of Serbia - was operating out of Marseilles due to its First World War induced exile. It was the Ministry of Finance that conducted the preliminaries of monetary reform. Already in December 1918 exchange controls on foreign currency were introduced and earmarking of the Austrian crown was implemented [Ministarstvo finansija, 1939, pp. 214-215].[35] The National Bank of Serbia returned from Marseilles to Belgrade, in February 1919 and it was transformed into the National Bank of Serbs, Croats and Slovenes in January 1920. This institution was entrusted with issuing new dinar notes as well as converting old Austrian crowns into the new currency at the 4:1 Crown/Dinar exchange rate chosen by the government in January 1920 [Narodna Banka Kraljevine Jugoslavije, 1935, p. 142]. By June 1921 even Crown notes of small denomination were pulled out of circulation [Ministarstvo finansija, 1939, p. 220]. Currency integration was de jure complete by the end of 1922 as the new currency was the only legal currency even for accounting purposes [Narodna Banka Kraljevine Jugoslavije, 1935, p. 144].

The third aspect of institutional integration was the reconstruction of the war torn railway

[35]The Austrian Crown was the dominant currency according to the quantity in circulation which is not surprising given that the majority of the territories which consisted Yugoslavia were former parts of Austria-Hungary.

network and unification of the inherited transport systems. At its birth Yugoslavia had four separate railway systems characterised by varying regulations, transport tariffs, and levels of war induced destruction. These were railways in Serbia (Serbian State Railways including Orient Railways), railways in Croatia, Slavonia and Vojvodina, railways in Slovenia and railways in Bosnia and Herzegovina [Lampe, 1980, p. 139]. Fourteen different railway tariffs were recorded at the time, some of which were even written in German or Hungarian [Stefanović, 1929, p. 58]. The multitude of regulations continued in the early years of Yugoslavia as each regional directorate (Belgrade, Ljubljana, Sarajevo, Subotica, Zagreb) issued its own transport tariffs and distance tables [Cugmus, 1929, p. 224]. Only with the New Railway Transport Law[36] enacted on the 1st of October 1925, that made all the previous transport tariffs invalid, was 'tariff chaos' resolved [Cugmus, 1929, p. 225]. Several important railways were purchased by the state in the period around 1923. Most notably the Southern Railways and railways which belonged to the Orient Railway Society and Ottoman Society [Kraljevina Jugoslavija, 1932-1941]. While during the period from 1922 to 1939 the length of the railway network expanded by 1908 kilometers, almost a half of the increase came in 1924, the year in which Southern Railways became part of the state network. Thus already by the end of 1925 more than 60% of the railways built in the interwar period were already put in operation.[37]

In sum, common external tariffs were established starting with the 1919 Customs Law. The basis for all further laws was laid already by the first Yugoslav Constitution of 1921. By the end of the same year key features of monetary unification, i.e. creation of a common currency area and bank of note issue were achieved. Finally, railway transport tariffs and regulations systems were integrated and railway networks reconstructed by the end of 1925. The sharp fall in the variation of commodity prices across Yugoslavia that lasted until 1924 (cf. figure 3.1) goes well with the progress made in the integration of fiscal, monetary and transportation systems. These advances were conducive for domestic trade which in turn lowered commodity price differences across Yugoslavia.

[36] Alongside with New Railway Tariffs I and II, Local Tariffs A and B, and distance tables.
[37] Own calculations based on data from Statistical Yearbooks [Kraljevina Jugoslavija, 1932-1941].

## 3.4 Explaining commodity market integration 1926-1939 - empirical framework and econometric results

The basic idea behind the empirical framework employed in this section is to explain city-pair price deviations with a set of trade costs. Trade among markets is key to market integration as it allows the forces of arbitrage to close the gap between market prices until it equals transaction costs [Federico, 2012, p. 475]. Trade costs can be distinguished into those that are distance dependent (transport costs), network dependent (communication and community effects) and location-specific [Schulze and Wolf, 2012, p. 657]. Trade costs affecting trade within Yugoslavia are discussed before turning to econometric estimation.

### 3.4.1. Distance dependent trade costs

Distance affects market integration through its impact on domestic trade. All else equal, closer cities will have lower transport costs and will trade more with each other which in turn will lower their price differentials. Distance dependent trade costs are thus often measured by physical distances or real transport cost.

The vast majority of domestic trade was carried out using railways (see table 2.11). Out of all goods transported for the purpose of domestic trade railway transportation accounted for at least 78 per cent in each year during the period from 1925 to 1939 for which such data is available. River transportation ranged from seven to seventeen per cent during the same period, with the utilisation of this means of transport increasing in the 1930s. The share of sea transport remained below five per cent throughout the interwar.

Transport costs based on railways are used as proxies for distance dependent trade costs since railway transport was the dominant means of transporting goods intended for domestic trade. Railway transport tariff tables [Ministarstvo saobraćaja, 1925b, 1933b, 1938] allow the calculation of railway transport costs between each of the 45 city pairs.[38] To obtain real railway transport costs railway tariffs are divided by the general wholesale price index calculated by the National Bank of Yugoslavia with 1926 as the base year [Kraljevina Jugoslavija, 1932-1941].

[38] Nominal price in dinar for transporting 5000-10000 kg of wheat was taken as representative of railway transport costs.

**Table 3.3:** *City-pair railway distance (km) matrix for 1925, including changes from 1925 to 1935*

| 1925 | Banja Luka | Belgrade | Cetinje | Ljubljana | Niš | Novi Sad | Sarajevo | Skopje | Split | Zagreb |
|---|---|---|---|---|---|---|---|---|---|---|
| Banja Luka | | | | | | | | | | |
| Belgrade | 500 (-7) | | | | | | | | | |
| Cetinje | 911 | 807 | | | | | | | | |
| Ljubljana | 351 | 575 (-5) | 988 | | | | | | | |
| Nis | 748 | 248 | 820 | 823 (-5) | | | | | | |
| Novi Sad | 485 (-30) | **83** (-7) | 827 | 560 (-35) | 331 | | | | | |
| Sarajevo | 548 | 499 (-55) | 363 | 623 | 456 | 495 (-30) | | | | |
| Skopje | 963 (-11) | 463 (-11) | 929 | 1038 (-16) | 215 | 546 (-11) | 671 (-104) | | | |
| Split | 648 (-13) | 872 (-20) | 1270 | 546 (-12) | 1120 (-20) | 857 (-50) | 920 (-13) | **1335** (-31) | | |
| Zagreb | 211 | 435 (-7) | 846 | 140 | 683 (-7) | 420 (-37) | 483 | 898 (-18) | 437 (-13) | |

*Notes:* The most and least close city-pairs are bolded.
*Sources:* Own calculation based on data from [Ministarstvo saobraćaja, 1925a, 1930, 1933a, 1935, 1937]

Railway distances are used as an additional control. Table 3.3 shows the city-pair railway distance matrix for cities i and j expressed in km, for the year 1925, including changes from 1925 to 1935 (the earliest and latest interwar years for which distance tables are available). The two closest cities were Belgrade and Novi Sad. In 1925 they were 83 km apart via railway, while in 1935 they were seven kilometers closer. The two furthest cities were Split and Skopje divided by 1335 km of railway track in 1925 and 31 km less in 1935. Over time 25 of the 45 city-pairs became closer. However, the average distance between all city-pairs decreased from approximately 644 km to 631 km from 1925 to 1935.

### 3.4.2. Network dependent costs

Network dependent costs can be decomposed into community and communication effects. Community effects may have been an important impediment to commodity market integration. Preference for within community trade may have increased transaction costs for between community trade hence increasing the price difference between city-pairs comprised of differing communities. As argued in the previous section, in Yugoslavia ethnic communities were most easily associated with religious affiliation [Čalić, 2013, pp.138-139]. Thus using data on religious affiliation allows us to separate large ethnic groups (e.g. Serbs from Slovenians and Croats, as well as Bosnians) as well as other minorities, on a city-specific level.

Following the logic of Schulze and Wolf [2012] for each city-pair we calculate religious matching probabilities, which vary between 0 (no similarity between cities $i$ and $j$) and 1 (no differences) as:

$$religion_{ij,t} = \sum_{r=1}^{5} (a_{i,t}^{r} * a_{j,t}^{r}) \tag{12}$$

where $a_{i,t}^{r}$ is the per cent share of religion $r$ in city $i$ at time $t$ and $a_{j,t}^{r}$ is the per cent share of religion $r$ in city $j$ at time $t$.[39] For example, if city i was comprised only of Catholics and city j only of Muslims our indicator would equal 0. On the contrary, if both cities i and j were comprised only of say Catholics our indicator would equal 1. It is important to realise that if

[39]The five religions are: Christian-Orthodox, Jewish, Roman-Catholic, Muslim and other.

both cities i and j had a composition which was 50% Catholic and 50% Muslim, our indicator would equal 0.5. Thus the idea behind the indicator is to capture the matching probability of the same religion for a given city-pair and not necessarily the similarity of the religious composition between a given city-pair.[40]

Table 3.4 shows the results of the exercise for 45 city-pairs for the year 1921, including changes from 1921 to 1931 (the earliest and latest interwar years for which censuses on religion were taken) that were larger than one per cent. In 1921 the highest religious matching probability was between Split and Ljubljana (0.91), while the lowest was between Split and Skopje (0.04). Thus there was extensive variation in the cross-section of city-pairs. The average religious matching probability between all city-pairs increased from circa 0.32 to 0.335 from 1921 to 1931.

As one language was dominantly spoken in interwar Yugoslavia communication costs are expected to be low and have little bearing on commodity market integration. According to the 1921 census [Kraljevina Jugoslavija, 1932] the Serbo-Croatian language was the mother tongue of circa 74% of the population. Around 83% of the population and 82% of the people living in the ten sample cities had a mother tongue that was either Serbo-Croatian or Slovenian. A non-South Slavic language captured a considerable share only in Novi Sad (Hungarian 33%) and in Skopje (Turkish 34%). Serbo-Croatian was however taught in schools across Yugoslavia as early as 1921 [Wachtel, 1998, p. 89] thus providing younger generations of foreign minorities a *ligua franca* with the majority of the population.

Language matching probabilities can be calculated using the same approach as for religious matching probabilities:

$$language_{ij} = \sum_{l=1}^{3} (a_i^l * a_j^l) \tag{13}$$

where $a_i^l$ is the per cent share of language $l$ in city $i$ in 1921 and $a_j^l$ is the per cent share of language $l$ in city $j$ in 1921.[41] On average, cities across Yugoslavia had higher language

[40] Note that even though in the second and the third example above cities i and j are equal in their religious composition, in the latter example our indicator results in a lower matching probability.

[41] The three languages are: Serbo-Croatian, Slovenian, and other.

**Table 3.4:** *City-pair religious matching probability matrix for 1921, including changes from 1921 to 1931*

| 1921 | Banja Luka | Belgrade | Cetinje | Ljubljana | Niš | Novi Sad | Sarajevo | Skopje | Split | Zagreb |
|---|---|---|---|---|---|---|---|---|---|---|
| Banja Luka | | | | | | | | | | |
| Belgrade | 0.28 (0.01) | | | | | | | | | |
| Cetinje | 0.30 | 0.76 (-0.04) | | | | | | | | |
| Ljubljana | 0.26 (0.03) | 0.12 (0.06) | 0.09 (0.02) | | | | | | | |
| Nis | 0.30 (0.01) | 0.73 (-0.05) | 0.77 | 0.08 (0.01) | | | | | | |
| Novi Sad | 0.22 (0.03) | 0.36 (0.02) | 0.37 (0.03) | 0.39 (0.04) | 0.35 (0.02) | | | | | |
| Sarajevo | 0.29 | 0.25 | 0.26 (-0.01) | 0.29 (-0.02) | 0.25 | 0.22 | | | | |
| Skopje | 0.32 | 0.47 (0.01) | 0.50 (0.04) | 0.04 (0.03) | 0.49 (0.04) | 0.23 (0.04) | 0.28 | | | |
| Split | 0.26 (0.03) | 0.11 (0.07) | 0.09 (0.03) | **0.91** (-0.01) | 0.08 (0.02) | 0.39 (0.04) | 0.29 (-0.2) | **0.04** (0.03) | | |
| Zagreb | 0.25 (0.03) | 0.15 (0.04) | 0.13 | 0.81 (0.01) | 0.12 | 0.37 (0.04) | 0.28 (-0.01) | 0.07 (0.02) | 0.82 | |

*Notes:* The most and least similar city-pairs are bolded.
*Sources:* Own calculation based on data from the 1921 and 1931 population censuses [Kraljevina Jugoslavija, 1932, 1938a].

matching probabilities (0.54) than religious matching probabilities (0.32 in 1921 and 0.335 in 1931).

### 3.4.3. Location specific trade costs

Trade costs may differ across locations due to time-invariant city specific characteristics. For example, geographical features such as access to sea or navigable rivers may provide an advantage which cities could exploit in order to lower transaction costs when engaging in domestic trade. From the ten cities in our sample, only Split was located on the sea. However, throughout the interwar the largest share of domestic trade via sea went through the port in Split [Kraljevina Jugoslavija, 1932-1941]. While Split could not trade directly via sea with other cities in our sample a mix of sea and land transport was possible for some cities located close to the Adriatic coastline. Most notably, the city of Cetinje was close to the port of Kotor. Apart from having sea access Yugoslavia was abundant in rivers. However very few of them were navigable. Though connecting Ljubljana, Zagreb and Belgrade, the Sava river would become navigable only halfway through Belgrade [Lampe, 2000, pp. 13-14]. The only relevant navigable river connection worth mentioning in our context is the link between Belgrade and Novi Sad via the Danube. Accordingly, throughout the interwar, the bulk of domestic trade via rivers occurred through the river docks of Belgrade and Novi Sad [Kraljevina Jugoslavija, 1932-1941]. In sum, apart from being connected via railways (the dominant means of goods transport in Yugoslavia) some cities in our sample could have used their geographical advantage and traded via sea or rivers. To account for these fixed differences between cities we use city specific fixed effects.

### 3.4.4. Econometric estimation

The baseline estimating equation can be written as:

$$|ln(p^k_{i,t}) - ln(p^k_{j,t})| = \alpha + \beta ln realtranscosts_{ij,t} + \gamma religion_{ij,t} + \delta_j city_j + \zeta_k commodity_k + \epsilon_{ij,t} \quad (14)$$

where: $k \in [1,\ 19]$, $t \in [1,\ 14]$, $i \in [1,\ 10]$, and $i > j$; the variable to be explained,

$|ln(p^k_{i,t}) - ln(p^k_{j,t})|$, is calculated by taking the absolute value of city-pair (i,j) log price deviations of commodity $k$, at time $t$; $realtranscosts_{ij,t}$ are real costs of transporting wheat between city-pairs (i,j) via railways approximating transport costs at time $t$; $religion_{ij,t}$ are city-pair (i,j) religious matching probabilities estimating community costs at time $t$; $city_j$ is a time-invariant set of dummy variables over $j$ cities capturing unobservable city-specific trade costs; $commodity_k$ is a time-invariant set of dummy variables over $k$ commodities capturing unobservable commodity-specific trade costs; $\alpha$ is the constant and $\epsilon_{ij,t}$ is the error term. The estimated coefficient on the realtranscost variable is expected to be positively signed as higher transport costs should be associated with higher price deviations. There is no strong expectation on the sign of the estimated coefficient on the religion variable - community effects could have been positive or negative.

Table 3.5 shows the baseline results. Model 1 estimates the baseline regression (equation 14). Models 2 to 4 add in a step-wise manner controls for ethno-linguistic diversity (language variable) and railway distances (raildistance varaible).[42] Models 1 to 4 are estimated using pooled OLS, with city and commodity-specific fixed effects, and standard errors clustered over city-pairs. All models use the full sample of 11970 observations (19 commodities times 14 years times 45 city-pairs). The share of explained variation stays around 0.24 across all models.

The econometric results clearly suggest that real transport costs were an important factor driving city-pair commodity market integration. Models 1 to 4 unanimously report real transport costs as highly statistically significant and positively associated with city-pair price differentials. According to the baseline model a one per cent decrease in real transport costs decreases city-pair price differentials by a third evaluated at the mean of 0.2011. Railway distances are found to be a poor predictor of city-pair price differentials. The finding that transport costs mattered is in line with the long-standing literature arguing for the importance of transport costs for market integration [Engel and Rogers, 1996]. In particular railway transport costs were important as in the case of interwar USA [Federico and Sharp, 2013].

[42] $language_{ij}$ are city-pair (i,j) language matching probabilities controlling for communication costs. $raildistance_{ij,t}$ are city-pair (i,j) railway distances in kilometers at time $t$.

**Table 3.5:** *Modeling Yugoslav commodity market integration 1926-1939*

| Dependent variable $\lvert ln(p^k_{i,t}) - ln(p^k_{j,t})\rvert$ | Model 1 full sample | Model 2 full sample | Model 3 full sample | Model 4 full sample |
|---|---|---|---|---|
| ln realtranscosts | 0.0671*** | 0.0668*** | 0.0509** | 0.0512** |
| | (0.002) | (0.003) | (0.019) | (0.019) |
| religion | 0.0002 | 0.0003 | 0.0058 | 0.0058 |
| | (0.994) | (0.990) | (0.823) | (0.827) |
| language | | 0.0214 | | 0.0186 |
| | | (0.740) | | (0.773) |
| ln raildistance | | | 0.0095 | 0.0092 |
| | | | (0.509) | (0.533) |
| City FE | YES | YES | YES | YES |
| Commodity FE | YES | YES | YES | YES |
| Observations | 11970 | 11970 | 11970 | 11970 |
| $R^2$ | 0.243 | 0.243 | 0.243 | 0.243 |

*Notes:* Pooled OLS, with city and commodity-specific fixed effects; all models are estimated with a constant; SE clustered over city-pairs; $k \in [1, 19]$, $t \in [1, 14]$, $i \in [1, 10]$ and $i > j$; *** and ** denote statistical significance at the 1 and 5 per cent level respectively; $p$-values in parentheses.

The extent of religious matching of city-pairs was irrelevant for market integration. The same was true for the extent of language matching of city-pairs. Hence, cultural differences were not an impediment to commodity market integration in Yugoslavia. Econometric results are in line with the variance decomposition analysis shown in section 3.2.2. The Yugoslav case however differs from the late Austro-Hungarian Empire where ethno-linguistic matching probability was an important driver of market integration [Schulze and Wolf, 2012].

### 3.4.5. Robustness checks

Price differentials between markets measure trade costs only if these market trade with each other. Otherwise, prices may be equal by chance or differentials might be smaller than trade costs and in this case the pairwise analysis of market integration would yield biased results [Federico, 2012, p. 478]. Checking whether there was trade between the 45 city-pairs is not possible since there is no data on trade within Yugoslavia. It is, however, worth exploring the robustness of the baseline results to the selection of only close-by markets.

Table 3.6 shows the results of estimating models 1 to 4 from table 3.5 while conditioning the sample of observations on minimizing the distance between city-pairs and maximizing

**Table 3.6:** *Robustness check: sample conditional on city-pair proximity*

| Dependent variable $\lvert ln(p^k_{i,t}) - ln(p^k_{j,t})\rvert$ | Model 1 restricted | Model 2 restricted | Model 3 restricted | Model 4 restricted |
|---|---|---|---|---|
| ln realtranscosts | 0.0964** | 0.0890* | 0.0866* | 0.0894* |
| | (0.028) | (0.088) | (0.097) | (0.086) |
| religion | -0.0261 | -0.0223 | -0.0161 | 0.1108 |
| | (0.505) | (0.594) | (0.742) | (0.470) |
| language | | -0.0849 | | 2.9167 |
| | | (0.797) | | (0.389) |
| ln raildistance | | | 0.0048 | 0.1282 |
| | | | (0.732) | (0.372) |
| City FE | YES | YES | YES | YES |
| Commodity FE | YES | YES | YES | YES |
| Observations | 2755 | 2755 | 2755 | 2755 |
| $R^2$ | 0.220 | 0.220 | 0.220 | 0.221 |

*Notes:* Pooled OLS, with city and commodity-specific fixed effects; all models are estimated with a constant; robust SE ; $k \in [1, 19]$, $t \in [1, 5]$, city-pair $i,j \in [1, 11]$ for 1926-1930 and $k \in [1, 19]$, $t \in [6, 14]$, city-pair $i,j \in [1, 10]$ for 1931-1939; ** and * denote statistical significance at the 5 and 10 per cent level respectively; $p$-values in parentheses.

the number of included city-pairs. The rationale is to concentrate on close-by city-pairs that have the highest chance of trading while still having each of the ten cities in the sample. The restricted sample has 2755 observations (sum of 19 commodities times 11 city-pairs times the first 5 years and 19 commodities times 10 city-pairs times the remaining 9 years). The results are in line with the baseline estimation. Real transport costs are estimated as statistically significant and with the expected positive sign. The effect of real transport costs is slightly higher in the restricted sample (one per cent decrease in realtranscosts decreases city-pair price differentials by about a half evaluated at the mean of 0.1921).

As a further robustness check and to fully exploit the commodity dimension of the data set it is possible to explore the differential effect of real transport costs and religion on individual commodities. The results are reported in table 3.7. Model 1 includes the religion variable as well as interaction terms between the product dummy variable and the variable capturing real transport costs. Model 2 includes the real transport costs variable as well as interaction terms between the product dummy variable and the religion variable. Both models include city and commodity-specific fixed effects and use the full sample of observations. Model 1 shows that

real transport costs are estimated as statistically significant and correctly signed in seven out of 19 markets. Thus the statistically significant and positively signed effect of real transport costs in the baseline estimation is confirmed on a number of different commodity markets. On the contrary there are only two instances in which the coefficient on religion is statistically significant. This is insufficient evidence for the religion variable to be considered as statistically significant in general. The statistical significance of the religion and lard interaction may be explained with the dietary preferences of the muslim population.

**Table 3.7:** *Robustness check: differential effects of real transport costs and religion on individual commodities*

| Dependent variable $\lvert ln(p^k_{i,t}) - ln(p^k_{j,t})\rvert$ | Model 1 full sample | Model 2 full sample |
|---|---|---|
| ln realtranscosts | | 0.0671*** |
| | | (0.002) |
| religion | 0.0002 | |
| | (0.994) | |
| ln realtranscosts x wheat flour | 0.1245** | |
| | (0.014) | |
| ln realtranscosts x corn flour | 0.1590** | |
| | (0.026) | |
| ln realtranscosts x white bread | 0.1116** | |
| | (0.036) | |
| ln realtranscosts x rice | 0.1687*** | |
| | (0.001) | |
| ln realtranscosts x mutton | -0.1570* | |
| | (0.058) | |
| ln realtranscosts x cheese | 0.3296* | |
| | (0.051) | |
| ln realtranscosts x eggs | 0.1517*** | |
| | (0.003) | |
| ln realtranscosts x soap | 0.2026*** | |
| | (0.001) | |
| religion x wheat flour | | 0.0850* |
| | | (0.067) |
| religion x lard | | 0.536* |
| | | (0.097) |
| City FE | YES | YES |
| Commodity FE | YES | YES |
| Observations | 11970 | 11970 |
| $R^2$ | 0.253 | 0.246 |

*Notes:* Pooled OLS, with city and commodity-specific fixed effects; both models are estimated with a constant; statistically insignificant interaction terms not reported; SE clustered over city-pairs; $k \in [1, 19]$, $t \in [1, 14]$, $i \in [1, 10]$ and $i > j$; ***, **, * denotes statistical significance at the 1, 5 and 10 per cent level respectively; $p$-values in parentheses.

## 3.5 Summary and conclusion

The research presented in the present chapter provides pioneering empirical analysis of market integration in interwar Yugoslavia. The analysis tests the first condition of the Law of One Price by measuring the extent of commodity price dispersion observed over a set of ten Yugoslav cities during the period from 1922 to 1939. How far did commodity market integration in Yugoslavia progress during the interwar period? Overall, commodity market integration increased during the interwar period. The coefficient of variation decreased from around 0.24 in 1922 to 0.16 in 1939 and the decrease was statistically significant.

The novel data set allowed exploring market integration along the commodity and regional dimensions. The main finding from the commodity dimension is that prices of grain and grain derivatives provide a lower bound estimate of the coefficient of variation and thus overstate overall commodity market integration. The regional dimension revealed a decrease of variance between religion based city-groups. The increase in within religion variation can be explained by Roman-Catholic cities becoming better integrated with other Yugoslav cities over time. Thus variance decomposition analysis suggests that Yugoslav market integration progressed towards one national market.

Which factors help explain market integration? A historical narrative shows that the swift progress of commodity market integration in the early years of interwar Yugoslavia can be attributed to the advancement in institutional integration. Unification of fiscal, monetary and transportation systems lowered transaction costs and was conducive for market integration. For the period from 1926 to 1939 commodity price differences between 45 city-pairs are modeled with a set of trade cost. The econometric results show that real transport costs help explain market integration, while community costs do not.

The findings offer support to the long-standing literature stressing the importance of transport costs for market integration [Engel and Rogers, 1996] and especially railway transports costs [Federico and Sharp, 2013]. Unlike in late nineteenth century Austria-Hungary [Schulze and Wolf, 2012] community costs did not affect market integration in interwar Yugoslavia. Contrasting results in the cases of Austria-Hungary and Yugoslavia can perhaps be explained

by the difference in the two historical settings. In the late nineteenth century Austria-Hungary was an Empire at its demise while interwar Yugoslavia was a newborn country. Yugoslavia brought together multiple South Slavic ethnicities under a common border - an idea reaching back to the nineteenth century and the South Slavic movement [Čalić, 2013].

This result has implications for the historical discussion on long-run viability of Yugoslavia. The position often taken in political historiography is that diversity was incompatible with integration in the long-run. The present chapter finds that Yugoslavia set out on a process of economic integration that was not hampered by its unique diversity. From an economic history point of view the break-up of Yugoslavia was hardly predictable in 1939.

Finally, the results for interwar Yugoslavia show that domestic market integration progressed at the European periphery during the interwar. This is in line with the recent results for interwar Germany [Wolf, 2009] which show increased domestic market integration in the core of Europe. Therefore, an interesting avenue for future research would be to investigate the relationship between international market disintegration and domestic market integration in the interwar period.

## 3.6 Appendix C - Data Appendix

**Table 3.8:** *Data for figure 3.1*

| year | cv_between | cv_between2 |
|---|---|---|
| 1922 | | 0.24 |
| 1923 | | 0.20 |
| 1924 | | 0.18 |
| 1925 | | 0.24 |
| 1926 | 0.18 | 0.21 |
| 1927 | 0.15 | 0.18 |
| 1928 | 0.17 | 0.17 |
| 1929 | 0.16 | 0.18 |
| 1930 | 0.20 | 0.23 |
| 1931 | 0.19 | 0.22 |
| 1932 | 0.17 | 0.19 |
| 1933 | 0.18 | 0.20 |
| 1934 | 0.19 | 0.20 |
| 1935 | 0.18 | 0.19 |
| 1936 | 0.17 | 0.18 |
| 1937 | 0.15 | 0.15 |
| 1938 | 0.15 | 0.16 |
| 1939 | 0.15 | 0.16 |

*Sources:* See text.

**Table 3.9:** *Data for figures 3.2 and 3.3*

| year | between | within | within_catholic | within_muslim | within_orthodox |
|---|---|---|---|---|---|
| 1922 | 0.31 | 0.69 | 0.37 | 0.05 | 0.26 |
| 1923 | 0.41 | 0.59 | 0.23 | 0.04 | 0.33 |
| 1924 | 0.47 | 0.53 | 0.22 | 0.08 | 0.23 |
| 1925 | 0.43 | 0.57 | 0.16 | 0.05 | 0.36 |
| 1926 | 0.28 | 0.72 | 0.29 | 0.09 | 0.34 |
| 1927 | 0.30 | 0.70 | 0.33 | 0.05 | 0.32 |
| 1928 | 0.26 | 0.74 | 0.44 | 0.05 | 0.25 |
| 1929 | 0.23 | 0.77 | 0.42 | 0.05 | 0.29 |
| 1930 | 0.23 | 0.77 | 0.42 | 0.05 | 0.30 |
| 1931 | 0.26 | 0.74 | 0.43 | 0.05 | 0.26 |
| 1932 | 0.28 | 0.72 | 0.45 | 0.08 | 0.19 |
| 1933 | 0.21 | 0.79 | 0.53 | 0.09 | 0.18 |
| 1934 | 0.25 | 0.75 | 0.44 | 0.07 | 0.24 |
| 1935 | 0.18 | 0.82 | 0.42 | 0.09 | 0.31 |
| 1936 | 0.18 | 0.82 | 0.46 | 0.07 | 0.30 |
| 1937 | 0.17 | 0.83 | 0.44 | 0.10 | 0.29 |
| 1938 | 0.17 | 0.83 | 0.54 | 0.07 | 0.22 |
| 1939 | 0.19 | 0.81 | 0.50 | 0.13 | 0.18 |

*Sources:* See text.

# 4 | Financial Crises in Eastern Europe in 1931


## Abstract

Did Eastern European countries experience financial crises during 1931? If so, what were the main factors contributing to these crises? Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia were hit by currency, banking and sovereign default risk crises during 1931, while Czechoslovakia was troubled only by a currency crisis. Worsening of domestic fundamentals, drying up of international credit and falling global demand, as well as finance and trade spillovers all played a contributing role. While completely avoiding financial crises during 1931 was elusive for Eastern Europe, the case of Czechoslovakia shows that strong economic fundamentals helped downsize the extent of financial crises.


## 4.1 Introduction

The European Financial Crisis of 1931 is a crucial event in financial history as it deepened and internationalised the Great Depression. It is most often associated with financial crises that occurred in large developed European economies such as Austria, Germany, and Britain [Eichengreen, 1992, Kindleberger, 1986]. Recently there has been revived interest in the European Financial Crisis of 1931 and its international implications. Accominotti [2012] argued that the imposition of exchange control in Central Europe had negative effects on British merchant banks that were exposed to the region, which in turn contributed to Britain leaving the gold standard. Ritschl and Sarferaz [2014] analysed potential crisis transmission channels between Germany and the US and found spillover effects through banking linkages running from Germany to the US.

However, modern English-language literature lacks a study documenting financial crises in Eastern Europe in 1931. Moreover, the channels and mechanisms through which financial crises may have spread internationally to Eastern Europe are still largely unknown. For example, while Kindleberger [1986] is often cited for acknowledging crisis transmission from Austria to a number of Eastern European countries, he does so only in passing.[43] Similarly,

[43] Kindleberger [1986, p. 148]: 'At the end of May 1931, Austrian financial difficulties ramified widely and

Eichengreen [1992, p. 270] briefly mentions that 'Austria's crisis spread immediately to Hungary', presumably since the two countries' banking systems were interconnected. The underexplored state of research on this topic was recently highlighted by Eichengreen [2011, pp. 36-37] who suggested that the 'main victims' of the 1931 financial crisis may have been Central European emerging markets rather than advanced countries.

The present chapter aims to fill this gap in the literature. We ask two closely related questions. Did Central-Eastern and South-Eastern European (CESEE) countries experience financial crises during 1931? If so, what factors contributed to these financial crises?[44] We analyse all CESEE countries with a population over two million, that were relatively well documented in historical sources and had a market economy.[45] Thus our sample of countries includes Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia (henceforth also referred to as the 'CESEE-7'). In line with previous research [Eichengreen, 1992, Kindleberger, 1986] we take financial crises in Austria, Germany and Britain - occurring in May, July and September 1931, respectively - as exogenous to the CESEE-7. Our main period of interest during 1931 is from the Austrian financial crisis until the introduction of exchange controls in most of the CESEE-7 shortly after Britain's exit from the gold standard.

The chapter is structured as follows. We first take stock of currency, banking and sovereign default risk crises in the CESEE-7 during 1931 (section 4.2). Then we explore how global shocks and macroeconomic fundamentals as well as international financial crisis transmission could have contributed to financial crises in the CESEE-7 during 1931 (section 4.3). In the final section we summarise and conclude.

---

led to runs on the banks of Hungary, Czechoslovakia, Romania, Poland, and Germany'.

[44]The term 'financial crisis', as used in the present chapter, refers to the occurrence of a currency, banking or sovereign default risk crisis in a given country. The plural form of the term is used either when a single country is experiencing several financial crises simultaneously (e.g. currency and banking crises i.e. twin crisis) or when multiple countries are hit by one or more financial crises.

[45]Our sample does not include Albania or the Baltic countries as these were small countries (Lithuania - the most populous country from the group - had around 2.1 million inhabitants in 1920 [Kirk, 1969, p.24]) for which relatively limited evidence is available. We do not include Soviet Russia as it had a controlled economy.

## 4.2 Documenting financial crises in CESEE during 1931

The experience of Austria, Germany and Britain during the European Financial Crisis of 1931 has been researched extensively.[46] Table 4.1 presents a time-line of main events pertaining to the financial crises in these three countries during 1931. The Austrian financial crisis in May 1931 was the first in a series of financial crises hitting Europe during 1931. Namely, on 8 May it was revealed that the losses of the Creditanstalt - the largest European deposit bank east of Germany [Schubert, 1991, p.3] - exceeded the amount of its original capital, and that it needed to be bailed out by the Austrian government [Ellis, 1939, p. 27]. The first in a series of bailouts was advanced on 14 May by the Austrian government, Austrian National Bank and the House of Rothschild (see [Ellis, 1941, p.28] and [Kindleberger, 1986, pp. 145-146]).

**Table 4.1:** *Time-line: European Financial Crisis of 1931 in Austria, Germany and Britain*

| Date | Event |
|---|---|
| 8 May | Creditanstalt's losses revealed to the public |
| 14 May | Initial bailout of the Creditanstalt |
| 6 June | German government states it could no longer pay reparations |
| 6 June | Run on German currency |
| 20 June | US president Hoover announced one year moratorium on war debts |
| 1 July | Extent of Nordwolle losses revealed to the public |
| 13 July | German Danat Bank fails |
| 14 and 15 July | Banking holiday in Germany |
| 15 July - 1 Aug. | Series of exchange control decrees in Germany |
| 15 July - 1 Aug. | Run on British currency |
| 21 September | Britain officially suspends gold standard and devalues its currency |

*Sources:* See text.

The Austrian Crisis was followed by the German financial crisis. First, on 6 June the German government issued a statement that it could no longer pay reparations (see [James, 1984, p. 71] and [Kindleberger, 1986, p. 149]). In the same week a run on the German currency started [Ferguson and Temin, 2003, p. 30]. A one year moratorium on all international political debt was announced on 20 June by US president Hoover. The full extent of losses of the Nordwolle (Norddeutsche Wollkammerei) was revealed in the beginning of July [Schnabel, 2004, p. 852]. The Nordwolle failure brought down Danatbank (Darmstädter und Nationalbank) and

[46] See for example Ellis [1941], Williams [1963a,b], James [1984], Kindleberger [1986], Schubert [1991], Eichengreen [1992], Balderston [1994], Ferguson and Temin [2003], Schnabel [2004], Temin [2008], Accominotti [2012] and Ritschl and Sarferaz [2014].

other large German banks including Dresdner Bank [Ferguson and Temin, 2003, p. 22]. The German financial crisis culminated on 13 July when Danatbank failed and a 'banking holiday' taking effect the following day was proclaimed by government decree [League of Nations, 1934a, p. 112]. Exchange control was introduced by a series of decrees between 15 July and 1 August [Ellis, 1940, p. 9] which meant that Germany had left the gold standard.

In effect, exchange controls implied a ban on all payments abroad meaning that debtors had to find new arrangements with foreign creditors [Accominotti, 2012, p. 5]. An international conference held in London (20-23 July) recommended a freezing of foreign credits in Germany. Accordingly, Germany concluded Standstill Agreements with major creditor states in August and September (see [James, 1984, p. 82] and [Accominotti, 2012, p. 5]). The Standstill resulted in a run on British merchant banks which were heavily exposed to Central European acceptances [Accominotti, 2012, pp. 22-23]. Moreover, just after the peak of the financial crisis in Germany there began a run on the British currency - in the two weeks following 15 July the Bank of England lost about 20 per cent of its gold reserves, despite raising its discount rate twice in this short period [Accominotti, 2012]. Eventually, Britain officially suspended its commitment to the gold standard and devalued its currency in relation to gold on 21 September [League of Nations, 1934b, p. 206].

How do Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia (the CESEE-7) fit into this time-line? Did the CESEE-7 also experience financial crises during 1931? In what follows we explore three types of financial crises in these countries - currency, banking and sovereign default risk crises.

### 4.2.1. Currency crises

In times when flexible exchange rates are the dominant currency regime, currency crises are most intuitively understood as large changes in a country's exchange rate. However, in times of fixed exchange rates, such as the interwar gold-exchange standard, a record of minor exchange rate fluctuations may mask severe pressure on the exchange rate that is forcing the central bank to alter its interest rate or intervene in the foreign exchange market. This has led some

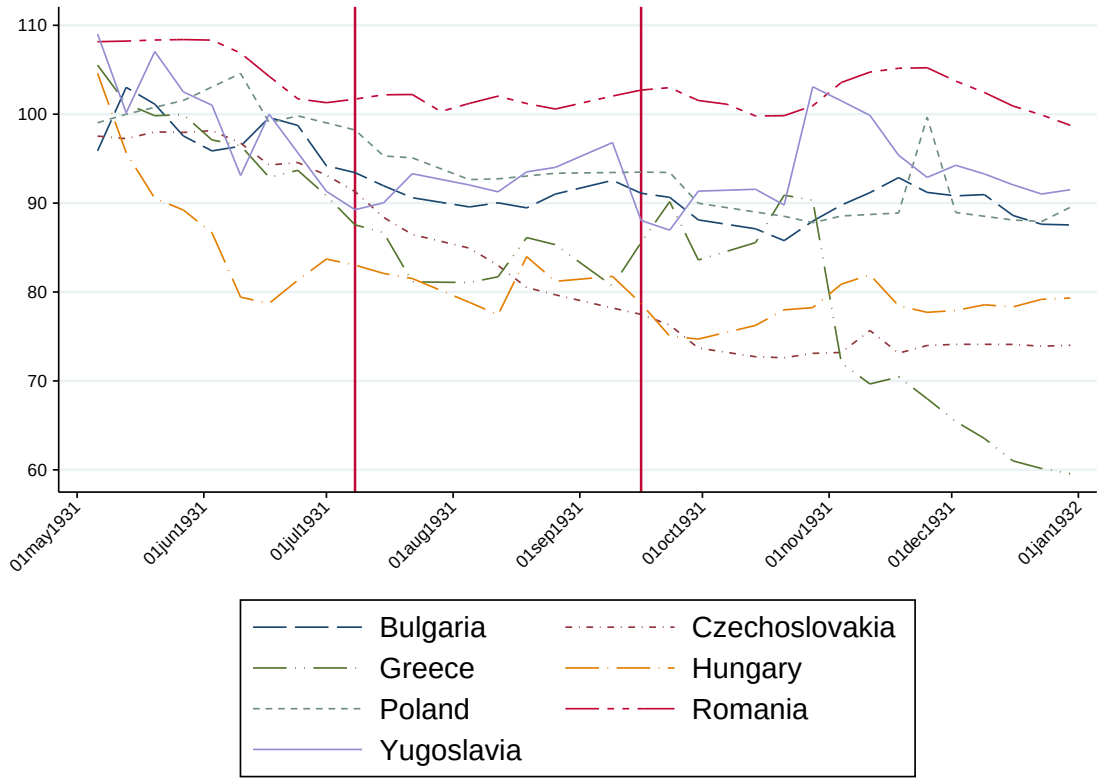
authors [Eichengreen and Rose, 1999, Eichengreen et al., 1996] to rely on an exchange market pressure index [Girton and Roper, 1977] - a weighted average of changes in the exchange rate, central bank foreign reserves and interest rates. Nevertheless, the application of such an index to interwar CESEE is questionable based on the grounds that central banks in the region seldom changed their interest rates,[47] while exchange rates – once de facto stabilised – fluctuated little [League of Nations, 1932e, SEEMHN, 2014]. Therefore, to gauge potential pressures on CESEE exchange rates, we find it most instructive to investigate central bank foreign reserves in these countries. Changes in foreign reserves may indicate whether a central bank committed to a fixed exchange rate was forced to expend gold and foreign exchange reserves on the purchase of domestic currency when faced with a looming currency crisis [Eichengreen, 1992, p. 262].

What is the track record of currency crisis in the CESEE-7 following the onset of the European Financial Crisis of 1931? Figure 4.1 shows weekly values of central bank gold and foreign exchange reserves (henceforth reserves) relative to the average value for April, for a period starting in the first week of May and lasting to the end of 1931, for seven CESEE countries.

Relative to the April average, Hungary lost around 13 per cent and Bulgaria circa 4 per cent of reserves by the first week of June. Changes of reserves in other countries were more modest in this period. By the second week of July and the culmination of the financial crisis in Germany, the CESEE-7 lost considerable portions of their reserves. The loses ranged from almost 5 per cent in Poland to 18 per cent in Hungary. On 17 July Hungary decided to invoke exchange controls [Ellis, 1939, pp. 88-89]. However reserve losses continued in Hungary as well as in other CESEE countries. By the second week of September i.e. the week preceding Britain's exit from gold, reserves in Bulgaria, Czechoslovakia, Greece, Hungary, Poland and Yugoslavia were lower than at the time of the German financial crisis. During the months of September and October Bulgaria, Czechoslovakia, Greece, and Yugoslavia all introduced

[47] In the months of May, June, July, and August, from the six CESEE countries in our sample only the National Bank of Yugoslavia changed its interest rate [SEEMHN, 2014, Statistisches Reichsamt, 1936] - on 29 June, after going de jure on gold and on 20 July following the financial crisis in Germany.

**Figure 4.1:** *Central bank (gold and foreign exchange) reserves of seven CESEE countries (7 May to 31 December 1931, weekly frequency, April value = 100)*




*Notes:* The two (red) vertical lines denote the second week of July (German financial crisis) and the second week of September (the week before Britain's exit from the gold standard), respectively.
*Sources:* Own calculations based on data from The Economist [1931].

exchange controls [League of Nations, 1940, pp. 194-195, Table 101] in an effort to stop the drain on reserves and defend fixed exchange rates [Ellis, 1941, pp. 878–879]. Romania followed suit on 18 December, as Romanian importers were prohibited to directly purchase goods from those countries that already invoked exchange controls [Stoenescu et al., 2007, p. 247].

The available data on the reported central bank foreign reserves shows that exchange rates of the CESEE-7 were under sizable pressure from May 1931. Currency crises troubled Hungary, Greece, Czechoslovakia, Yugoslavia and Bulgaria who (in that order) introduced exchange controls and Poland who managed to stay on the gold standard. Eventually, Romania was also unable to maintain fixed exchange rates without capital controls and in December it succumbed to the practice of exchange control thereby acknowledging a currency crisis. Thus by the end of 1931 only Poland managed not to introduce exchange controls despite

losing a considerable portions of its reserves.[48] This is in line with the country's large cover ratio (foreign reserves relative to monetary base) which exceeded that of all other CESEE countries by a large margin (own calculation based on data from *The Economist*). Simply put, Poland could afford staying on the Gold Standard during 1931 despite suffering a currency crisis. Moreover, it seems that it was prepared to do so because of political considerations i.e. its 'strategic partnership' with France [Wolf, 2007b, 2008].[49] Therefore, by the end of 1931 currency crises hit each and every country of the CESEE-7.

### 4.2.2. Banking crises

Whether a country experienced a banking crisis can be assessed both from the asset and liabilities side of the commercial bank's balance sheet. For example, the share of non-performing loans in total assets would indicate the soundness of a bank's loan portfolio. On the other hand, sharp decreases in credits or deposits would be suggestive of domestic or international bank runs. For the period under study indicators utilising the liabilities side of a commercial bank's balance sheet are more widely used than asset based measures. One explanation could be that contemporary data surveys of central banks and international institutions (e.g. League of Nations' Monthly Bulletin of Statistics) provide more readily available data on the former.

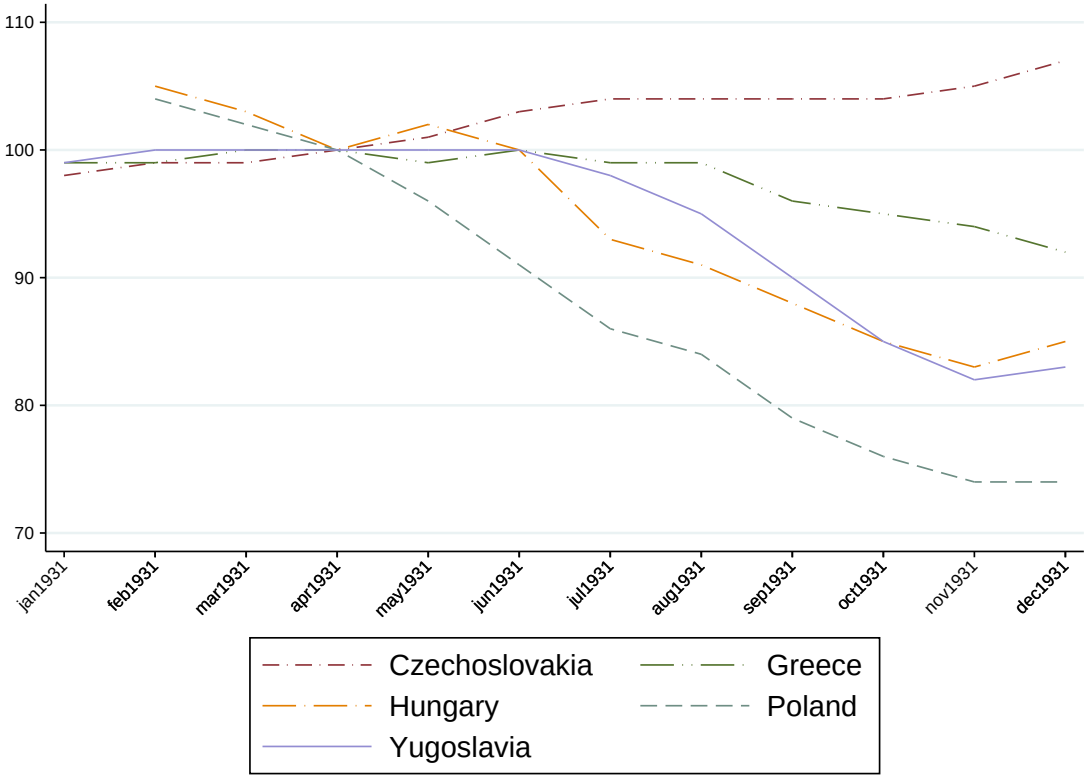
Which months can be linked with heavy commercial bank deposit withdrawals in the CESEE-7 during 1931? Figure 4.2 shows monthly values of commercial bank deposits relative to the value for April, for a period starting in January and lasting to the end of 1931, for five CESEE countries.

In Czechoslovakia commercial bank deposits were actually increasing throughout 1931. On the contrary, Greece, Hungary, Poland and Yugoslavia suffered heavy withdrawals of deposits during 1931. Nevertheless, the timing was not unanimous. In Hungary and Poland withdrawals started before April, which was not the case in other countries. However, the difference was that in Poland withdrawals continued throughout the year, while in Hungary May was actually

[48] For example, Rist and Schwob [1936, p. 238], Ellis [1941, p. 5] and Nurkse [1944, p. 81] maintain that Poland did not introduce exchange controls until April 1936.

[49] The model developed by Wolf [2007b, p. 356] predicts that if political factors were taken out of the equation Poland would have left the gold standard in 1931.

**Figure 4.2:** *Commercial bank deposits of five CESEE countries (Jan to December 1931, monthly frequency, April value = 100)*




*Notes:* Czechoslovakia - Deposits and current accounts in savings banks; Greece - current, savings and time deposits, including current accounts in all members of Central Corporation of banking companies and Postal Office Savings Bank; Hungary - current and savings accounts in twelve leading commercial banks and Postal Office Savings Bank; Poland - sight, savings and time deposits, including current accounts in all commercial banks, National Economic Bank, and State Agrarian Bank; Yugoslavia - sight, and time deposits, including current accounts in twenty leading private commercial banks.
*Sources:* [League of Nations, 1932b,c], [Statistisches Reichsamt, 1936].

a month in which commercial bank deposits grew. In Yugoslavia the heavy withdrawals started in July, while in Greece this was the case in September. Relative to April, commercial bank deposits reduced by 26, 18 and 17 per cent in Poland, Yugoslavia and Hungary, respectively. In Greece, deposits were almost equal in April and August, but then fell by almost seven per cent until the end of the year. Thus, Greece, Hungary, Poland and Yugoslavia faced heavy deposits withdrawals from commercial banks at some point during 1931 which is evidence of banking crises in these countries.

Our findings go well with contemporary writing. For example, 'commercial banks of Czechoslovakia were in a less exposed position during the international financial crisis of 1931 than those of neighbouring countries.' [League of Nations, 1935, p. 13]. Further, in Yugoslavia a banking crisis began in the form of heavy withdrawals of deposits during July and August

[League of Nations, 1934a, p. 134]. Also, the banking crisis and three day 'banking holiday' in July in Hungary are well documented [Ellis, 1939, pp. 88-89]. Moreover, recent research has identified 1931 as a year with a banking crisis in Greece [Lazaretou, 2011].

Similar evidence with a monthly frequency is unavailable for a representative sample of banking institutions in Bulgaria and Romania. Available yearly data shows that the value of deposits in private joint-stock banks operating in Bulgaria fell by 43 per cent from the end of 1929 to the end of 1932, and by 25 per cent from the end of 1930 to the end of 1931 (own calculation based on [League of Nations, 1934a, p. 71, Table 3(a)]). Total deposits of commercial banks operating in Romania reduced by 43 per cent during 1931 [League of Nations, 1934a, p. 182] – current accounts shrank by roughly a third, while other deposits reduced by a half [League of Nations, 1934a, p. 186]. Thus, a banking crisis is Bulgaria was evident as private joint-stock banks lost a quarter of their deposits during 1931. Similarly, Romania experienced a banking crisis during 1931 as commercial bank deposits fell by 43 per cent during this year.

In sum, both the quantitative and qualitative evidence shows that out of the CESEE-7 only Czechoslovakia did not record a banking crisis in 1931. On the other hand, banking sectors of Bulgaria, Greece, Hungary, Romania, Poland and Yugoslavia experienced a crisis.

### 4.2.3. Sovereign default risk crises

A well established metric of sovereign risk is the current yield on long-term sovereign bonds [Obstfeld and Taylor, 2003].[50] The high frequency data generating process of a liquid international sovereign debt market allows us to calculate the current yield on a weekly basis as the ratio of the coupon rate to the current price of the bond. The data on bond prices comes from mid-week sovereign bond price quotations from the London Stock Exchange (Bulgaria, Czechoslovakia, Greece, Hungary, Romania and Poland) and New York Stock Exchange (Yugoslavia), reported in the contemporary issues of *The Financial Times*.

Table 4.2 specifies the bonds that we have used to construct the series of bond yields. To

[50]Sometimes the current yield of a 'riskless' bond (e.g. UK consol) is deducted from the current yield of the bond of interest to arrive at a yield spread measure.

**Table 4.2:** *Overview of long-term sovereign bonds used*

| Country | (%)[1] | Year issued | Payable in | LoN[2] | Purpose |
|---|---|---|---|---|---|
| Bulgaria | 7 | 1926 | sterling, US dollar | Yes | financial stabilisation, refugee settlement |
| Czechoslovakia | 8 | 1922 | sterling, US dollar | No | financial stabilisation, reconstruction |
| Greece | 7 | 1924 | sterling, US dollar | Yes | refugee settlement |
| | 6 | 1928 | sterling, US dollar | Yes | financial stabilisation, refugee settlement |
| Hungary | 7.5 | 1924 | sterling, US dollar, other[3] | Yes | financial stabilisation |
| Poland | 7 | 1927 | sterling, US dollar | No | financial stabilisation |
| Romania | 7 | 1929 | French franc, sterling, US dollar | No | financial stabilisation |
| Yugoslavia | 7 | 1927 | US dollar | No | financial stabilisation |

*Notes:* [1]Coupon rate in per cent. [2]League of Nations mediated loan. [3]Other: lire, Swiss franc, Swedish crown, Dutch florin, Czech crown.
*Sources:* Columns 2 to 5 from [Flores and Decorzant, 2012, Flores Zendejas and Decorzant, 2015]. Column 6 from [Notel, 1986], except for Greece [The London Stock Exchange, 1929] and [Lazaretou, 2014]. Columns 2 to 6 for Yugoslavia from [Gnjatović, 1991].

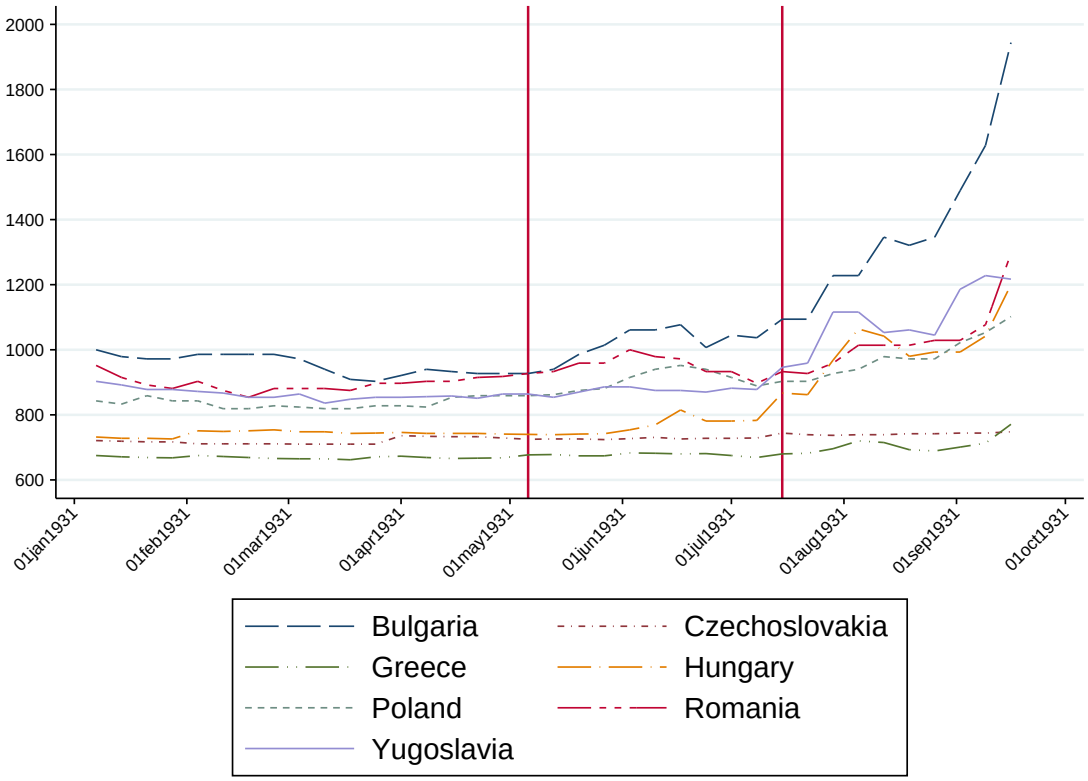
make our cross-country analysis of sovereign risk as comparable as possible we relied only on interwar issues payable in hard foreign currency, which were mainly used for financial (currency and budget) stabilisation. It should be noted that the bond issues on which we base our calculations of sovereign risk of Bulgaria, Greece and Hungary are so called 'League loans' - i.e. loans sovereigns were able to float on international markets with the help of the League of Nations. Nevertheless, this has little impact on our inference since our focus is on the movement of bond yields on the secondary market, not on primary market related issues. Indeed the League of Nations' main contribution as a mediator between international financial centers and countries in need of reconstruction was to attract capital on primary markets, rather than to supervise a sovereign until the maturity of the loan.[51]

What was the international market's view on the sovereign default risk of the CESEE-7 during 1931? Figure 4.3 presents the weekly current yield expressed in basis points for seven

[51] Accordingly, Flores Zendejas and Decorzant [2015, pp.23-24] conclude: '[...] a major strength of the League was the short-term nature of its commitment to the countries it helped. Once the objectives defined in the protocols were attained, the League's commissioner exited, allowing the borrowing country to determine its own economic policy, for which the League held no responsibility.'

CESEE countries, from the beginning of 1931 until the week preceding Britain's exit from the gold standard.[52]

**Figure 4.3:** *Long-term sovereign bond yields of seven CESEE countries (7 January to 16 September 1931, weekly frequency, basis points)*




*Notes:* The two (red) vertical lines denote the first week of May (Austrian financial crisis) and the second week of July (German financial crises), respectively.
*Sources:* Own calculations based on data from [The Financial Times, 1931].

The period until the onset of the European Financial Crisis of 1931 reveals a stable hierarchy of sovereign default risk in the CESEE-7. Namely, at the start of May international markets saw Bulgaria's sovereign bonds as the most riskiest of the group with a yield of 927 basis points. At the same time the least amount of risk was attached to Greece's sovereign bonds which recorded a yield of 668 basis points. In the period from the Austrian financial crisis (first week of May) until the week preceding the German financial crisis (first week of July) only the Bulgarian yield increased by more than 100 basis points (110 exactly). The yields of Hungary and Poland rose by 43 and 30 basis points respectively, while the Romanian yield even decreased by 30 basis points. However, following the German financial crisis yields

[52] After 21 September 1931 it is hard to separate the effects of Britain's devaluation and the subsequent introduction of exchange controls in most CESEE countries on sovereign bond price quotations at the London Stock Exchange.

spiked in Bulgaria, Hungary, Poland, Romania and Yugoslavia. In the period from the German financial crisis (second week of May) until the week preceding Britain's exit from gold (second week of September) bond yields increased by 851, 363, 333, 271, 199, 91 and 3 basis points in Bulgaria, Romania, Hungary, Yugoslavia, Poland, Greece and Czechoslovakia, respectively.

Thus only Czechoslovakia managed to keep stable sovereign bond yields throughout the sample period. In the case of Greece, most of the increase in sovereign yields came only in September. In the first three weeks of September (thus including the week in which Britain left the gold standard) Greece's sovereign yields increased by 176 basis points which was a strong signal of a sovereign risk crisis. Moreover, the fact that the Athens Stock Exchange remained closed from mid-September 1931 to mid-December 1932 [Lazaretou, 2014, p. 122] is indicative of a sovereign risk crisis. In other CESEE-7 countries a sovereign risk crisis was evident from mid-July, while bond yields of Bulgaria, Hungary and Poland started to increase somewhat already from the beginning of May.

In sum, the evidence from international secondary markets for long term sovereign bonds shows that sovereign default risk of Czechoslovakia remained stable during 1931. On the contrary, sovereign risk of Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia increased markedly, although with different pace and timing.

### 4.2.4. Summary of financial crises in CESEE during 1931

The main findings so far, on financial crises in the CESEE-7 during 1931, can be summarised as follows. Currency crises, as evidenced by a marked loss of foreign reserves or the introduction of exchange controls, troubled the CESEE-7. Banking crises as measured by commercial bank deposit withdrawals, and sovereign default risk crises as captured by the current yield on long-term sovereign bonds were present in all of the CESEE-7 except in Czechoslovakia. Hence, 1931 was synonymous with financial crises in Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia. On the other hand, in Czechoslovakia, 1931 was only analogous to financial crises.

Table 4.3 presents a summary of financial crises in CESEE-7 during 1931, as well as the dates of the introduction of exchange controls, official devaluation of currency, and default

**Table 4.3:** *Summary of Financial Crises in CESEE-7 during 1931, as well as the dates of the introduction of exchange controls, official devaluation of currency, and default on foreign sovereign debt*

| Country | Financial Crisis in 1931[1] | Introduction of exchange controls[2] | Official devaluation of currency[3] | Default on foreign sovereign debt[4] |
|---|---|---|---|---|
| Bulgaria | C, B, D | 15 Oct 1931 | n.a. | 1 Apr 1932 |
| Czechoslovakia | C | 2 Oct 1931 | Feb 1934; Oct 1936 | n.a. |
| Greece | C, B, D | 28 Sep 1931 | Apr 1932 | 1 May 1932 |
| Hungary | C, B, D | 17 Jul 1931 | n.a. | Dec 1931 |
| Poland | C, B, D | 26 Apr 1936 | n.a. | n.a. |
| Romania | C, B, D | 18 Dec 1931 | Nov 1936 | 15 Aug 1933 |
| Yugoslavia | C, B, D | 7 Oct 1931 | Jul 1932 | Oct 1932 |

*Notes:* [1]C, B and D stand for currency, banking and sovereign default risk crises, respectively.
*Sources:* [2]Bulgaria: [Dimitrova and Ivanov, 2014, pp. 202-203]; Greece: [Lazaretou, 2014, p. 127]; Romania: [Stoenescu et al., 2007, p. 247]; Yugoslavia: [Hinić et al., 2014, pp. 277, 299]; other countries: [League of Nations, 1940, pp. 194-195, Table 101]
[3]Greece: [Lazaretou, 2014, p. 127]; Romania: [Stoenescu et al., 2014, p. 247]; Yugoslavia: [League of Nations, 1940, pp. 194-195, Table 101], [Hinić et al., 2014, p. 298]; other countries: [League of Nations, 1940, pp. 194-195, Table 101]
[4]Bulgaria: [League of Nations, 1936, p. 288], [Dimitrova and Ivanov, 2014, p. 221]; Greece: LoN [League of Nations, 1936, p. 300], [Lazaretou, 2014, p.102, 123, 131]; Hungary: [League of Nations, 1936, p. 300]; Romania: [League of Nations, 1936, p. 301], [Stoenescu et al., 2014, pp. 247, 273]; Yugoslavia: [League of Nations, 1936, p. 303], [Gnjatović, 1991, p. 172], [Hinić et al., 2014, p. 298].

on foreign sovereign debt for the same sample of countries. Putting the financial crises in the CESEE-7 in the perspective of the 1930s, it is evident that exchange controls, where introduced, were used to put capital flight under control and defend a fixed exchange rate [Ellis, 1941, pp. 878–879]. In turn, fixed exchange rates were preferred by these countries as 'original sin' [Eichengreen et al., 2007] led them to have foreign public debts denominated in foreign currency. Accordingly, the CESEE-7 resisted currency devaluations as long as they could. As table 4.3 shows, none of the CESEE-7 devalued during 1931.[53] Moreover, as can be seen from table 4.3, sovereign risk crises of 1931 in Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia - possibly in large part driven by currency and banking crises in the same countries - precipitated the ensuing defaults on foreign sovereign debt in five out of the six cases (Poland did not default).

In this section we argued that all CESEE countries experienced at least one type of financial crisis during 1931. In the next section we discuss how global shocks and macroeconomic fundamentals may have contributed to these financial crises.

## 4.3 Explaining financial crises in CESEE during 1931

### 4.3.1. Global shocks and macroeconomic fundamentals

The years preceding the European Financial Crisis of 1931 saw considerable changes in the global economy. The onset of the Great Depression brought a fall in the global demand for commodities and a reduction in the availability of international long-term credit both of which lasted throughout 1931. 'The most severe contraction of demand' the international economy had ever known is documented by Feinstein et al. [2008, pp. 93-97] - falling volumes of world trade interacted with falling prices which resulted in the value of world trade falling by 20 per cent in 1930, 29 per cent in 1931, and by 32 per cent in 1932. Contraction of international long-term credit started in 1929 as European borrowers experienced a sudden stop and capital flow reversal from major international financial centers i.e. New York, London,

[53] However, it should be noted that in countries that introduced exchange controls implicit devaluation was common. Namely, foreign convertible currency was traded with a premium which was paid above the official foreign exchange rate (See for example [Dimitrova and Ivanov, 2014, p. 203] and [Hinić et al., 2014, p. 298]).

Paris, Amsterdam, Stockholm and Zurich [Accominotti and Eichengreen, 2016]. Lending to Germany brought an incomplete recovery in 1930, only to completely collapse again in 1931. Lending from New York and London - the two largest creditors of European countries during the period from 1919 to 1932 - followed the same overall pattern [Accominotti and Eichengreen, 2016, p. 8, Figure 1].

The economies of the CESEE-7 would not have been equally affected by these developments in the global economy. First, the global demand shock would have hit primary good exporting countries more strongly than industrialised countries as prices of primary products dropped more steeply than those of manufactures [Feinstein et al., 2008, p. 94, Table 6.2]. Table 4.4 shows the composition of exports for nine CESEE countries at the onset of the Great Depression.

**Table 4.4:** *Composition of exports (percentage of primary and manufactured products in total exports) for nine CESEE countries, 1928-1929 average*

| Source | [Drabek, 1986][1] | | [League of Nations, 1931a][2] |
|---|---|---|---|
| Products | Primary | Manufactures | Manufactures |
| Bulgaria | 93.1 | 6.9 | 7.2 |
| Czechoslovakia | 26.3 | 73.7 | 70.05 |
| Greece | n.a.[3] | n.a. | 2.05 |
| Hungary | 77.9 | 22.1 | 21.45 |
| Poland | 76.2 | 23.8 | 17.05 |
| Romania | 96.2 | 3.8 | n.a. |
| Yugoslavia | 83.4 | 16.6 | 9.35 |
| Austria | n.a. | n.a. | 73 |
| Germany | n.a. | n.a. | 71.85 |

*Notes:* [1]Drabek [1986] uses the Standard International Trade Classification developed by the United Nations after the Second World War. [2]League of Nations [1931a] use The International Classification of the Brussels Convention of 1913. [3]n.a. denotes that such data is not available in the given data source.
*Sources:* [Drabek, 1986, pp. 470-479], [League of Nations, 1931a, pp. 169-170]

It is evident that most of CESEE mainly exported primary goods - the percentage of primary products in total exports was 76.2 per cent or above in Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia. However, in Czechoslovakia, Austria and Germany the situation was different. It was the percentage of manufactures in total exports that was above 70 per cent in all three countries. Thus, Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia were affected more adversely by the global demand shock than relatively more

industrialised Czechoslovakia. Second, the curtailment in the availability of international credit would have affected net capital importers more than net capital exporters. The available data for the second half of the 1920s shows that Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia were net capital importers [United Nations, 1949, p. 12].[54] On the other hand, Czechoslovakia managed to consistently record positive net capital movements [United Nations, 1949, p. 11]. Hence, contrary to capital exporting Czechoslovakia, other CESEE countries heavily reliant on foreign capital imports were negatively affected by the drying up of international credit. Therefore, Czechoslovakia was less affected by the changes in the global economy brought by the Great Depression. This partly explains why Czechoslovakia was less susceptible to financial crises than the rest of the CESEE-7 during 1931.

Another part of the explanation lies is the fact that Czechoslovakia had an economy which was fundamentally different from those in Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia. Table 4.5 reports several macroeconomic indicators for the CESEE-7 a year before the financial crisis of 1931.

**Table 4.5:** *GDP per capita (1990 GK USD), value of exports (in current USD) per capita, occupational shares in agriculture (percentage of working population in agriculture in total working population) and openness ratio (exports plus imports as share of GDP) of seven CESEE countries in 1930*

| Country | GDP per capita[1] | exports per capita[2] | % working in agriculture[3] | openness ratio[4] |
|---|---|---|---|---|
| Bulgaria | 1228 | 7.40 | 81.9 | 26.2 |
| Czechoslovakia | 2804 | 37.04 | 37.5 | 43.3 |
| Greece | 2057 | 11.87 | 61.1 | 62.5 |
| Hungary | 2462 | 18.45 | 54.8 | 32.7 |
| Poland | 1996 | 9.66 | 67.3 | 22.8 |
| Romania | 1097 | 12.10 | 80.7 | 21.8 |
| Yugoslavia | 1316 | 8.33 | 79.7 | 25.9 |

*Notes and Sources:* [1][Broadberry and Klein, 2012]. [2]Own calculations based on [League of Nations, 1932a, 1933], [SEEMHN, 2014], [League of Nations, 1932e] and [Maddison, 2010]. [3][Buyst and Franaszek, 2010, p. 210 Table 9.1]. [4]Data refer to 1929. Bulgaria, Greece, Romania and Yugoslavia from [Morys and Ivanov, 2015, p. 397, Table 6]. Own calculations for Czechoslovakia, Hungary and Poland based on GDP data from [Lethbridge, 1985, pp. 550, 571] and [Eckstein, 1955, p. 165], and trade data from [Mitchell, 2013].

As table 4.5 shows, Czechoslovakia had the highest GDP per capita and exports per capita,

[54]Poland in 1926 and Yugoslavia in 1929 were the only exceptions.

as well as the smallest share of active population working in agriculture out of the CESEE-7. Moreover, Czechoslovakia was only surpassed by Greece in terms of the openness of its economy to foreign trade. While having the highest income and exports per capita as well as being the most industrialised economy in the group worked to Czechoslovakia's advantage, perhaps being one of the most open CESEE economies to foreign trade contributed to a loss of central bank reserves during 1931. This is further supported by the fact that Greece, Czechoslovakia and Hungary - the three most open economies from the CESEE-7 - lost the most central bank reserves, while Romania who was the least open economy lost the least during 1931. Thus it was not only the composition of exports and net creditor status that made Czechoslovakia stand out from the rest of the CESEE-7, in general its macroeconomic indicators were more favourable.

However, how did macroeconomic fundamentals of the CESEE-7 countries fare during the run up to the European Financial Crisis of 1931? Table 4.6 reports the dates of the pre-crisis peaks as well as changes in the Albers and Uebele [2015] monthly economic activity index from the month of the pre-crisis peak to April 1931 i.e. the eve of the European Financial Crisis, for eight CESEE countries.[55] As can be seen from table 4.6 CESEE economies peaked either during 1929 or 1930. Thus, macroeconomic fundamentals were weakened in all CESEE economies before 1931. Apart from Austria and Germany economic activity declined the most in Bulgaria, Hungary and Poland. Romania and Yugoslavia were on the other extreme, while Czechoslovakia saw a decline of economic activity which was below the sample average. Hence, the economies of Bulgaria, Hungary and Poland were more weakened than those of Czechoslovakia, Romania and Yugoslavia by April 1931. Therefore, worsened macroeconomic fundamentals help explain why currency, banking and sovereign risk crises started earlier in Bulgaria, Hungary and Poland, than in Romania and Yugoslavia, and for the most part bypassed Czechoslovakia (cf. section 4.2).

Two main points arise from the above discussion of global shocks and macroeconomic

[55]The Albers and Uebele [2015] monthly economic activity index synthesizes information from a comprehensive number of country specific time-series data on production, transport, employment, trade, prices, money and banking into a single indicator.

**Table 4.6:** *Dates of pre-crisis peaks and changes in economic activity (in per cent) of eight CESEE countries*

| Country | Date of pre-crisis peak | Change from pre-crisis peak to April 1931 |
|---|---|---|
| Bulgaria | May 1930 | −11.28 |
| Czechoslovakia | July 1929 | −6.49 |
| Hungary | Aug. 1929 | −10.45 |
| Poland | May 1929 | −10.80 |
| Romania | Dec. 1929 | −1.96 |
| Yugoslavia | Dec. 1929 | −2.00 |
| Austria | Jun 1929 | −11.86 |
| Germany | April 1929 | −16.41 |

*Notes and Sources:* Dating of pre-crisis peaks was done according to the Bry et al. [1971] procedure, using the code written by James Engels (available at http://www.ncer.edu.au/resources/data-and-code.php). Dates of pre-crisis peaks and underlying data kindly communicated by Thilo Albers. Changes in economic activity are own calculations based on economic activity series (all indicators) shown in Albers and Uebele [2015].

fundamentals. First, changes in the global economy such as the drying up of international credit and falling global demand were important factors driving financial crises in the CESEE-7 during 1931. However, they affected Czechoslovakia less than other CESEE-7 economies because of its composition of exports and net creditor status. Second, all CESEE economies had weakened fundamentals on the eve of the European Financial Crisis of 1931. However, the pre-crisis slowdown of economic activity was much more pronounced in Bulgaria, Hungary and Poland than in Czechoslovakia, Romania and Yugoslavia, which accounts for the earlier occurrence of financial crises in the former group of countries.

In sum we argued that global shocks and macroeconomic fundamentals were contributing factors to financial crises in CESEE in 1931. Next we explore how international financial crisis transmission may have contributed to these financial crises.

### 4.3.2. International transmission of financial crises - terminology and definitions

There is a long tradition in economic history in using the term 'transmission' (alternatively, 'spread' or 'propagation' – all of which are used as synonyms in the present chapter) to help

describe a phenomenon where a shock in one country (usually a financial crisis) is transmitted internationally to one or more countries [Kindleberger, 1978]. The use of the term 'contagion' in relation to the international spread of financial crises is of more recent nature.[56] It has been stressed multiple times that there is no consensus on exactly how contagion should be defined (e.g. Claessens et al. [2001, p. 12], Pericoli and Sbracia [2003, p. 573], Dungey and Tambakis [2005, p. 3]).

In early empirical applications [Eichengreen and Rose, 1999, Eichengreen et al., 1996] contagion referred to any channel that would transmit a crisis internationally. However, as economies are linked internationally through various economic fundamentals such as finance or trade, the term 'spillovers' [Masson, 1999b] was proposed to signify the spread of financial crises through these linkages.[57]

In the present chapter we subscribe to the strand of literature which differentiates between spillovers and contagion [Masson, 1999b]. Spillovers arise from international linkages of economic fundamentals, while contagion is by definition unrelated to economic fundamentals.[58] Intuitively, this notion of contagion is perhaps most easily understood as a residual – i.e. the part of international crisis transmission left unexplained after other effects (e.g. global shocks, macroeconomic fundamentals, spillovers) have been accounted for [Masson, 1999a, p. 588]. In the rest of section 4, we consider spillovers and contagion as contributing factors to financial crises in the CESEE-7 during 1931.

### 4.3.3. Finance channel spillovers

Financial linkages can be a channel for spillover effects. A financial crisis may spillover directly from one country to another due to the inter-connected financial institutions (henceforth IFI) effect. This mechanism requires financial institutions (e.g. banks) to be linked to each other

[56] For example, newer editions of Kindleberger's classic [Kindleberger and Aliber, 2011] renamed the chapter originally titled 'International Propagation' [Kindleberger, 1978] to 'International Contagion'. The post 1990s literature on international financial contagion is extensive - for a review see for example Claessens et al. [2001] or Pericoli and Sbracia [2003].

[57] Alternatively the term 'fundamentals-based contagion' [Claessens et al., 2001, Kaminsky and Reinhart, 2000] has been used.

[58] Masson [1999b, p. 267] defines contagion as 'changes in expectations that are not related to changes in a country's macroeconomic fundamentals.' Similarly Moser [2003, p. 162] defines contagion as 'cross-country propagation of shocks not related to or explained by economic fundamentals'.

through lending [Allen and Gale, 2000]. For example, a crisis may spillover from country i to country j, if banks from country i, faced by a liquidity shock, withdraw their funds from banks in country j.[59]

A financial crisis may also spillover indirectly through a common lender effect [Caramazza et al., 2004, Kaminsky and Reinhart, 2000, Van Rijckeghem and Weder, 2001]. In empirical work the banking sector of a particular country is identified as a common lender, though in principle the role of the common lender may be played by any creditor (e.g. a sovereign or any financial institution) that lends to both the crisis country and the country to which the crisis potentially spills over. The existence of a common bank lender effect presumes that bank exposures to a crisis country were large implying substantial potential losses [Van Rijckeghem and Weder, 2001, p. 295]. If a common lender experiences an unexpected loss due to a financial crisis in country i, the common lender may stop lending to country j or even withdraw capital from country j for example in order to rebalance its portfolio.

Is there evidence of finance channel spillovers contributing to financial crises in the CESEE-7 during 1931 either due to the IFI or common lender effect? For more recent periods these effects are commonly identified through international banking linkages [Caramazza et al., 2004, Kaminsky and Reinhart, 2000, Van Rijckeghem and Weder, 2001]. Unfortunately, these linkages are not easy to establish for CESEE in 1931, since in general there is limited direct evidence on the magnitude and direction of short-term capital flows during the interwar period [Accominotti and Eichengreen, 2016, p. 8]. Nevertheless, qualitative sources document that it was common for CESEE countries to rely on private foreign short-term capital [League of Nations, 1932d, p. 10]. Foreign banks could have supplied much of these short-term funds through their subsidiaries located in CESEE, banks operating in CESEE but whose share capital was dominantly foreign owned, or banks whose share capital was for the most part domestically owned. For example, short-term capital 'was invested in Poland largely through the intermediary of the Polish branches or affiliates of foreign banks.' [League of Nations, 1934a,

[59]We refer to the country in which the crisis originates as country i (sometimes in the literature called the ground zero country) and the country to which the crisis spills over as country j.

p. 172] A similar situation prevailed in Romania as 'larger domestic banks, like the relatively important branches or subsidiaries of foreign banking institutions operating in Roumania [...] operated largely with foreign short-term credits and received deposits almost exclusively on short term.' [League of Nations, 1934a, p. 182]

Accordingly, contemporaries attached a prominent role to short-term capital in bringing about the financial crisis of 1931.[60] Moreover, contemporary writing is inexorable in claiming that banking sectors of Bulgaria, Poland, Romania and Yugoslavia faced withdrawals of funds from abroad during 1931. We start with the Polish case. The Economic Intelligence Service of the League of Nations points to voluminous withdrawals of credits by international bank lenders from the Polish banking sector:

> During the general liquidity crisis which followed the collapse of the Creditanstalt in Austria and the German banking holidays in the summer of 1931, British, French and American banks as well as those of the Netherlands, Belgium and Switzerland withdrew large portions of their credits to Polish banking institutions. In the second half of 1931, the Polish banks lost 258 million zloty in foreign credits. [League of Nations, 1934a, p. 173]

In particular, short-term foreign borrowing of Polish banks from England, France, the United States and others[61] dropped by 228 million zloty during 1931 [League of Nations, 1934a, p. 172]. If these international bank lenders withdrew credits to Poland after suffering losses in Austria, Germany or Hungary, this would strongly suggest that the common lender effect was at work in Poland. On the other hand, Austrian short-term credits to Poland decreased by 21 million zloty while German short-term lending increased by 11 million zloty during 1931 [League of Nations, 1934a, p. 172]. Thus, the direct effects on Polish banking through

[60] For example in a memorandum on the international short-term indebtedness, commissioned by the Carnegie Endowment for International Peace and the International Chamber of Commerce, Conolly [1936, p. 338] wrote: 'Whatever may have been the deeper forces underlying the situation in 1931, the proximate cause of the calamitous international liquidity crisis of that year [...] was the pyramiding of foreign short-term liabilities. See also the writing of Bertil Ohlin [League of Nations, 1931b, p. 313]: 'To the enormous amount of outstanding short-term obligations in 1931 must largely be attributed the severity of the crisis.'

[61] The 'others' category probably represents banks from other creditor countries such as Netherlands, Belgium and Switzerland. Austria and Germany were recorded separately, see below.

interconnected financial institutions with Austria were comparably smaller than withdrawals from England, France and the US. Moreover, the banking linkages with Germany seem to have even had a positive effect as German credits to Poland increased during 1931. Hence the available evidence for Poland suggests that spillovers through the finance channel could have been both due to the common lender and interconnected financial institutions effect.

The League of Nations ascribes the deterioration of bank balance sheets in Bulgaria to the calling in of foreign credits:

> Despite a reduction during the crisis of 54 per cent in their deposits and of 40 per cent in their aggregate accounts due principally to the calling in of credits by their head offices during the European banking crisis of 1931 the foreign banks remain the most important commercial credit institutions in Bulgaria. [League of Nations, 1935, p. 10]

Similarly, in the case of Romania the calling in of foreign short-term credits is highlighted:

> The international financial crisis which began in Central Europe in the summer of 1931 [...] had serious repercussions on the larger Roumanian banks, on account of their dependence upon foreign short-term credits and their close relations with Central European banking institutions. In the course of the autumn of 1931, a large part of the foreign credits enjoyed by Roumanian banks was called in. [League of Nations, 1934a, p. 182]

Evidence allowing us to discern short-term capital flows among international bank lenders and the Bulgarian and Romanian banking sector, as we did in the Polish case, is to the best of our knowledge unavailable. Nevertheless, both in Bulgaria and Romania a small number of 'Big banks' held a large share of total commercial bank deposits. In Bulgaria six foreign 'Big banks' accounted for 38 per cent of total deposits in Bulgarian commercial banking in 1929 [League of Nations, 1934a, p. 70]. In 1930, after certain mergers,[62] there were four large

[62] This includes Deutsche Bank that merged with Credit Bank, and Balkan Bank that merged with Franco Belgian Bank Bulgaria [League of Nations, 1934a, pp. 69-70].

foreign banks in Bulgaria that relied on French, Belgian, German and Italian capital. Listed in ascending order of the value of deposits and current accounts in 1930 these were: Българска Генерална банка (Bulgarian General Bank), Франко Белгийска и Балканска банка (Franco Belgian and Balkan Bank), Кредитна банка (Credit Bank) and Италиянска и Българска търговска банка (Italian and Bulgarian Commercial Bank) [Banque Nationale de Bulgarie, 1931, p. 28].[63]

In Romania eleven banks held 29 per cent of deposits of all Romanian banks at the end of 1931 [League of Nations, 1934a, p. 182]. Several of these were either foreign banks or heavily relied on foreign short-term funds. For example, the Jewish Banca Marmerosch, Blank & Co, was 'one of the two most prominent private institutions in the country' whose principal foreign creditor was the Creditanstalt [Lampe and Jackson, 1982, p. 481]. This bank eventually failed in October of 1931, while the German controlled Banca Generală a Ţării Româneşti (General Bank of Romanian Lands) collapsed in July of 1931 [Bernanke and James, 1991, pp. 52-53]. Moreover, a set of French controlled banks - Banca de Credit Roman (Roman Credit Bank), Banca Comercială Română (Romanian Commercial Bank) and Banca Franco-Română (Franco-Romanian Bank) - were in a 'critical situation' in 1931 [Baicu and Mauri, 2010, pp. 24-25].

The presence of a number of European banks in Bulgaria and Romania suggests that the calling in of foreign credits that the League of Nations records did not exclusively come from Central European countries. Thus if the case of Poland is of any guidance for Bulgaria and Romania, finance channel spillovers could have been due to both a common bank lender and interconnected financial institutions effects.

The case of Yugoslavia seems somewhat different to the ones considered above. Rather than pointing out foreign withdrawals as in the case of Poland, Bulgaria and Romania, the League of Nations notes that the events in Central Europe affected Yugoslav banks through the fall in confidence of domestic depositors:

[63]The first two were comprised of French and Belgian capital, which explains their eventual merger in 1938 [Lampe and Jackson, 1982, p. 477]. The Credit Bank was German, and the only bank among the four that pre-dated the interwar period [Lampe and Jackson, 1982, p. 395].

> The Austrian Credit-Anstalt crisis of May 1931, the temporary closing of the German banks in July of the same year, and the three-day bank holiday in Hungary which followed the German moratorium affected the confidence of the Yugoslav depositor [...] [League of Nations, 1935, p. 134]

Given that share capital of many of twenty largest banks in Yugoslavia – accounting for more than a half of total deposits as well as credits in the banking sector in 1929 – was in fact predominantly foreign owned (see [League of Nations, 1934a, p. 224] and [Rozenberg, 1937, p.12]) it would be most surprising if foreign banks withdrew funds from neighboring Bulgaria and Romania but would completely spare Yugoslavia. However, one could argue that while international spillovers were present in Yugoslavia they were of a smaller magnitude than in Bulgaria or Romania. The fact that by the end of the 1920s foreign share of bank capital in Yugoslavia was only half of its share in Bulgaria is supportive of this view [Lampe and Jackson, 1982, p. 395]. Moreover, the specific dual structure of Yugoslav banking explains why the reliance on foreign short-term capital was not universal throughout Yugoslav banking. The main source of financing in the two dominant financial centers in Yugoslavia - Belgrade and Zagreb - was very different. While European funds were concentrated in large Zagreb banks [Lampe and Jackson, 1982, pp. 395, 477-478] big Belgrade banks had little need for foreign capital as they were amply supplied with credits by the National Bank of Yugoslavia (also situated in Belgrade).[64] The bulk of the foreign banking presence was thus concentrated in former Austro-Hungarian parts of the country. Hence we could expect that banks from these regions lost a lion's share of the 300 million dinar outflow mentioned by the National Bank of Yugoslavia in relation to the collapse of the Creditanstalt.[65] However, put in relative perspective, this amounted to only around two per cent of total commercial bank deposits as they stood on 1 June 1931 (own calculation based on [National Bank of the Kingdom of Yugoslavia, 1929-1938]). This is another piece of evidence suggesting that potential spillover

[64] Namely, while being only one of twenty regional branches of the National Bank of Yugoslavia during the 1920s, the Belgrade branch accounted on average for circa 43 per cent of credits disbursed by the Yugoslav central bank during the mentioned period (own calculation based on [Narodna Banka Kraljevine Jugoslavije, 1935, p. 313]).

[65] See the Annual Report of the National Bank of Yugoslavia for 1931, pages XVI and XVII.

effects were relatively small in Yugoslavia.

Finally, banking crises in Greece and Hungary are hard to connect with finance channel spillovers. In the case of Greece, the majority of deposit withdrawals ensued after the introduction of exchange controls on 28 September 1931. This leads to a conclusion that withdrawals must have been from the domestic public, as international capital movements would have been much more difficult under exchange controls. As for Hungary, the same reasoning applies after it introduced exchange controls on 17 July 1931. However, foreign withdrawals may have occurred in the period from the Austrian financial crisis in May until the introduction of exchange controls. Nevertheless, this is not borne out by empirical evidence. As our data shows, if anything, commercial bank deposits increased in May 1931 (cf. section 4.2).

In sum, finance channel spillovers contributed to banking crisis in several but not all of the CESEE-7. The available evidence suggests that the withdrawal of foreign short-term credits from the banking sectors of Poland, Bulgaria, Romania and Yugoslavia seems to have, to varying extent, contributed to banking crises in these countries. The presence of a wide array of international bank lenders (e.g. banks from Austria, Germany, England, France, Belgium, Italy and US) suggest that both the interconnected financial institutions effect and the common lender effect were possible. The Polish case is most indicative that both effects may have been at work.

#### 4.3.4. Trade channel spillovers

Trade is another channel for spillovers. Bilateral trade may be a source of direct spillovers [Gerlach and Smets, 1995] and lead to the income effect [Forbes, 2002]. A crisis may spillover from country i to country j via international trade if a crisis in country i reduces its economic activity which in turn leads to a reduction of imports from country j. The condition for this income effect to be of noticeable consequence for the exports of country j, is that country i is a relatively large export market for country j.

International trade may also lead to spillovers due to the competitiveness effect. However,

unlike the income effect the competitiveness effect is conditional on a change in the exchange rate in country i. For example, if countries i and j have a homogeneous trade structure and country i devalues its currency, the relative improvement in country i international trade competitiveness, may lead to spillovers in country j in two different ways. First, country j domestic sales may fall as imports from country i increase. Second, country j foreign sales (i.e. exports) to third markets (i.e. markets other than country i) may decline as country i exports to these markets increase (for effects related to third markets see Corsetti et al. [2000]).

Is there evidence of trade channel spillovers contributing to financial crises in the CESEE-7 during 1931 either due to the income or competitiveness effect? The contribution of the competitiveness effect must have been limited as financial crises in the CESEE-7 started before Britain and Austria devalued their currencies on the 21 and 31 of September 1931, respectively [League of Nations, 1940, pp. 194-195, Table 101]. On the contrary, the income effect may have been of consequence as Austria and Germany - two countries severely hit by financial crisis in May and July of 1931, respectively - were in fact large export markets for the CESEE-7. The income effect would manifest itself as a drop of exports from the CESEE-7 to Austria or Germany. An income effect could have contributed to currency crises as well as increased sovereign risk in the CESEE-7. Reduced exports would mean less foreign exchange earnings, which would put pressure on exchange rates and lead central banks to sell foreign exchange in order to defend fixed exchange rates. Moreover, a reduction of export earnings would increase sovereign risk as foreign exchange is crucial for the servicing of foreign denominated sovereign debt.

Table 4.7 shows export shares of the CESEE-7 captured by Austria and Germany during 1929-1931. It is evident that Austria and Germany were large export markets for CESEE countries. Germany accounted for around nineteen and Austria for approximately fifteen per cent of the total value of exports in the CESEE-7 on average during 1929-1931.

Table 4.8 shows the current export value to Austria and Germany, expressed in the national currency of the exporter, for seven CESEE countries during 1929-1931. We concentrate on comparing the export values recorded in 1931 with the ones from the preceding year. While

**Table 4.7:** *Export shares (percentage of total value of exports) of seven CESEE countries captured by Austria and Germany, for 1929, 1930 and 1931.*

| | Austria | | | Germany | | |
|---|---|---|---|---|---|---|
| exports from | 1929 | 1930 | 1931 | 1929 | 1930 | 1931 |
| Bulgaria | 12.5 | 7.7 | 16.7 | 29.9 | 26.2 | 29.5 |
| Czechoslovakia | 15 | 14 | 13.7 | 22.9 | 20.4 | 19 |
| Greece | 2.5 | 2.8 | 5.6 | 23.2 | 23.3 | 14 |
| Hungary | 30.4 | 28.1 | 29.8 | 11.6 | 10.3 | 12.8 |
| Poland | 10.5 | 9.3 | 9.3 | 31.2 | 25.7 | 16.8 |
| Romania | 9.4 | 9.1 | 10.7 | 27.6 | 18.8 | 11.4 |
| Yugoslavia | 15.6 | 17.7 | 15.2 | 8.5 | 11.7 | 11.3 |
| CESEE-7 avg | 15.6 | 14.3 | 15.9 | 22 | 18.9 | 16.8 |

*Sources:* [League of Nations, 1932a, 1933]

**Table 4.8:** *Current export values (million of national currency of the exporter) of seven CESEE countries to Austria, Germany and Hungary for 1929, 1930 and 1931.*

| | Austria | | | Germany | | |
|---|---|---|---|---|---|---|
| exports from | 1929 | 1930 | 1931 | 1929 | 1930 | 1931 |
| Bulgaria | 803 | 478 | 993 | 1912 | 1621 | 1748 |
| Czechoslovakia | 3074 | 2439 | 1796 | 4691 | 3572 | 2493 |
| Greece | 177 | 166 | 234 | 1613 | 1392 | 588 |
| Hungary | 316 | 256 | 170 | 121 | 94 | 73 |
| Poland | 294.6 | 227 | 175 | 877.1 | 627 | 315 |
| Romania | 2733 | 2589 | 2368 | 8005 | 5364 | 2543 |
| Yugoslavia | 1237.8 | 1199 | 727 | 675.1 | 791 | 543 |

*Sources:* [League of Nations, 1932a, 1933]

the value of exports to Austria and Germany from Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia decreased (except for Greek exports to Austria), Bulgarian exports to Austria and Germany actually increased. Exports from Czechoslovakia and Yugoslavia to both Austria and Germany decreased considerably. For Greece, Poland and Romania the drop in exports to Germany was much more pronounced than the decline in exports to Austria, while the opposite was true for Hungary.

In sum, exports from the CESEE-7 (except Bulgaria) to Austria and Germany declined during 1931. Financial crises in Austria and Germany may have reduced economic activity in these countries which could have led to a curtailment of imports from Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia. Austria and Germany suggest themselves as sources of an income effect for Czechoslovakia and Yugoslavia, while only Germany seem to

have mattered for Greece, Poland and Romania, and only Austria for Hungary. Reduced foreign exchange earnings could have contributed to both currency crises and increased sovereign default risk in the mentioned CESEE countries. Several caveats are in order here. First, it should be noted that exports of the CESEE-7 to Austria and Germany were already falling during 1930 when compared to 1929 (save for Yugoslav exports to Germany). Thus the reduction in exports in 1931 may to an extent be driven by a global demand shock. Second, we report nominal values of exports in table 4.8. Hence some part of the reduction of export values can undoubtedly be accounted for by deflation.

### 4.3.5. International financial contagion

In the preceding discussion we were able to use macroeconomic data to explore the relation of changes in the global economy, macroeconomic fundamentals and spillovers with financial crises in the CESEE-7 in 1931. However, macroeconomic evidence is of limited help in identifying financial contagion, as the two are by definition unrelated.[66] It is not surprising that theories of pure contagion tend to be very microeconomic in their focus, and as such difficult to incorporate into macroeconomic models that are rich enough to include the effects of spillovers and global shocks [Masson, 1999a, p. 588]. Nevertheless, we can still ask through which mechanisms financial contagion *could have* spread internationally during 1931?

To explain financial contagion (henceforth contagion) theoretical frameworks model the behaviour of financial agents by allowing for information asymmetries. Depending whether one defines financial agents as sovereign lenders, banks or bondholders (or other individual or institutional investors), contagion may arise if a crisis in country i - and not observed changes in macroeconomic fundamentals of country j - leads financial agents to, for example, stop lending, withdraw funds or sell assets in country j. We concentrate on describing how three theoretical mechanisms of contagion - herd behavior, signal extraction failure and wake-up calls - may have operated during 1931.

[66] Financial contagion arises when the international transmission of a financial crisis cannot be linked to observed changes in macroeconomic fundamentals and results solely from the behaviour of financial agents [Claessens et al., 2001, p. 22].

First, herd behaviour may contribute to contagion spreading from country i to country j, if some financial agents follow the actions of others based on an incomplete picture of macroeconomic conditions in a given country.[67] This mechanism could have been at work if following a financial crisis in Austria, Germany or even Britain a group of informed investors withdrew funds, or sold off assets in one or more countries from the CESEE-7, while a group of uninformed investors facing incomplete information on the potential repercussions of these financial crises for the CESEE-7 followed the actions of informed investors.

Second, signal extraction failure may occur when financial agents face incomplete information [Moser, 2003, p.163]. Financial agents may have took financial crisis in Austria, Germany or Britain as a signal that one or more countries from the CESEE-7 may be facing similar issues - either because of some similarity or interdependence between one or more pairs from the two groups of countries - and withdrew funds from the latter. However, financial agents may have failed to extract the 'right' signal if information asymmetries led them to base their actions on incomplete information rather than true fundamentals.

Third, a financial crisis in country i may give financial agents a wake-up call [Goldstein, 1998, pp. 18-19] which leads them to reassess macroeconomic fundamentals of country j. Contagion may occur if financial agents interpret objectively unchanged fundamentals of country j in a way that leads them to see problems they have previously overlooked.[68] Thus financial crises in Austria, Germany or Britain, may have 'nudged' financial agents to interpret existing information on the fundamentals of the CESEE-7 in a different way and take actions which adversely affected one or more of these economies.

It should also be pointed out that what complicates the measurement of contagion in the case of the European Financial Crisis of 1931 is that any of the three contagion mechanisms discussed above may have also occurred within the CESEE-7. In other words, while we assume that financial crises in Austria, Germany and Britain were exogenous to the CESEE-7,

[67] Such behaviour may be treated as irrational [Chari and Kehoe, 2003]. It may also be rationalised in the presence of asymmetric information and fixed costs of gathering and processing country-specific information, since the latter may be costly for small investors [Calvo and Mendoza, 2000].

[68] The difference between a wake-up call and a signal extraction failure is that in the latter case financial agents assume non-existent problems while in the former they become aware of existing ones [Moser, 2003, p. 163].

contagion may have been endogenous in the CESEE-7.

A final consideration relates to a normative issue that contagion brings up. Namely, what is most worrying about contagion is the notion that even economies with sound economic fundamentals could experience financial crises. In turn, these crises can be considered unnecessary since they are not determined by underlying fundamentals [Moser, 2003, p. 164]. However, as we have seen in section 4.3.1, the CESEE-7 had weakened fundamentals before the onset of the European Financial Crisis of 1931. Hence, financial contagion, even if present, would not have been completely 'undeserved'.

## 4.4 Summary and conclusion

Financial crises in Austria, Germany and Britain during 1931 have been researched extensively. On the other hand, the experience of Eastern Europe during the European Financial Crisis of 1931 is largely unknown. Did the CESEE-7 (Bulgaria, Czechoslovakia, Greece, Hungary, Poland, Romania and Yugoslavia) experience financial crises during 1931? If so, which factors contributed these financial crises?

The occurrence of three types of financial crises - currency, banking and sovereign default risk crises were considered using newly gathered data. Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia experienced currency, banking and sovereign default risk crises during 1931, while Czechoslovakia experienced only a currency crisis. Although Czechoslovakia was geographically an Eastern European country in economic terms it was closer to the European core [Teichova, 1989]. While completely avoiding financial crises during 1931 was elusive for Eastern Europe, the case of Czechoslovakia shows that strong economic fundamentals helped downsize the extent of financial crises.

Global shocks, macroeconomic fundamentals, and international transmission played a role in these financial crises. The onset of the Great Depression brought two key changes in the global economy which lasted throughout 1931 - the drying up of international credit and falling global demand. Both were important factors driving financial crises in the CESEE-7, however they affected primary good exporters and net lenders (Bulgaria, Greece, Hungary, Poland, Romania and Yugoslavia) more than net creditors and manufacture exporters (Czechoslovakia).

To varying extent macroeconomic fundamentals were weakened in the CESEE-7 by the onset of the European Financial Crisis of 1931. In the run up to May 1931, Bulgaria, Hungary and Poland suffered a larger decline in economic activity than other CESEE countries and accordingly were the first to experience financial crises. Finance channel spillovers contributed to banking crises in Bulgaria, Romania, Poland and Yugoslavia. The banking sector of the former were exposed to international lenders who withdrew their funds following the financial crises in Austria and Germany. On the contrary, banking crises in Greece and Hungary were brought about mainly by domestic withdrawals, not least since exchange controls disabled repatriation of funds from the banking sector. Trade channel spillovers partly contributed to currency crises and increased sovereign risk in the CESEE-7 as financial crises in Austria and Germany led to a fall in exports from CESEE-7 to these large export markets and in turn reduced foreign exchange earnings.

How does the experience of Eastern Europe compare to core Western European countries such as Britain, France or Germany? Currency crises struck both Britain and Germany in 1931 [Accominotti, 2012, Ferguson and Temin, 2003, Schnabel, 2004]. The two countries responded differently to the crises. Britain left the gold standard and devalued the pound. The response of Germany was to introduce exchange controls. Similar to the German case foreign indebtedness forced most Eastern European countries to impose exchange controls without formally abandoning gold. France on the other hand did not experience currency troubles and managed to increased gold reserves between 1927 and 1932 [Irwin, 2010]. Exchange controls in Germany had repercussions for British merchant banks [Accominotti, 2012]. Eastern European banking sectors did not provide trade finance to Germany as Britain did. The direction of capital flows went in the other direction. Britain, Germany and France provided funds to banking sectors of Eastern European countries. Withdrawal of foreign short-term credits from the banking sectors of Poland, Bulgaria, Romania and Yugoslavia, to varying extent, contributed to banking crises in these countries. Sovereign risk crises seem to have been a truly emerging market phenomenon [Eichengreen, 2011, pp. 36-37] to which Britain and France were not susceptible, while the origin of German sovereign debt problems preceded 1931.

## 4.5 Appendix D - Data Appendix

**Table 4.9:** *Data for figure 4.1*

| week | bul | cze | gre | hun | pol | rom | yug |
|---|---|---|---|---|---|---|---|
| 6-May-1931 | 95.9 | 97.5 | 105.5 | 104.6 | 99.0 | 108.2 | 109.0 |
| 13-May-1931 | 103.0 | 97.3 | 101.2 | 95.7 | 100.0 | 108.2 | 100.2 |
| 20-May-1931 | 101.1 | 98.0 | 99.8 | 90.5 | | 108.3 | 107.0 |
| 27-May-1931 | 97.6 | 98.0 | 100.0 | 89.2 | 101.5 | 108.4 | 102.5 |
| 3-Jun-1931 | 95.9 | 98.1 | 97.1 | 86.7 | | 108.3 | 101.0 |
| 10-Jun-1931 | 96.4 | 96.8 | 96.5 | 79.4 | 104.6 | 106.9 | 93.1 |
| 17-Jun-1931 | 99.6 | 94.3 | 92.9 | 78.7 | 99.1 | 104.3 | 100.0 |
| 24-Jun-1931 | 98.7 | 94.6 | 93.7 | 81.3 | 99.8 | 101.7 | |
| 1-Jul-1931 | 94.2 | 93.1 | 90.8 | 83.7 | | 101.3 | 91.3 |
| 8-Jul-1931 | 93.4 | 91.3 | 87.6 | 83.0 | 98.2 | 101.7 | 89.3 |
| 15-Jul-1931 | 91.9 | 88.4 | 86.7 | 82.1 | 95.3 | 102.2 | 90.0 |
| 22-Jul-1931 | 90.6 | 86.5 | 81.1 | 81.5 | 95.1 | 102.2 | 93.3 |
| 29-Jul-1931 | 90.1 | 85.7 | 81.1 | 80.2 | | 100.3 | 92.7 |
| 5-Aug-1931 | 89.6 | 84.9 | 81.1 | 78.8 | 92.6 | 101.2 | 92.0 |
| 12-Aug-1931 | 90.0 | 83.0 | 81.7 | 77.4 | 92.7 | 102.0 | 91.3 |
| 19-Aug-1931 | 89.5 | 80.5 | 86.1 | 84.0 | | 101.2 | 93.5 |
| 26-Aug-1931 | 91.0 | 79.7 | 85.3 | 81.2 | 93.4 | 100.6 | 94.0 |
| 9-Sep-1931 | 92.6 | 78.2 | 80.7 | 81.8 | | 102.0 | 96.8 |
| 16-Sep-1931 | 91.1 | 77.5 | 85.6 | 78.7 | 93.5 | 102.7 | 88.0 |
| 23-Sep-1931 | 90.6 | 76.3 | 90.2 | 75.0 | 93.4 | 103.0 | 87.0 |
| 30-Sep-1931 | 88.1 | 73.7 | 83.6 | 74.7 | 90.0 | 101.5 | 91.3 |
| 7-Oct-1931 | 87.6 | 73.2 | 84.6 | 75.5 | | 101.1 | 91.5 |
| 14-Oct-1931 | 87.1 | 72.7 | 85.6 | 76.2 | | 99.8 | 91.6 |
| 21-Oct-1931 | 85.8 | 72.6 | 90.9 | 78.0 | 88.5 | 99.8 | 89.8 |
| 28-Oct-1931 | 88.0 | 73.1 | 90.3 | 78.2 | 87.8 | 100.9 | 103.1 |
| 4-Nov-1931 | 89.8 | 73.2 | 72.0 | 80.9 | 88.6 | 103.6 | 101.5 |
| 11-Nov-1931 | 91.2 | 75.7 | 69.7 | 81.9 | | 104.7 | 99.9 |
| 18-Nov-1931 | 92.9 | 73.1 | 70.5 | 78.5 | 88.9 | 105.2 | 95.4 |
| 25-Nov-1931 | 91.2 | 74.0 | 68.0 | 77.7 | 99.7 | 105.2 | 92.9 |
| 2-Dec-1931 | 90.8 | 74.1 | 65.4 | 77.9 | 88.9 | 103.7 | 94.3 |
| 9-Dec-1931 | 91.0 | 74.1 | 63.5 | 78.6 | | 102.4 | 93.3 |
| 16-Dec-1931 | 88.6 | 74.1 | 61.0 | 78.3 | 88.1 | 100.9 | 92.1 |
| 23-Dec-1931 | 87.6 | 73.9 | 60.1 | 79.2 | 87.9 | 99.9 | 91.0 |
| 30-Dec-1931 | 87.5 | 74.0 | 59.6 | 79.3 | 89.5 | 98.8 | 91.5 |

*Sources:* See text.

**Table 4.10:** *Data for figure 4.2*

| month | cze | gre | hun | pol | yug |
|---|---|---|---|---|---|
| Jan-31 | 98.09 | 98.91 | | | 98.78 |
| Feb-31 | 98.52 | 98.75 | 104.81 | 103.55 | 100.34 |
| Mar-31 | 99.34 | 99.56 | 102.97 | 102.10 | 100.17 |
| Apr-31 | 100.00 | 100.00 | 100.00 | 100.00 | 100.00 |
| May-31 | 100.60 | 99.26 | 101.56 | 96.38 | 99.61 |
| Jun-31 | 103.02 | 100.07 | 100.00 | 90.88 | 99.91 |
| Jul-31 | 103.76 | 98.98 | 93.42 | 86.02 | 97.69 |
| Aug-31 | 104.05 | 98.95 | 90.59 | 84.00 | 95.19 |
| Sep-31 | 104.05 | 96.14 | 87.84 | 78.93 | 90.15 |
| Oct-31 | 104.45 | 94.97 | 84.94 | 75.96 | 85.47 |
| Nov-31 | 104.91 | 94.23 | 83.31 | 74.22 | 82.26 |
| Dec-31 | 106.60 | 92.18 | 84.72 | 74.08 | 82.97 |

*Sources:* See text.

**Table 4.11:** *Data for figure 4.3*

| week | bul | cze | gre | hun | pol | rom | yug |
|---|---|---|---|---|---|---|---|
| 7-Jan-1931 | 1000 | 721 | 675 | 732 | 843 | 952 | 903 |
| 14-Jan-1931 | 979 | 719 | 671 | 728 | 833 | 915 | 892 |
| 21-Jan-1931 | 972 | 717 | 669 | 728 | 859 | 892 | 878 |
| 28-Jan-1931 | 972 | 717 | 668 | 726 | 843 | 881 | 878 |
| 4-Feb-1931 | 986 | 711 | 675 | 751 | 843 | 903 | 872 |
| 11-Feb-1931 | 986 | 711 | 672 | 749 | 819 | 875 | 867 |
| 18-Feb-1931 | 986 | 711 | 669 | 751 | 819 | 854 | 854 |
| 25-Feb-1931 | 986 | 711 | 666 | 754 | 828 | 881 | 854 |
| 4-Mar-1931 | 972 | 710 | 665 | 748 | 824 | 881 | 864 |
| 11-Mar-1931 | 940 | 710 | 665 | 748 | 819 | 881 | 836 |
| 18-Mar-1931 | 909 | 710 | 662 | 743 | 819 | 875 | 848 |
| 25-Mar-1931 | 903 | 710 | 671 | 744 | 828 | 897 | 854 |
| 1-Apr-1931 | 921 | 736 | 673 | 746 | 828 | 897 | 854 |
| 8-Apr-1931 | 940 | 734 | 669 | 743 | 824 | 903 | 856 |
| 15-Apr-1931 | 933 | 733 | 666 | 743 | 854 | 903 | 858 |
| 22-Apr-1931 | 927 | 733 | 667 | 743 | 859 | 915 | 851 |
| 29-Apr-1931 | 927 | 729 | 668 | 741 | 859 | 918 | 864 |
| 6-May-1931 | 927 | 725 | 677 | 740 | 859 | 927 | 864 |
| 13-May-1931 | 940 | 726 | 678 | 739 | 862 | 933 | 854 |
| 20-May-1931 | 986 | 726 | 674 | 741 | 875 | 959 | 870 |
| 27-May-1931 | 1014 | 724 | 674 | 742 | 881 | 959 | 886 |
| 3-Jun-1931 | 1061 | 727 | 683 | 754 | 915 | 1000 | 886 |
| 10-Jun-1931 | 1061 | 731 | 682 | 769 | 940 | 979 | 875 |
| 17-Jun-1931 | 1077 | 726 | 680 | 815 | 952 | 972 | 875 |
| 24-Jun-1931 | 1007 | 728 | 681 | 781 | 940 | 933 | 870 |
| 1-Jul-1931 | 1045 | 728 | 675 | 781 | 915 | 933 | 882 |
| 8-Jul-1931 | 1037 | 729 | 669 | 783 | 889 | 897 | 878 |
| 15-Jul-1931 | 1094 | 744 | 680 | 867 | 903 | 933 | 946 |
| 22-Jul-1931 | 1094 | 739 | 682 | 862 | 903 | 927 | 959 |
| 29-Jul-1931 | 1228 | 737 | 696 | 968 | 927 | 959 | 1116 |
| 5-Aug-1931 | 1228 | 739 | 720 | 1064 | 940 | 1014 | 1116 |
| 12-Aug-1931 | 1346 | 739 | 715 | 1042 | 979 | 1014 | 1053 |
| 19-Aug-1931 | 1321 | 742 | 693 | 980 | 972 | 1014 | 1061 |
| 26-Aug-1931 | 1346 | 742 | 689 | 993 | 972 | 1029 | 1045 |
| 2-Sep-1931 | 1489 | 744 | 701 | 993 | 1022 | 1029 | 1186 |
| 9-Sep-1931 | 1628 | 744 | 713 | 1042 | 1053 | 1077 | 1228 |
| 16-Sep-1931 | 1944 | 748 | 771 | 1200 | 1102 | 1296 | 1217 |

*Sources:* See text.

# 5 | Conclusion

Almost a century ago territories of vastly different economic development, cultural norms and historical heritage came together to form Yugoslavia. Today independent countries populate the territory that once used to be Yugoslavia but relative economic backwardness and large regional differences within the region have persisted. Research presented in the thesis analysed the economic history of interwar Yugoslavia in search of answers to present day economic under-development of this part of Europe. Three separate analytical chapters have delved into the topics of industrial location, market integration and financial crises - key forces influencing economic development of interwar Yugoslavia. Various quantitative techniques were used to analyse the new data set compiled from sources originating in the interwar period. Data processing distinguishes the present research from previous qualitative work on Yugoslav economic history [Čalić, 2004, Lampe and Jackson, 1982]. The processing of the data ranges from using descriptive statistical measures (of central tendency, dispersion or association) to panel data econometrics. The questions raised in the three analytical chapters and their main findings can be summarised as follows.

At the onset of the interwar period there was much room for industrialisation - a major force of economic development - to decrease the economic backwardness of Yugoslavia. Real national income grew over the interwar and the sector of industry and mining accounted for an increasing share of the economy [Stajić, 1959]. However, where did industry locate and what determined its location? During the 1930s industry was attracted to locate in regions that were already more developed i.e. the North-West part of the country that had higher wages, market potential and more inherited industry. Thus the gains in industrial development were regionally concentrated, which led to a deepening of regional differences in income levels. Were Yugoslav markets integrating in such a setting? If so, what was driving integration? Indeed, commodity markets across Yugoslavia were integrating during the interwar as institutional and infrastructural advancements reduced trade costs and enhanced domestic trade which in turn brought markets closer together. Nevertheless, success in economic integration should not

hide Yugoslavia's economic problems during the Great Depression. Did Yugoslavia experience financial crises during the European Financial Crisis of 1931? In 1931 financial crises swept Eastern Europe and Yugoslavia was no exception - its currency, banks and sovereign debt were in crisis. How do these new findings from Yugoslav economic history help us understand diverse outcomes in economic development of present day independent countries that once formed Yugoslavia? Moreover, how do they inform us on where the economic development of the region may be heading in the future?

Present day regional differences in economic development between Yugoslav successor states are not new. The North-Western regions of Yugoslavia that were economically most developed during the interwar (today's Slovenia and Croatia) have remained the richest regions ever since [Bolt and van Zanden, 2013]. Having persisted for at least a hundred years means that regional differences have deep historical roots that will be hard to remove. Being more developed a hundred years ago as well as today implies that the force of path dependence will stay on the side of the North-Western regions in the future. Moreover, today as in the interwar, Slovenia and Croatia have a comparative advantage in human capital over the rest of Yugoslav successor states.[69] Furthermore, by joining the European Union (EU) Slovenia and Croatia have put themselves in a position to benefit from the marked increase in their market access - one of the key forces attracting industry even beyond the interwar [Midelfart-Knarvik et al., 2000, 2001]. Following in the same footsteps seems imperative for the rest of former Yugoslavia as increased market access is a way of attracting industry in these countries. Thus the prospects for economic development of the rest of former Yugoslavia very much rest on the pace of their European integration.

Economic development of interwar Yugoslavia was not restrained by a lack of market integration. The fact that markets of Yugoslav successor states were successfully integrating in the past encourages the thinking that in the future these markets could integrate further within a political and economic union such as the EU. Similar as in the interwar there is much

[69] According to latest available World Bank data on relative shares of active population with tertiary education. See `http://databank.worldbank.org/data/home.aspx` (last accessed on 23 August 2016).

room today for institutional and infrastructural advancements in former Yugoslav states to spur economic integration. As the road to the EU necessitates such advancements, and the EU itself further promotes them after accession, economic integration within the region is expected in the future. The accession of all former Yugoslav countries to the EU would contribute to the European ideal of cultural diversity within a single political and economic union without hampering economic integration.

Yugoslavia has a long history with financial crises - the Great Depression in interwar Yugoslavia was aggravated by financial crises which negatively affected economic development. The experience of Eastern Europe during 1931 tells us that if anything strong fundamentals are the best defense from financial crises. Out of seven Eastern European countries faced with financial crises during 1931 the economically strongest of the group (Czechoslovakia) was the least affected. The same is true in the case of Yugoslav successor states during the recent global financial crisis. The economically sounder Slovenia and Croatia did not require foreign assistance as opposed to Bosnia and Herzegovina, Serbia and FYROM. Still it is true that the region as a whole has weaker fundamentals than the European North-West. It was Central, South and South East European countries that required financial assistance from sounder European economies during the global financial crisis. Hence being part of the EU is no panacea when it comes to financial crises. Yet being able to rely on as much foreign assistance as possible may be crucial in alleviating and resolving a financial crisis. The history of financial crises in Yugoslavia should remind both domestic governments and foreign supranational institutions to reserve ample funds for assistance in case of future financial crises given the still relatively weak economic fundamentals of Yugoslav successor states.

The relative economic backwardness of former Yugoslav states assures that future research on Yugoslav economic history will remain concentrated on topics concerned with economic development. The present thesis has laid the groundwork for future research to explore Yugoslav interwar economic development. A multitude of research avenues can be taken from this point. For example, the picture of regional economic development in twentieth century Europe is emerging [Badia-Miró et al., 2012, Buyst, 2011, Combes et al., 2011, Crafts,

2005b, Felice, 2011, Henning et al., 2011, Rosés et al., 2010]. A long term view of Yugoslav regional development can be attained by connecting the first estimates of regional GDP of interwar Yugoslavia with the available post-1952 estimates [Bolt and van Zanden, 2013]. The link between regional economic development and market potential [Head and Mayer, 2006, Martinez-Galarraga et al., 2015, Missiaia, 2016] in Yugoslavia can be explored using the new calculations of Yugoslav market potential. Newly collected data series on employment and income open the possibility to calculate income inequality in Yugoslavia based on static [Lindert and Williamson, 1982, 1983, Milanovic et al., 2011] or dynamic [Weber, 2014] social tables.

To conclude, interwar Yugoslavia is more than ready to be discovered by New Economic History research. The new data set collected for the purpose of the present thesis is evidence that new economic history of interwar Yugoslavia can be written. Moreover, as the present thesis shows, new economic history of interwar Yugoslavia should be written as it allows us to better understand the least developed part of Europe today and suggest possible remedies for its economic development. Finally, new economic history of interwar Yugoslavia has a bright outlook in which explaining income inequalities across regions and social classes - questions deeply relevant for Europe today - is expected to be high on the research agenda in the future.

# Sources

## Yugoslav data sources

Demokratska Federativna Jugoslavija, 1945. Industrijska statistika: Rezultati industrijskog popisa iz 1939. godine: III Utrošeno gorivo [Industrial statistics: Results of the industrial census from the year 1939: fuel consumed]. Državni statistički ured.

FNR Jugoslavija, 1951. Konačni rezultati popisa stanovništva, 1948(knjiga I) [Definitive results of the population census, 1948 (book I)]. Savezni zavod za statistiku i evidenciju.

FNR Jugoslavija, 1954. Konačni rezultati popisa stanovništva, 1948(knjiga III) [Definitive results of the population census, 1948 (book III)]. Savezni zavod za statistiku i evidenciju.

Jugoslovenske državne železnice, 1930. Statistika jugoslovenskih železnica za godinu 1929 sa usporednim podacima za godinu 1928 [Statistics of Yugoslav railways for the year 1929 with comparable data for the year 1928]. Beograd.

Jugoslovenske državne železnice, 1934. Statistika jugoslovenskih železnica za godinu 1933 sa usporednim podacima za godinu 1932 [Statistics of Yugoslav railways for the year 1933 with comparable data for the year 1932]. Beograd.

Jugoslovenske državne železnice, 1938. Statistika jugoslovenskih železnica za godinu 1938 sa usporednim podacima za godinu 1937 [Statistics of Yugoslav railways for the year 1938 with comparable data for the year 1937]. Beograd.

Kraljevina Jugoslavija, 1932. Definitivni rezultati popisa stanovništva, 1921 [Definitive results of the population census, 1921]. Opšta državna statistika.

Kraljevina Jugoslavija, 1932-1941. Statistički godišnjak, 1929 - 1940 (knjige I-X) [Statistical yearbook, 1929-1940 (books I-X)]. Opšta državna statistika.

Kraljevina Jugoslavija, 1937. Definitivni rezultati popisa stanovništva, 1931 (knjiga I) [Definitive results of the population census, 1931 (book I)]. Opšta državna statistika.

Kraljevina Jugoslavija, 1938a. Definitivni rezultati popisa stanovništva, 1931 (knjiga II) [Definitive results of the population census, 1931 (book II)]. Opšta državna statistika.

Kraljevina Jugoslavija, 1938b. Definitivni rezultati popisa stanovništva, 1931 (knjiga III) [Definitive results of the population census, 1931 (book III)]. Opšta državna statistika.

Kraljevina Jugoslavija, 1940. Definitivni rezultati popisa stanovništva, 1931 (knjiga IV) [Definitive results of the population census, 1931 (book IV)]. Opšta državna statistika.

Kukoleča, S., 1941. Industrija Jugoslavije, 1918-1938 [Industry of Yugoslavia, 1918-1938]. Balkanska štampa.

Ministarstvo poljoprivrede, 1924-1931. Obradjena zemlja i žetveni prinos [Farmland and crop yield]. Beograd.

Ministarstvo saobraćaja, 1925a. Daljinar železnica u Kraljevini Srba, Hrvata i Slovenaca [Railway distances in the Kingdom of Serbs, Croats and Slovenes]. Beograd.

Ministarstvo saobraćaja, 1925b. Železnička tarifa Kraljevine Srba, Hrvata i Slovenaca [Railway tariff of the Kingdom of Serbs, Croats and Slovenes]. Beograd.

Ministarstvo saobraćaja, 1930. Daljinar za pruge jugoslovenskih državnih železnica [Distance tables for Yugoslav state railways]. Beograd.

Ministarstvo saobraćaja, 1933a. Daljinar za pruge jugoslovenskih državnih železnica [Distance tables for Yugoslav state railways]. Beograd.

Ministarstvo saobraćaja, 1933b. Tarifa za prevoz robe na prugama jugoslovenskih državnih železnica [Tariff for transporting goods on Yugoslav state railways]. Beograd.

Ministarstvo saobraćaja, 1935. Daljinar za pruge jugoslovenskih državnih železnica, Sveska 1 [Distance tables for Yugoslav state railways, Notebook 1]. Beograd.

Ministarstvo saobraćaja, 1937. Daljinar za pruge jugoslovenskih državnih železnica, Sveska 2 [Distance tables for Yugoslav state railways, Notebook 2]. Beograd.

Ministarstvo saobraćaja, 1938. Tarifa za prevoz robe na prugama jugoslovenskih državnih železnica [Tariff for transporting goods on Yugoslav state railways]. Beograd.

Ministarstvo trgovine i industrije, 1941. Statistika industrije Kraljevine Jugoslavije, sa adresarom industriskih preduzeća [Industrial statistics of the Kingdom of Yugoslavia, with an address book of industrial firms]. Beograd.

Narodna Banka Kraljevine Jugoslavije, 1935. Narodna Banka 1884-1934 [National Bank 1884-1934]. Zavod za izradu novčanica, Topčider.

Naronda Banka Kraljevine Jugoslavije, 1933-1939. Godišnji izveštaj [Annual Report]. Državna štamparija Kraljevine Jugoslavije.

National Bank of the Kingdom of Yugoslavia, 1929-1938. Quarterly Bulletin. Belgrade: National Bank of the Kingdom of Yugoslavia.

Petrović, N., 1957. Medjusobni odnosi privrednih delatnosti Jugoslavije u 1955. godini [Economic input-output relations for Yugoslavia in the year 1955]. Savezni zavod za statistiku.

Radnička komora za Hrvatsku i Slavoniju, 1929-1941. Indeks [Index]. Zagreb.

Središni ured za osiguranje radnika, 1932-1941. Radnička zaštita : službeni list Središnog ureda za osiguranje radnika u Zagrebu [Protection of Workers: official journal of the Central Office for the Insurance of Workers in Zagreb]. Zagreb.

Uprava za zaštitu industrijske svojine, 1921-1941. Glasnik Uprave za zaštitu industrijske svojine [Gazette of the Directorate for the protection of industrial property]. Beograd.

### Other Yugoslav sources

Cugmus, J., 1929. Tarifna politika naših državnih železnica. U: Jubilarna knjiga Državnih Železnica Kraljevine Jugoslavije [Tariff policy of state railways. In: State railways of the Kingdom of Yugoslavia jubilee book]. Beograd.

Dukanac, L. S., 1946. Indeksi konjunkturnog razvoja Jugoslavije, 1919-1941 [Yugoslav business cycles (index numbers), 1919-1941]. Beogradska trgovinska komora.

Ministarstvo finansija, 1939. Ministarstvo finansija 1918-1938 [Ministry of Finance 1918-1938]. Beograd.

Mirković, M., 1950. Ekonomska struktura Jugoslavije: 1918-1941 [Economic Structure of Yugoslavia: 1918-1941]. Zagreb : Nakladni zavod Hrvatske.

Naronda Banka Kraljevine Jugoslavije, 1932. Godišnji izveštaj za 1931 godinu [Annual Report for 1931]. Državna štamparija Kraljevine Jugoslavije.

Paskojević, M., 1937. Statistička služba u Jugoslaviji [Statistical service in Yugoslavia] . Socijalni Arhiv 3, 157–175.

Rozenberg, V., 1937. Inostrani kapital u jugoslovenskoj privredi: u bankarstvu, industriji, trgovini, transportu, osiguranju i ostalim granama privredne delatnosti [Foreign capital in the yugoslav economy: in banking, industry, commerce, transportation, insurance and other branches of economic activity]. Beograd: Privredni pregled.

Stajić, S., 1959. Nacionalni dohodak Jugoslavije 1923-1939. u stalnim i tekućim cenama [National income of Yugoslavia 1923-1939 in constant and current prices]. Ekonomski institut.

Stefanović, M., 1929. Naše železnice posle rata 1918-1928 [Our state railways after the war 1918-1928]. Geca Kon.

Vučo, N., 1968. Agrarna kriza u Jugoslaviji [Agricultural crisis in Yugoslavia] 1930-1934. Prosveta.

### International sources

Banque Nationale de Bulgarie, 1931. Bulletin Mensuel. No. 5. Sofia: Banque Nationale de Bulgarie.

Bolt, J., van Zanden, J. L., 2013. The first update of the maddison project; re-estimating growth before 1820. Maddison-Project Working Paper WP-4, University of Groningen, January 5.

Broadberry, S., Klein, A., 2012. Aggregate and per capita gdp in europe, 1870–2000: continental, regional and national data with changing boundaries. Scandinavian economic history review 60 (1), 79–107.

Conolly, F. G., 1936. Memorandum on the international short-term indebtedness. In: Carnegie Endowment for International Peace and International Chamber of Commerce (Ed.), The improvement of commercial relations between nations and the problems of monetary stabilization. Paris, pp. 338–355.

Cook, T., 1939. Cook's Continental Timetable: A New Edition of the August 1939 Issue of Cook's Continental Timetable with Enlarged Type and Introduction by JH Price. David and Charles.

Ellis, H. S., 1939. Exchange Control in Austria and Hungary. The Quarterly Journal of Economics 54 (1), 1–185.

Ellis, H. S., 1940. German Exchange Controls, 1931–1939: From an Emergency Measure to a Totalitarian Institution. The Quarterly Journal of Economics 54 (4), 1–158.

Ellis, H. S., 1941. Exchange control in Central Europe.

League of Nations, 1926-1944. Statistical Yearbooks. Geneva: League of Nations.

League of Nations, 1931a. Statistical Year-book of the League of Nations 1930/31. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1931b. The Course and Phases of the World Economic Depression, Report presented to the Assembly of the League of Nations (Revised Edition). Geneva: League of Nations.

League of Nations, 1932a. Memorandum on Trade and Balances of Payments, 1930: Vol.III. International Trade Statistics 1930. Geneva: League of Nations.

League of Nations, 1932b. Monthly Bulletin of Statistics. Vol. 13(3). Geneva: League of Nations.

League of Nations, 1932c. Monthly Bulletin of Statistics. Vol. 13(12). Geneva: League of Nations.

League of Nations, 1932d. Report by the Stresa Conference for the Economic Restoration of Central and Eastern Europe, Submitted to the Commission of Enquiry for European Union. Geneva: League of Nations.

League of Nations, 1932e. Statistical Year-book of the League of Nations 1931/32. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1933. International Trade Statistics 1931 and 1932. Geneva: League of Nations.

League of Nations, 1934a. Commercial Banks, 1925-1933, Series of League of Nations Publications, I: Economic and Financial. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1934b. Statistical Year-book of the League of Nations 1933/34. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1935. Commercial Banks, 1929-1934, Series of League of Nations Publications, II: Economic and Financial. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1936. Statistical Year-book of the League of Nations 1935/36. Geneva: League of Nations, Economic Intelligence Service.

League of Nations, 1940. Statistical Year-book of the League of Nations 1939/40. Geneva: League of Nations, Economic Intelligence Service.

LoN, various. Monthly Bulletin of Statistics. Geneva: League of Nations.

Maddison, A., 2003. The World Economy: Historical Statistics. OECD Publishing, Development Centre Studies.

Maddison, A., 2010. Statistics on World Population, GDP and Per Capita GDP, 1-2008 AD. http://www.ggdc.net/maddison/maddison-project/orihome.htm.

Mitchell, B., 2013. International Historical Statistics. Edited by Palgrave Macmillan Ltd. http://www.palgraveconnect.com/pc/doifinder/10.1057/9781137305688.

Nurkse, R., 1944. International currency experience: lessons of the interwar period. No. 4. League of Nations.

Rist, C., Schwob, P., 1936. Memorandum on the depression experience of gold block countries. In: Carnegie Endowment for International Peace and International Chamber of Commerce (Ed.), The improvement of commercial relations between nations and the problems of monetary stabilization. Paris, pp. 223–243.

SEEMHN, 2014. South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II. BoG, BNB, NBR, ONB. https://www.oenb.at/en/Publications/Economics/south-east-european-monetary-history-network-data-volume.html.

Statistisches Reichsamt, 1936. Statistisches Handbuch der Weltwirtschaft. Berlin: Verlag für Sozialpolitik, Wirtscahft und Statistik.

Statistisches Reichsamt, 1937. Statistisches Handbuch der Weltwirtschaft. Berlin: Verlag für Sozialpolitik, Wirtscahft und Statistik.

The Economist, 1931. Vol. 112(4558)-113(4609). London.

The Financial Times, 1931. No. 13096 - 13402. London.

The London Stock Exchange, 1929. The Investor's Monthly Manual. Vol. 59(12). London: The London Stock Exchange.

## Literature

Accominotti, O., 2012. London Merchant Banks, the Central European Panic, and the Sterling Crisis of 1931. The Journal of Economic History 72 (01), 1–43.

Accominotti, O., Eichengreen, B., 2016. The mother of all sudden stops: capital flows and reversals in Europe, 1919–32. The Economic History Review 69 (2), 469–492.

Albers, T., Uebele, M., 2015. The Global Impact of the Great Depression. London School of Economics and Political Science WP No.218.

Aldcroft, D., Morewood, S., 1995. Economic change in Eastern Europe since 1918. Edward Elgar Aldershort.

Allen, F., Gale, D., 2000. Financial Contagion. Journal of Political Economy 108 (1), 1–33.

Arellano, M., Bond, S., 1991. Some tests of specification for panel data: Monte carlo evidence and an application to employment equations. The Review of Economic Studies 58 (2), 277–297.

Badia-Miró, M., Guilera, J., Lains, P., 2012. Regional incomes in Portugal: industrialisation, integration and inequality, 1890-1980. Revista de Historia Económica/Journal of Iberian and Latin American Economic History (New Series) 30 (02), 225–244.

Baicu, C. G., Mauri, A., 2010. Le Istituzioni Finanziarie Della Romania Nel Periodo Infrabellico (Financial Institutions in Interwar Romania). Universitá Degli Studi di Milano, Dipartimento di Scienze Economiche Aziendali e Statistiche Working Paper (2010-03).

Balderston, T., 1994. The Banks and the Gold Standard in the German Financial Crisis of 1931. Financial history review 1 (01), 43–68.

Berend, I., Ranki, G., 1974. Economic development in East-Central Europe in the nineteenth and twentieth centuries. New York: Columbia University.

Bernanke, B., James, H., 1991. The Gold Standard, Deflation, and Financial Crisis in the

Great Depression: An International Comparison. In: Financial Markets and Financial Crises. University of Chicago Press, pp. 33–68.

Bićanić, I., Škreb, M., 1994. The Yugoslav Economy from Amalgamation to Disintegration. In: Good, D. F. (Ed.), Economic Transformations in East and Central Europe: Legacies from the Past and Policies for the Future. Routledge, pp. 147–162.

Brülhart, M., 1998. Economic Geography, Industry Location and Trade: The Evidence. The World Economy 21 (6), 775–801.

Bry, G., Boschan, C., et al., 1971. Cyclical Analysis of Time Series: Selected Procedures and Computer Programs. National Bureau of Economic Research.

Buyst, E., 2011. Continuity and change in regional disparities in Belgium during the twentieth century. Journal of Historical Geography 37 (3), 329–337.

Buyst, E., Franaszek, P., 2010. Sectoral developments, 1914–1945. In: Broadberry, S. N., O'Rourke, K. H. (Eds.), The Cambridge Economic History of Modern Europe: Volume 2, 1870 to the Present. Cambridge University Press, pp. 208–31.

Čalić, M., 2004. Socijalna istorija Srbije 1815-1941: usporeni napredak u industrijalizaciji [Social history of Serbia 1815-1941: Slow progress in industrialisation]. Clio.

Čalić, M.-J., 2013. Istorija Jugoslavije u 20. veku [History of Yugoslavia in the 20th century]. Clio.

Calvo, G. A., Mendoza, E. G., 2000. Rational contagion and the globalization of securities markets. Journal of International Economics 51 (1), 79–113.

Caramazza, F., Ricci, L., Salgado, R., 2004. International Financial Contagion in Currency Crises. Journal of International Money and Finance 23 (1), 51–70.

Chari, V. V., Kehoe, P. J., 2003. Hot money. Journal of Political Economy 111 (6), 1262–1292.

Christodoulakis, N., 2013. Currency crisis and collapse in interwar greece: predicament or policy failure? European Review of Economic History 17 (3), 272–293.

Claessens, S., Dornbusch, R., Park, Y. C., 2001. Contagion: Why crises spread and how this can be stopped. In: Claessens, S., Forbes, K. (Eds.), International Financial Contagion. Springer, pp. 19–41.

Combes, P.-P., Lafourcade, M., Thisse, J.-F., Toutain, J.-C., 2011. The rise and fall of spatial inequalities in France: A long-run perspective. Explorations in Economic History 48 (2), 243–271.

Corsetti, G., Pesenti, P., Roubini, N., Tille, C., 2000. Competitive devaluations: toward a welfare-based approach. Journal of International Economics 51 (1), 217–241.

Crafts, N., 2005a. Market potential in British regions, 1871–1931. Regional Studies 39 (9), 1159–1166.

Crafts, N., 2005b. Regional GDP in Britain, 1871–1911: some estimates. Scottish Journal of Political Economy 52 (1), 54–64.

Crafts, N., Mulatu, A., 2005. What explains the location of industry in Britain, 1871–1931? Journal of Economic Geography 5 (4), 499–518.

Crafts, N., Mulatu, A., 2006. How did the location of industry respond to falling transport costs in Britain before World War I? Journal of Economic History 66 (3), 575–607.

Crafts, N., Wolf, N., 2014. The location of the UK Cotton Textiles Industry in 1838: A Quantitative Analysis. The Journal of Economic History 74 (04), 1103–1139.

David, P. A., 1975. Technical choice innovation and economic growth: essays on American and British experience in the nineteenth century. Cambridge University Press.

David, P. A., 1985. Clio and the Economics of QWERTY. The American Economic Review, 332–337.

David, P. A., 2007. Path dependence: a foundational concept for historical social science. Cliometrica 1 (2), 91–114.

Davis, D. R., Weinstein, D. E., 1999. Economic geography and regional production structure: An empirical investigation. European Economic Review 43 (2), 379–407.

Davis, D. R., Weinstein, D. E., 2003. Market access, economic geography and comparative advantage: an empirical test. Journal of International Economics 59 (1), 1–23.

Dimitrova, K., Ivanov, M., 2014. Bulgaria: from 1879 to 1947. In: South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II. BoG, BNB, NBR, ONB, pp. 199–242.

Drabek, Z., 1986. Foreign Trade Performance and Policy. In: Kaser, M., Radice, E. (Eds.), The Economic History of Eastern Europe, 1919-1975: Economic structure and performance between the two wars. Vol. 1. Oxford University Press, USA, pp. 379–531.

Dungey, M., Tambakis, D., 2005. Identifying International Financial Contagion: Progress and Challenges. Oxford University Press.

Eckstein, A., 1955. National Income and Capital Formation in Hungary, 1900–1950. Review of Income and Wealth 5 (1), 152–223.

Eichengreen, B., 1992. Golden Fetters: The Gold Standard and the Great Depression, 1919-1939. Oxford University Press.

Eichengreen, B., 2011. The New Monetary and Financial History. In: Wood, Geoffrey, M. T., Crafts, N. (Eds.), Monetary and banking history: essays in honour of Forrest Capie. Taylor & Francis, pp. 27–48.

Eichengreen, B., Hausmann, R., Panizza, U., 2007. Currency Mismatches, Debt Intolerance, and The Original Sin: Why They Are Not the Same and Why It Matters. In: Capital Controls and Capital Flows in Emerging Economies: Policies, Practices and Consequences. University of Chicago Press, pp. 121–170.

Eichengreen, B., Rose, A. K., 1999. Contagious Currency Crises: Channels of Conveyance. In: Changes in Exchange Rates in Rapidly Developing Countries: Theory, Practice, and Policy Issues (NBER-EASE volume 7). University of Chicago Press, pp. 29–56.

Eichengreen, B. J., Rose, A. K., Wyplosz, C., 1996. Contagious Currency Crises: First Tests. Scandinavian Journal of Economics 98 (4), 463–84.

Ellison, G., Glaeser, E. L., 1999. The Geographic Concentration of Industry: Does Natural Advantage Explain Agglomeration? American Economic Review, 311–316.

Engel, C., Rogers, J. H., 1996. How Wide Is the Border? The American Economic Review 86 (5), 1112–1125.

Estevadeordal, A., Frantz, B., Taylor, A. M., 2003. The Rise and Fall of World Trade, 1870–1939. The Quarterly Journal of Economics 118 (2), 359–407.

Federico, G., 2007. Market integration and market efficiency: the case of 19th century Italy. Explorations in Economic History 44 (2), 293–316.

Federico, G., 2011. When did European markets integrate? European Review of Economic History 15 (1), 93–126.

Federico, G., 2012. How much do we know about market integration in Europe? The Economic History Review 65 (2), 470–497.

Federico, G., Persson, K. G., 2007. Market Integration and Convergence in the World Wheat Market, 1800–2000. The new comparative economic history: essays in honor of Jeffrey G. Williamson, 87–113.

Federico, G., Sharp, P., 2013. The cost of railroad regulation: the disintegration of American agricultural markets in the interwar period. The Economic History Review 66 (4), 1017–1038.

Feinstein, C. H., Temin, P., Toniolo, G., 2008. The World Economy between the World Wars. Oxford University Press.

Felice, E., 2011. Regional value added in italy, 1891–2001, and the foundation of a long-term picture. The Economic History Review 64 (3), 929–950.

Ferguson, T., Temin, P., 2003. Made in Germany: the Currency Crisis of 1931. Research in Economic History 31, 1–53.

Flores, J., Decorzant, Y., 2012. Public borrowing in harsh times: The League of Nations loans revisited. University of Geneva. Department of Economics Working Paper Series no 2091.

Flores Zendejas, J. H., Decorzant, Y., 2015. Going multilateral? Financial markets' access and the League of Nations loans, 1923–8. The Economic History Review.

Forbes, K. J., 2002. Are Trade Linkages Important Determinants of Country Vulnerability to Crises? In: Edwards, S., Frankel, J. A. (Eds.), Preventing Currency Crises in Emerging Markets. University of Chicago Press, pp. 77–132.

Geary, F., Stark, T., 2002. Examining Ireland's Post-Famine Economic Growth Performance. The Economic Journal 112 (482), 919–935.

Gerlach, S., Smets, F., 1995. Contagious speculative attacks. European Journal of Political Economy 11 (1), 45–63.

Girton, L., Roper, D., 1977. A monetary model of exchange market pressure applied to the postwar Canadian experience. The American Economic Review 67 (4), 537–548.

Gnjatović, D., 1991. Stari državni dugovi: prilog ekonomskoj i političkoj istoriji Srbije i Jugoslavije 1862-1941 [Old state debts: a contribution to the economic and political history of Serbia and Yugoslavia 1862-1941]. Ekonomski institut i Jugoslovenski pregled [Economic Institute and Yugoslav Review].

Goldstein, M., 1998. The Asian Financial Crisis: Causes, Cures, and Systemic Implications. Vol. 55. Peterson Institute.

Grossman, R. S., 1994. The shoe that didn't drop: explaining banking stability during the Great Depression. The Journal of Economic History 54 (03), 654–682.

Head, K., Mayer, T., 2006. Regional wage and employment responses to market potential in the EU. Regional Science and Urban Economics 36 (5), 573–594.

Henning, M., Enflo, K., Andersson, F. N., 2011. Trends and cycles in regional economic growth:

How spatial differences shaped the swedish growth experience from 1860–2009. Explorations in Economic History 48 (4), 538–555.

Hinić, B., Đurđević, L., Šojić, M., 2014. Serbia/Yugoslavia: from 1884 to 1940. In: South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II. BoG, BNB, NBR, ONB, pp. 291–354.

Irwin, D. A., 2010. Did france cause the great depression? Tech. rep., National Bureau of Economic Research.

Irwin, D. A., 2012. Trade Policy Disaster: lessons from the 1930s. MIT press.

Ivanov, M., Tooze, A., 2007. Convergence or decline on Europe's southeastern periphery? Agriculture, population, and GNP in Bulgaria, 1892–1945. The Journal of Economic History 67 (03), 672–703.

James, H., 1984. The Causes of the German Banking Crisis of 1931. The Economic History Review 37 (1), 68–87.

Kaminsky, G. L., Reinhart, C. M., 2000. On Crises, Contagion, and Confusion. Journal of International Economics 51 (1), 145–168.

Kaser, M., Radice, E., 1985. The Economic History of Eastern Europe, 1919-1975: Economic Structure and Performance between the two Wars. Vol. 1. Oxford University Press, USA.

Kaser, M., Radice, E., 1986a. The Economic History of Eastern Europe, 1919-1975: Interwar Policy, the War and Reconstruction. Vol. 2. Oxford University Press, USA.

Kaser, M., Radice, E., 1986b. The Economic History of Eastern Europe, 1919-1975: Intstitutional Change Within a Planned Economy. Vol. 3. Oxford University Press, USA.

Keeble, D., Owens, P. L., Thompson, C., 1982. Regional accessibility and economic potential in the European Community. Regional Studies 16 (6), 419–432.

Kim, S., 1995. Expansion of Markets and the Geographic Distribution of Economic Activities:

The Trends in US regional Manufacturing Structure, 1860-1987. The Quarterly Journal of Economics, 881–908.

Kim, S., 1999. Regions, resources, and economic geography: Sources of US regional comparative advantage, 1880–1987. Regional Science and Urban Economics 29 (1), 1–32.

Kindleberger, C. P., 1978. Manias, Panics and Crashes: A History of Financial Crashes. New York: Basic Books, Inc.

Kindleberger, C. P., 1986. The World in Depression, 1929-1939. University of California Press.

Kindleberger, C. P., Aliber, R. Z., 2011. Manias, Panics and Crashes: A History of Financial Crises. Palgrave Macmillan.

Kirk, D., 1969. Europe's Population in the Interwar Years. Vol. 3. Taylor & Francis.

Klein, A., Crafts, N., 2012. Making sense of the manufacturing belt: determinants of US industrial location, 1880–1920. Journal of Economic Geography 12 (4), 775–807.

Krugman, P., 1991a. Geography and trade. MIT press.

Krugman, P., 1991b. Increasing Returns and Economic Geography. The Journal of Political Economy 99 (3), 483–499.

Krugman, P., 1993. First Nature, Second Nature, and Metropolitan Location. Journal of Regional Science 33 (2), 129–144.

Krugman, P., Venables, A. J., 1995. Globalization and the Inequality of Nations. The Quarterly Journal of Economics 110 (4), 857–880.

Lampe, J., 2000. Yugoslavia as History: Twice There Was a Country. Cambridge University Press.

Lampe, J., Jackson, M., 1982. Balkan Economic History, 1550-1950: From Imperial Borderlands to Developing Nations. Bloomington: Indiana University Press.

Lampe, J. R., 1980. Unifying the Yugoslav Economy, 1918-1921: Misery and Early Misunderstandings. In: Djordjević, D. (Ed.), The Creation of Yugoslavia: 1914-1918. Santa Barbara, Calif.: Clio Books, pp. 139–142.

Lazaretou, S., 2011. Financial crises and financial market regulation: the long record of an 'emerger'. Bank of Greece Working Paper (140).

Lazaretou, S., 2014. Greece: from 1833 to 1949. In: South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II. BoG, BNB, NBR, ONB, pp. 101–170.

Lethbridge, E., 1985. National Income and Product. In: Kaser, M., Radice, E. (Eds.), The Economic History of Eastern Europe, 1919-1975: Economic structure and performance between the two wars. Vol. 1. Oxford University Press, USA, pp. 532–598.

Lindert, P. H., Williamson, J. G., 1982. Revising england's social tables 1688–1812. Explorations in Economic History 19 (4), 385–408.

Lindert, P. H., Williamson, J. G., 1983. Reinterpreting britain's social tables, 1688–1913. Explorations in Economic History 20 (1), 94–109.

Martínez-Galarraga, J., 2012. The determinants of industrial location in Spain, 1856–1929. Explorations in Economic History 49, 255–275.

Martinez-Galarraga, J., Tirado, D. A., González-Val, R., 2015. Market potential and regional economic growth in Spain (1860–1930). European Review of Economic History 19 (4), 335–358.

Masson, P., 1999a. Contagion: macroeconomic models with multiple equilibria. Journal of International Money and Finance 18 (4), 587–602.

Masson, P., 1999b. Contagion: Monsoonal Effects, Spillovers, and Jumps Between Multiple Equilibria. In: Pierre-Richard Agénor, Marcus Miller, D. V. A. W. (Ed.), The Asian Financial Crisis: Causes, Contagion and Consequences. Cambridge University Press, pp. 121–188.

Midelfart-Knarvik, K., Overman, H., Redding, S., Venables, A., 2000. The Location of European Industry. Report prepared to the Directorate General for Economic and Financial Affairs, European Commission. Economic papers 142.

Midelfart-Knarvik, K., Overman, H., Venables, A., 2001. Comparative advantage and economic geography: estimating the determinants of industrial location in the EU. Centre for Economic Policy Research, London School of Economics and Political Science.

Milanovic, B., Lindert, P. H., Williamson, J. G., 2011. Pre-industrial inequality. The Economic Journal 121 (551), 255–272.

Ministarstvo finansija, 1939. Ministarstvo finansija 1918-1938 [Ministry of Finance 1918-1938]. Beograd.

Missiaia, A., 2016. Where do we go from here? Market access and regional development in Italy (1871–1911). European Review of Economic History 20 (2), 215–241.

Mitrović, A., 2003. The Yugoslav Question, the First World War and the Peace Conference, 1914–20. In: Djokić, D. (Ed.), Yugoslavism: Histories of a Failed Idea, 1918-1992. University of Wisconsin Press, pp. 42–56.

Morys, M., 2013. Discount rate policy under the classical gold standard: Core versus periphery (1870s–1914). Explorations in Economic History 50 (2), 205–226.

Morys, M., Ivanov, M., 2015. The emergence of a European region: Business cycles in South-East Europe from political independence to World War II. European Review of Economic History 19 (4), 382–411.

Moser, T., 2003. What Is International Financial Contagion? International Finance 6 (2), 157–178.

North, D. C., 1990. Institutions, institutional change and economic performance. Cambridge University Press.

Notel, R., 1986. International Credit and Finance. In: Kaser, M., Radice, E. (Eds.), The Economic History of Eastern Europe, 1919-1975: Interwar policy, the war and reconstruction. Vol. 2. Oxford University Press, USA, pp. 170–286.

Obstfeld, M., Taylor, A. M., 2003. Sovereign risk, credibility and the gold standard: 1870–1913 versus 1925–31. The Economic Journal 113 (487), 241–275.

Ohlin, B. G., 1933. Interregional and international trade. Harvard University Press.

Pericoli, M., Sbracia, M., 2003. A Primer on Financial Contagion. Journal of Economic Surveys 17 (4), 571–608.

Pollard, S., 1981. Peaceful Conquest: The Industrialization of Europe, 1760-1970. Oxford; New York: Oxford University Press.

Redding, S. J., 2010. The Empirics of New Economic Geography. Journal of Regional Science 50 (1), 297–311.

Ritschl, A., Sarferaz, S., 2014. Currency versus banking in the financial crisis of 1931. International Economic Review 55 (2), 349–373.

Roodman, D., 2009. How to do xtabond2: An introduction to difference and system GMM in Stata. The Stata Journal 9 (1), 86–136.

Rosés, J. R., 2003. Why isn't the whole of Spain industrialized? New economic geography and early industrialization, 1797–1910. The Journal of Economic History 63 (04), 995–1022.

Rosés, J. R., Martínez-Galarraga, J., Tirado, D. A., 2010. The upswing of regional income inequality in spain (1860–1930). Explorations in Economic History 47 (2), 244–257.

Schnabel, I., 2004. The German Twin Crisis of 1931. The Journal of Economic History 64 (03), 822–871.

Schubert, A., 1991. The Credit-Anstalt Crisis of 1931. Cambridge University Press.

Schulze, M.-S., Wolf, N., 2012. Economic nationalism and economic integration: the Austro-Hungarian Empire in the late nineteenth century. The Economic History Review 65 (2), 652–673.

Stoenescu, G. V., Aloman, A., Blejan, E., Costache, B., 2014. Romania: from 1880 to 1947. In: South-Eastern European Monetary and Economic Statistics from the Nineteenth Century to World War II. BoG, BNB, NBR, ONB, pp. 243–290.

Stoenescu, G. V., Blejan, E., Costache, B., Iarovici, A., 2007. Foreign Exchange Regime in Romania between 1929 and 1939. In: The Experience of Exchange Rate Regimes in Southeastern Europe in a Historical and Comparative Perspective (Conference proceedings of the 2nd meeting of the South-Eastern European Monetary History Network). OeNB, pp. 244–260.

Teichova, A., 1989. East central and south-east europe, 1919-1939. In: Mathias, P., Pollard, S. (Eds.), The Cambridge Economic History of Europe: The Industrial Economies: The Development of Economic and Social Policies. Vol. 8. Cambridge University Press, pp. 887–983.

Temin, P., 2008. The German crisis of 1931: evidence and tradition. Cliometrica 2 (1), 5–17.

Tooze, A., Ivanov, M., 2011. Disciplining the 'black sheep of the Balkans': financial supervision and sovereignty in Bulgaria, 1902–38. The Economic History Review 64 (1), 30–51.

United Nations, 1949. International Capital Movements during the Inter-War Period. Lake Success, NY: United Nations.

Van Rijckeghem, C., Weder, B., 2001. Sources of contagion: is it finance or trade? Journal of International Economics 54 (2), 293–308.

Venables, A. J., 1996. Equilibrium locations of vertically linked industries. International economic review, 341–359.

Wachtel, A., 1998. Making a Nation, Breaking a Nation: Literature and Cultural Politics in Yugoslavia. Stanford University Press.

Weber, J. E. R., 2014. La economía política de la desigualdad de ingreso en Chile, 1850-2009. Tesis de Doctorado en Historia Económica, Programa de Historia Económica y Social. Facultad de Ciencias Sociales, Universidad de la República, Uruguay.

Williams, D., 1963a. London and the 1931 Financial Crisis. The Economic History Review 15 (3), 513–528.

Williams, D., 1963b. The 1931 Financial Crisis. Bulletin of Economic Research 15 (2), 92–110.

Wolf, N., 2007a. Endowments vs. market potential: What explains the relocation of industry after the Polish reunification in 1918? Explorations in Economic History 44, 22–42.

Wolf, N., 2007b. Should I stay or should I go? Understanding Poland's adherence to gold, 1928-1936. Historical Social Research/Historische Sozialforschung 32 (4), 351–368.

Wolf, N., 2008. Scylla and Charybdis. explaining Europe's exit from gold, January 1928–December 1936. Explorations in Economic History 45 (4), 383–401.

Wolf, N., 2009. Was Germany ever united? Evidence from intra-and international trade, 1885–1933. The Journal of Economic History 69 (03), 846–881.