Essays on the Economics of Social Capital and Institutions

Victor Gulde Codeceira

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Abstract

A growing body of theoretical and empirical work has shown that culture matters for institutions and socio-economic outcomes. This thesis contributes to the growing economic literature that investigates the relationship between cultural norms & values, institutions and socio-economic outcomes. Each of its three chapters presents a separate essay.

Chapter 2 reconsiders the relationship between trust and democratisation. Despite extensive literature that investigates the determinants of democratisation, the question of why some countries develop democratic institutions remain open. Modernisation theory argues that economic growth and development is the driving force behind democratisation (Lipset, 1959). Other segments of the literature have analysed the role of education, natural resources, historical roots and demographic factors. Do cultural values and norms impact democratisation? There is no compelling evidence either for or against. Using a panel of countries from 1989 to 2014, I find a robust negative correlation between trust and democracy. This relationship is robust to controlling for socioeconomic, demographic and historical factors.

Chapter 3 investigates the impact of slavery on contemporary trust in Brazil. I combine contemporary trust data from Latino Barometro with historical slavery data from the 1872 Brazilian census. Overall, the results suggest that past slavery does not have a robust effect on current day generalized trust and trust in government. Furthermore, I do not find a negative effect of slavery on trust levels of Brazilians of mixed-race ancestry. Robustness check confirms the results are not driven by immigration, measurement of slave location and municipality age.

Chapter 4 investigates the short-term impact of the Portuguese Language Orthographic Reform on students in Brazil and Portugal. The Portuguese Language reform was an international agreement that unified orthography for the Portuguese Language. To measure the impact of the reform, we adopt a difference in difference framework using several waves of PISA (Program for International Student Assessment) data. The results suggest that the reform had a detrimental impact on Portuguese students' scores, which were more affected by the reform.

Contents

List of Tables

List of Figures

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Author's declaration

I hereby declare that this thesis is my own work, and the material contained in this thesis has not been submitted for a degree at any other university. The work contained in this thesis is original and all sources are acknowledged as references. Chapter 4 was written in co-authorship with Professor Giacomo DeLuca and Dr Paulo Santos Monteiro.

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Chapter 1

Introduction

Until recently, economists were reluctant to study the relationship between culture & norms, institutions and socio-economic outcomes.[1] This occurred due to difficulties in quantifying and defining values and norms. Nevertheless, classical economists such as Adam Smith, John Stuart Mill, Karl Marx, and Max Webber widely discussed culture in their work.

In recent decades, there has been a renewed interest in the relationship between culture, institutions and socio-economic outcomes. The development of new econometric techniques and data availability opened new avenues for researchers. A growing body of work has shown that culture and norms matter for socio-economic outcomes and institutions. This thesis consists of three essays that contribute to the economic literature investigating the relationship between culture, institutions and socio-economic outcomes.

The first two chapters are concerned with social capital, specifically, trust. In a seminal contribution, Arrow (1972) argued that trust was important for economic outcomes.

"Virtually every commercial transaction has within itself an element of trust, certainly any transaction conducted over a period of time. It can be plausibly argued that much of the economic backwardness in the world can be explained by the lack of mutual confidence." [2]

Since his work, the economic literature has investigated the impact of trust on socio-economic outcomes and institutions. Trust matters for economic development (Knack and Keefer, 1997; Algan and Cahuc, 2010), institutional quality (La Porta et al., 1997), international trade (Greif, 1989) and firm management(Bloom et al.,

[1] Other disciplines such as sociology and anthropology considered culture a major factor in political and socio-economic matters

[2] Arrow, K. (1972). "gifts and exchanges", philosophy and public affairs 1: 343-362

2008). Furthermore, higher trust is associated with lower corruption (Uslaner, 2002), and greater life satisfaction (Helliwell, 2003). Moreover, economists have strived to understand what factors determine trust (Alesina and Ferrara, 2000; Guiso et al., 2006; Bjørnskov, 2006; Tabellini, 2008a). Despite the expanding economic literature analysing norms and values, there remain many answered questions.

Chapter 2 reconsiders the relationship between trust and democratisation. Over the last decades, the world has become more democratic. Nonetheless, many countries are unable to develop democratic institutions. In recent years the world has observed China become more autocratic despite remarkable economic development. Within the European Union, Hungry and Poland have become more authoritarian countries despite economic integration with western European economies. Moreover, populist politicians have gained popularity around the world, attacking liberal democratic values and norms. Despite the extensive literature investigating the determinants of democratisation, the question of why some countries develop democratic institutions at certain periods remain unanswered. The driving forces behind democratisation are not fully understood. The literature has discussed the role of economic development, education, natural resources, historical roots and demographic factors.

Do cultural values and norms impact democratisation? There is no compelling evidence either for or against. Within the political science literature, Ronald Inglehart and Christian Welzel argued that human empowerment and values play an important role in the development of liberal democracies (Welzel and Inglehart, 1999; Inglehart and Welzel, 2005; Welzel and Inglehart, 2008).[3] Maseland (2013) and more recently Gorodnichenko and Roland (2021) argue that culture impacts institutional quality. Nevertheless, many political scientists and economists are sceptical of the impact of social capital on democratisation and institutions.[4]

Chapter 2 empirically reassesses the relationship between trust and democratisation. I combine country-level trust data from the World Value Survey (WVS) and European Value Survey (EVS) with a democracy score from the Varieties of Democracy (V-Dem) data set. Using a panel of countries from 1989 to 2014, I find a robust negative correlation between lower trust levels and better democratic scores. The data also suggests a positive and statistically significant correlation between income, education and democracy. Furthermore, I find that Muslim majority countries are less democratic. This relationship is robust to controlling for socioeconomic, demographic and historical factors.

Chapter 3 investigates the relationship between slavery and current-day trust in Brazilian Municipalities. As is the case in much of Latin America, Brazil is a low trust country. There is a growing literature in economics that studies how past

[3]This argument is discussed in more details in the book Inglehart and Welzel (2005).
[4]For example, see Teorell and Hadenius (2006).

events impact modern-day society. Brazil is a particularly well-suited country to study the impact of slavery on trust since it received more slaves than any other country in the Americas and was the last country in Western Hampshire to abolish slavery (Klein and Luna, 2009).

This chapter complements other attempts in the literature to uncover the impact of slavery on current day trust. Nunn and Wantchekon (2011) explores the impact of slavery on trust levels in African nations. The authors argue that the slave trade in Africa created an environment of permanent distrust that persists until today due to two reasons. First, captured individuals from other tribes were taken as slaves. This created an insecure environment outside of local communities. Second, as the slave trade grew over time and became more lucrative in the African continent, individuals within the same community and ethnic group, including family members, were sold as slaves.[5] However, the effects of slavery in receiving countries are very different because most of the effects described above are not operating. Charles (2017) investigates the impact of slavery on current day trust levels in US states. She argues that slavery was a traumatic experience for those brought to the Americas. Slavery created a low trust environment that persists until today. Nonetheless, the US experience with slavery was different from that observed in Brazil.

I combine contemporary trust data from Latino Barometer with historical slavery data from the 1872 Brazilian census. Contrary to what the literature concludes in other countries, the results suggest that slavery does not significantly impact current-day generalized trust and trust in government in Brazilian municipalities. Furthermore, I do not find a negative effect of slavery on trust levels of Brazilians of African and mixed ancestry. Robustness check confirms the results are not driven by immigration, measurement of slave location and municipality age.

Finally, chapter 4 investigates the impact of the Portuguese language orthographic reform on Brazilian and Portuguese student PISA scores. Chapter 4 communicates with three different strands of the literature- human capital, linguistic and economics of language literature. Language is an important part of our identity, together with ethnicity, nationality, religion and gender.

Marschak (1965) was the first to introduce a cost and benefits analysis of language in the economic literature. Following his work, many studies have researched the impact of language on socio-economic outcomes. Language affects international trade (Tinbergen, 1962), migration patterns (Chiswick and Miller, 1992), economic policies and the provision of public goods (Easterly and Levine, 1997), and multinational corporations and financial markets (Marschan-Piekkari et al., 1999; Ginsburgh and Weber, 2011).

[5]For a detailed historical summary of slavery in Africa see Lovejoy (2011)

In 2009 Portuguese speaking countries implemented a language reform to unify Portuguese grammar and spelling. There has been considerable debate in society about the benefits of unifying the Portuguese language, such as improving the international standing of the language, education, trade, commerce and tourism. What is the cost of the reform for students who had to learn and adapt to the new grammar and spelling rules?

We adopt a difference in difference framework using several waves of Pisa (Program for International Student Assessment) data. We develop our hypothesis by building on the linguistic literature. Language reforms have been controversial throughout history (Singh, 1975). Language is an integral part of group identity, and changes can lead to social and psychological reactions. We predict that the reform will have a greater impact on Portuguese students than Brazilian students for two reasons. First, Portugal experienced far more word changes, whereas Brazil observed fewer changes because their writing was much closer to the new rules. An estimate of 1.6 per cent of Portuguese words was affected in Portugal. This compares to an estimate of 0.8 per cent in Brazil. Second, the orthographic reform faced significant public opposition in Portugal. Critics argued that the reform was an interference in their culture since language is part of their cultural heritage. Many Portuguese people viewed the reform as a *Brazilianization* of their language. Our results suggest that the reform had a detrimental effect on Portuguese students PISA reading performance.

Chapter 2

Trust and Democracy

2.0.1 Introduction

Over the last decades, the world has become more democratic. Nevertheless, more than 40% of countries in the world have some form of autocratic regime.[1] What are the barriers to the development of more democratic institutions across the world? Despite extensive literature that discusses the determinants of democratisation, the driving forces behind democratisation are not fully understood.

Good quality democratic institutions is a desirable outcome on their own, independent of any economic factor. Individuals who live in a democratic country enjoy greater personal, economic and political freedom. Nonetheless, there are economic benefits to developing democratic institutions. Democratic countries experience higher economic growth and development (Boix and Stokes, 2003; Persson and Tabellini, 2009; Acemoglu et al., 2019).[2] Additionally, democracy is associated with increased well-being (Schyns, 1998; Veenhoven, 2000; Dorn et al., 2007) and better health outcomes (Besley and Kudamatsu, 2006).

Modernisation theory argues that economic growth and development is the driving force behind democratisation (Lipset, 1959). Nevertheless, recent events suggest that economic development alone cannot explain democratisation. For instance, China is becoming more autocratic in recent years despite remarkable economic development. Hungry and Poland have grown increasingly authoritarian despite economic integration with the European Union. Moreover, populist politicians have gained popularity in recent years around the world, attacking liberal democratic values and norms.

[1] According to the Pew Research centre, using 2017 polity IV data as a proxy for democracy.

[2] A large literature investigates the relationship between democracy and economic growth. A segment of the literature argues that democratic countries do not have higher growth rates. For more details, see the literature review section.

Could cultural values have an impact on democratisation? There is no consensus answer among academics to this question. The role of culture has been largely neglected in the economic democratisation literature.[3]

In the political science literature, Ronald Inglehart and Christian Welzel argued that human empowerment and values are vital for the development of liberal democracies (Welzel and Inglehart, 1999; Inglehart and Welzel, 2005; Welzel and Inglehart, 2008).[4] In their view, elite bargaining was central to the emergence of democratic institutions. Nonetheless, the survival and expansion of democratic institutions are dependent on social values and norms.

In this paper, I reconsider the link between trust and democracy. I combine country-level trust data from the World Value Survey (WVS) and European Value Survey (EVS) with a democracy score from the Varieties of Democracy (V-Dem) data set.[5] There is no perfect blueprint to study the relationship between trust and democracy. Nonetheless, the results obtained estimating different regressions are reassuringly consistent. Using a panel of countries from 1989 to 2014, I find a robust negative correlation between trust and democracy. The data suggests there is a positive and robust correlation between income, education and democracy. Moreover, there is a negative correlation between Muslim majority countries and democracy. This relationship is robust to controlling for socioeconomic, demographic and historical factors. I show that the results are not driven by the middle east - a region with autocratic governments and rich in natural resources, countries that experienced internal conflicts and former British colonies.[6]

Understanding the relationship between trust and democratisation is challenging. First, we have the problem of reverse causality. It is possible to argue that trust impacts democratisation and vice versa. Furthermore, trust and democracy are closely related, and it can be challenging to separate one from another empirically. One must be cautious in interpreting the results of this paper. Several factors impact a society path towards developing democratic institutions. Nevertheless, the data does not support the view that trust is necessarily associated with greater democratisation.

This paper relates to two strands of the literature. First, this paper is related to the broader democratisation literature that studies how socioeconomic, demographic, cultural and historical factors affect democratisation. Second, this paper relates to the small economic literature that investigates the relationship between culture and

[3] In the economic literature, terms such as culture, social capital and trust have been used interchangeably. See Alesina and Giuliano (2015) for a detailed literature review on the relationship between culture and institutions.

[4] This argument is discussed in details in the book Inglehart and Welzel (2005).

[5] The term V-Dem will be used as a short form for Varieties of Democracy

[6] A part of the democratisation literature argues that former British colonies are more democratic.

democracy. Maseland (2013) uses the rate of Toxoplasma infection as an instrument for cultural variation and finds that cultural values impacts institutional quality and economic outcome. Gorodnichenko and Roland (2021) develops a model where individualistic values contribute to the development of democratic institutions. The authors empirically test the model and find a robust effect of individualistic value on democratic institutions. Additionally, this paper may be of interest to the broad economic literature that investigates the correlation between different socioeconomic and political outcomes.[7]

This paper contributes to the large cross country literature that discusses the determinants of democratisation. More specifically, the relationship between trust and democratisation. I reassess the link between trust and democracy using a newer and broader measurement of democracy (V-Dem liberal democracy index). The V-Dem data provides a multidimensional measurement of democracy that goes beyond holding regular elections. The majority of the literature uses polity IV scores as a proxy for democratisation

The remainder of this paper proceeds as follows. Section 2 describes the literature review. Section 3 discusses possible channels through which trust impact democratization and vice versa. Moreover, I discuss some anecdotal evidence. Section 4 presents the identification strategy. Section 5 describes the data. Section 6 presents the results, and section 7 offers some concluding remarks.

2.1 Related Literature

2.1.1 Determinants of Democratisation

The question of why some societies develop democratic institutions has been at the heart of political economy for decades.[8] American sociologist Seymour Lipset was among the first scholars to study what factors lead to the development of democratic institutions. Lipset (1959) concluded that improvements in education and growth of the middle class were requisites for the development of democratic institutions. Since his work, a vast theoretical and empirical literature has developed discussing the determinants of democratisation.

A substantial part of the literature investigates the link between economic factors and democratisation. Nonetheless, the findings are inconclusive. Several cross country studies found no robust effect of economic development on democratisation (Hel-

[7] See for example Besley and Kudamatsu (2006) and Chetty et al. (2016)

[8] There is extensive literature that discusses democratisation. I do not have enough space to discuss it in detail in this paper.

liwell, 1994; Barro, 1996; Przeworski and Limongi, 1997). Gerring et al. (2005) reviewed the literature and concluded there was no strong evidence that economic development contributed to democratisation. Csordás and Ludwig (2011) concludes that income per capita income has no statistically significant effect on democracy if you control for neighbouring countries and aid. On the other hand, several recent studies have concluded that economic growth has an impact on democratisation (Rodrik and Wacziarg, 2005; Papaioannou and Siourounis, 2008; Acemoglu et al., 2019).

Another strand of the literature investigates the relationship between education and democracy. Several studies argue that education has a positive impact on the development of democratic institutions (Barro, 1999; Przeworski et al., 2000; Glaeser et al., 2004). However, Acemoglu et al. (2005) argues that the cross-country positive relationship between education and democracy does not exist if country fixed effects are included in the model.

Some papers explore how historical roots shaped democratic institutions. For instance, former British colonies were more likely to become democratic after independence (Weiner et al., 1987; Lipset et al., 1993; Bernhard et al., 2004; Olsson, 2009).[9] Muslim majority countries are less democratic (Huntington, 1991; Fish, 2002; Maseland and Van Hoorn, 2011).

Moreover, researchers have also studied the impact of demographic factors on democratisation. Djankov et al. (2003) argues that large urban areas have a lot of trade and innovation. Citizens living in large cities prefer a democratic regime. Wantchékon et al. (2013) finds that African countries that experienced urban insurgency movements at the time of colonial independence are more likely to have democratic regimes today than those that experienced rural insurgencies.

The literature has also investigated the impact of natural resources on democratisation. Evidence suggests that countries in which oil exploration is a significant source of revenue are less democratic (Barro, 1999; Ross, 2001). To summarise, an extensive literature on democratisation shows that many factors influence a country's path towards establishing democratic institutions.

2.1.2 Social Capital and Democratisation

This paper is of primary interest to the literature that investigates the relationship between culture and democracy. Verba and Almond (1963) were among the first to argue that culture was important for democratisation. The authors studied five

[9]Some studies do not find that former British colonies were more democratic (Barro, 1999; Przeworski et al., 2000; Woodberry, 2018)

countries- Italy, Germany, the United States, the United Kingdom and Mexico. Within the political science literature, Putnam (1993) concluded that differences in social capital could partially explain differences in the quality of local government in Italy. Anecdotal evidence has its limitations. First, it is unclear whether what occurs in one country is true for other countries. Second, anecdotal evidence does not consider the counterfactual.

Recently, there has been a resurgence of interest in the economics literature regarding the relationship between culture and institutions. Studies have concluded that institutions do impact culture and social capital. Alesina and Fuchs-Schündeln (2005) investigates how Germans' preferences for redistributive policies differed between west and east Germany. Rainer and Siedler (2009) finds that institutional trust increased in former East Germany after reunification; however, the same did not occur for social capital. Ljunge (2014) concludes that democratic institutions have a positive impact on trust. Comparing second-generation immigrants in 30 different European countries, the authors argue that those individuals whose fathers were born in a more democratic country have higher trust. Guiso et al. (2016) finds that central and northern Italian cities that had self-governance during the middle ages have higher social capital today.

Few papers investigated how culture impacts institutions and democratisation. This is challenging due to reverse causality. To overcome this issue, papers adopt an instrumental variable strategy. However, one cannot rule out the possibility that the instrument violates the exclusion restriction or an omitted variable bias drives the results. Maseland (2013) deals with the endogeneity of institutions by using prevalence rates of Toxoplasma gondii as an instrument for cultural variation. The author concludes that culture characterised by low levels of trust, high acceptance of power distance, and collectivism tend to have lower-quality institutions and economic development. Gorodnichenko and Roland (2021) develops a model where individualistic cultural values contribute to the development of democratic institutions. Furthermore, the authors test the model empirically and find a robust effect of individualism on polity scores. The same is not valid for other cultural dimensions-social capital, power distance, uncertainty avoidance, masculinity, and long-term orientation.

In contrast to the two papers cited above, the approach taken by this paper is not able to distinguish a causal effect of trust on democratisation. Even if a correlation can be established, it is not possible to interpret the results as causal due to reverse causality. Moreover, an omitted variable may be driving the results. Instead, I aim to contribute to the literature identifying the association between trust and democratisation.

2.2 Conceptual Framework

This section serves two purposes. First, it discusses possible channels through which trust may impact democratisation and vice versa. Second, I discuss anecdotal evidence regarding the relationship between trust and democratisation.

2.2.1 Linking Social Capital and Democracy

The literature discusses different Channels through which trust affects democratisation. Welzel and Inglehart (2008) argues that higher trust facilitates greater participation of individuals in civil society. The voluntary association of citizens create extended social networks that contribute to democratisation. First, there are learning effects. Voluntary interaction of individuals leads to new knowledge, skills and changes to attitudes (Hooghe, 1999; Putnam, 2015). Second, there may be what Warren (2001) called public sphere effects. Individuals participating in a voluntary organisation can discuss new ideas in the community. Third, there can be institutional effects. Groups that participate in protests can engage with the government and influence policy decisions. Moreover, civil society organisations have greater bargaining power (Foley and Edwards, 1996).

Another channel through which trust may impact democratisation is through empathy. Individuals in a high trust society have greater empathy towards others. As a result, if government actions are perceived as unfair to a specific group in society, citizens may have a stronger incentive to organise and pressure the authorities. To sum up, the argument advanced by the literature is that trust is important for collective action.

Moreover, democracy influences trust. Democratic institutions provide civil and political rights that enable greater civic engagement in society. For instance, citizens who live in a democratic country have confidence that the authorities will not persecute them due to their political views or activities. There can be a virtuous cycle in which increased trust leads to democratisation, and democratisation leads to increased societal trust.

On the other hand, it is plausible that a negative relationship may exist between trust and democratisation. There are several mechanisms through which greater social capital may negatively impact democratisation. (1) As previously stated, trust facilitates collective action. However, it is not always a force for good (Portes, 1998).For example, higher trust may empower undemocratic groups that support the status quo in an autocratic country. (2) Higher trust may crowd out improvements to a country's institutions. Bohnet et al. (2001) develops a model in which

there is a substitution effect between a low-quality legal system and trustworthiness. If a person knows that contract enforcement is not adequate, they will only enter a contract if they trust the business. The authors test their model in a laboratory and find support for their crowding-out hypothesis. For instance, if the judiciary is corrupt and inefficient, trust might enable individuals and businesses in a given country to enforce contracts informally. Thus, it can reduce the incentive for individuals and businesses to pressure the government for changes that create a more efficient and democratic judiciary. (3) In an autocracy, it is common for the state to have some form of control over the media, universities and other institutions that shape public opinion. Autocratic governments can put pressure on institutions that shape public opinion to support the government. Citizens may trust those institutions and become more supportive of an autocratic government.

An autocratic regime may erode trust. Individuals may be fearful of expressing a critical opinion against the government in public. For instance, someone close to a group of friends may denounce them to the authorities for their political views.

In summary, there are many channels through which trust and democratisation interact with each other. Thus, the extent to which generalised trust affects democratisation depends on which channel prevails. Moreover, there are examples of democratic countries with low trust and autocratic countries with high trust. In the next section, I briefly discuss three cases of anecdotal evidence: Eastern Europe, China and Latin America.

2.2.2 Anecdotal Evidence

Eastern European Countries

An extensive literature discusses the democratisation of Eastern European countries following the collapse of the Soviet Union and the end of the cold war. A segment of the literature argues that social capital contributed to the democratisation of the region (Arato, 2000; Bernhard, 1993; Badescu, 2004).

Badescu (2004) argues that social capital and trust enabled Poland to develop a strong civil society that created pressure for a move towards democratisation. An example is the Workers' Defense Committee (KOR). Bernhard (1993) argues that the Workers' Defense Committee (KOR) played an important role in the country's democratisation. KOR was established after the workers' strikes of June 1976. Polish workers protested against the rise of commodities, especially food prices, by

Piotr Jaroszewicz government.[10] Bernhard argues that KOR was able to maintain itself outside the structure of the Polish government. Furthermore, KOR created its own press that functioned outside the control of the Polish state. KOR also influenced the creation of other independent organisations. The rapid growth of civil organisations meant that the Polish government could not dismantle them.

Nonetheless, a strong civic society was not a reality across all Eastern European countries. Civil society was very limited in Bulgaria, Romania and Albania (Nelson, 1996). For instance, in Romania, there were few civil society organisations. The ones that existed were sports clubs or disabilities charities. Their impact on public policy was minimal.

China

China is the world's largest autocratic state, with a population of over 1.4 billion people. Despite being ruled by the Chinese Communist Party since 1949, China enjoys high levels of trust. The country has experienced rapid changes in recent years due to economic growth and development that lifted millions out of poverty. Nevertheless, from a democratic standpoint, high social capital did not significantly change the country's institutions.

One possible explanation for why high trust levels did not lead to greater democratisation is that Chinese citizens have high trust in their political institutions (Li, 2004; Wang, 2005). Chinese people level of confidence in their government is greater than many western democracies. Wang (2005) argues that economic growth strengthens trust in government. Moreover, Li (2004) finds that in rural China, people have more trust in higher levels of government compared to lower levels of government.

China is an example where high trust may contribute to maintaining the Chinese Communist Party in power. Moreover, despite Chinese authorities crackdown on opponents of the government, trust levels remain high.

Latin American Countries

Over the last 40 years, the majority of Latin American countries have seen a consolidation of democracy. There are exceptions, such as Venezuela under the late president Hugo Chavez and his successor Nicólas Maduro. Nonetheless, the current democratic situation is a world apart from the reality of the 20th century. After the Cuban Revolution (1959), military forces played an important role in

[10]The Polish government imposed price controls at the time. Due to the country economic situation, prices had to rise. For a detailed description of the 1976 strike, read Bernhard (1987)

running many countries in the region.[11] This was the case in Ecuador (1964 - 1990), El Salvador (1948- 1984), Guatemala (1963–1985), Brazil (1964–1985), Bolivia (1964–1982), Argentina (1966–1983); Peru (1968–1980), Panama (1968–1989), Honduras (1963–1982), Chile (1973–1990) and Uruguay (1973–1984). The situation changed towards the end of the Cold War during the 1980s and early 1990 when civilian rule replaced military dictatorship.

Despite the transition to democratic forms of government, public opinion polls show again and again that trust remains a scarce commodity in the region. (Jamison, 2011). In a recent Latino Barometro poll, 63 percent of Brazilians do not trust people in their community.[12] The situation is not different in other democratic countries in the region. For instance, in Peru, 53 percent of the population do not trust others in their communities. Compare this to the United States (20 percent) or Canada (11 percent). Even in higher trust countries in the region, trust is low compared to other regions. In Uruguay, 24 percent do not trust people in their community. That is more than twice what is observed in Canada. In contrast to what a segment of the democratisation literature argued, low trust did not impede the region to improve its democratic institutions. Moreover, democracy did not contribute to higher trust levels.

2.3 Identification Strategy

To investigate the relationship between trust and democracy, I estimate the following OLS equation:

$$Democ_{ct} = \beta trust_{ct} + \gamma X_{ct} + \upsilon F_c + \gamma M_c + \delta U_{ct} + \kappa H_c + \nu Z_{ct} + \iota O_c + \alpha_t + E_{ct} \quad (2.1)$$

where *Democ* is the democratic score of country c at time t. Trust is the aggregation of individual responses to the generalized trust question on the WVS/EVS Survey of country c at time t. β is my coefficient of interest. X denotes economic (GDP p/ capita) and education (years of schooling) of country (c) at time (t). F denotes a series of time-invariant ethnolinguistic fractionalization. M is a dummy variable that takes the value of 1 for a Muslim majority country. U denotes the percentage of a country's urban population in a given year. H is a time-invariant dummy that indicates the legal origins of a country. Z denotes number of internal conflict in country c at time t. O is a dummy variable for Oil producing countries. α_t denotes

[11] For a detailed account of this period read Loveman (2011)
[12] Data: IDB-LAPOP (2016-2017)

WVS/ EVS year fixed effects. E is the error term clustered at the country level.

2.4 Data

2.4.1 Democracy

Democracy data is from the v-dem project. The dataset provides a multidimensional measurement of democracy. I use the yearly liberal democracy index, which considers civil liberties, the rule of law, independent judiciary, and effective checks and balances in the government. Countries are given a score that ranges from 0 to 1. A higher score means better quality democracy.

2.4.2 Trust

Trust data comes from combining 5 waves of the World Value Survey (WVS) and 3 waves of the European Value Study (EVS).[13] Both surveys ask standardized questionnaires to measure economic, political and social attitudes. Each survey is conducted in the local language. Combing both data sets, I have a total of 101 countries. The data set covers the period from 1989 - 2014.

I use the response to the following question: "Generally speaking, would you say most people can be trusted"? This gives a measurement of generalized trust, and not trust among group members or the same ethnic group.[14] Participants are given three options to answer the question: (1) Most people can be trusted, (2) Cannot be too careful and (3) do not know.[15] There is the option of not answering the question. I exclude those who answered do not know and those who did not answer the question from my sample. I take an average of overall trust in each country at a given year. If a country has two entries during a given wave because it was part of the WVS or EVS, I drop one year from the sample. No country is represented twice in any given wave of the surveys.

[13] I do not include the first WVS/ EVS wave due to the small number of countries that participated in the research programme. Due to data constraints, I drop data from three autonomous regions Northern Ireland (UK), Puerto Rico (US territory), Hong Kong (Special administrative region- China) and two countries- Andorra (microstate) and Taiwan (sovereignty disputed). For the list of countries, see the appendix.

[14] for a detailed discussion of generalized vs limited morality trust see Tabellini (2010)

[15] Trust data is standardized so that higher value means higher trust

2.4.3 Socioeconomic, Demographic and Historical Data

I follow the cross country democratisation literature and control for socioeconomic, demographic and historical factors. Economic, education and demographic data come from the World Bank. To control for income, I include the log of GDP per capita. As a control for education, I have yearly data on the number of years that a child who starts school is expected to stay in formal education. There is the possibility that urban populations are associated with greater support for democracy. I include a control for the percentage of people living in urban areas.

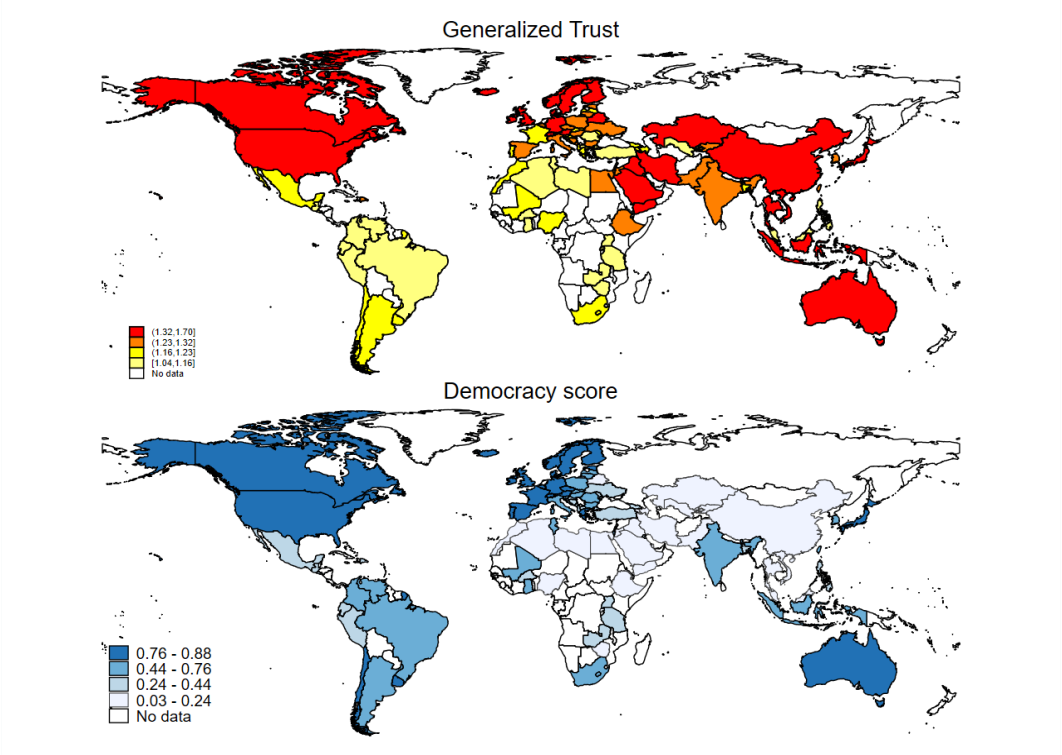
Language, religion and ethnic fractionalization data is from Alesina et al. (2003). Religious and legal origin data is from La Porta et al. (1999). I create a dummy variable for countries that have a majority Muslim population. Since religion composition changes slowly over time, no country becomes Muslim majority during the period of my panel data (1989-2014). Moreover, I create a dummy for countries that use English common law.

Conflict Data is from the Uppsala Conflict Data Program (UCDP) at the Department of Peace and Conflict Research at Uppsala University. Internal armed conflict occurs between the government of a state and any internal opposition group that fights for political or ideological reasons. As expected, the majority of armed internal conflicts occurred in developing economies. Nonetheless, there are two exceptions. Israel, due to the conflict between the Israeli state and the Palestine territories. The United Kingdom also experienced internal armed conflict during the 1990's, in Northern Ireland.[16]

Last, I have data on oil rent as a percentage of GDP. Oil rents are calculated as the difference between the value of crude oil production at world prices and total costs of production. I create a dummy variable for countries that have oil rents as a percentage of GDP.

[16]The conflict ended with the signing of the Good Friday agreement in 1998.

Figure 2.1: Generalized Trust vs. Trust



2.4.4 Descriptive Statistics

There are 101 countries in the data. The majority of countries are developing economies. The period analyzed in this paper (1989 - 2014) was a time of profound change in many parts of the world. The fall of the Soviet Union and the end of the Cold War ushered changes across the globe. However, as shown in figure 2, the average liberal democracy score in each wave did not improve during this period. This occurs since the V-Dem liberal democracy score is a multidimensional measurement of democracy. Therefore, there are some small variations in a country score in different years. For instance, Sweden has the highest recorded democratic score in the data- .887 in 1990. In 1996 the country score declined to .869. Saudi Arabia has the lowest democratic score of any country in the data- .031 in 2003. This reflects the country authoritarian regime and restrictions on personal freedom. Table 1 presents the average statistics for the data.

Overall, Scandinavian countries - Denmark, Sweden, Norway, Finland and Iceland- have among the highest trust scores in the world. Denmark has the highest trust score (1.76) in 2008. China is another country with a high level of trust. The lowest trust score is from developing economies: Philippines (1.028) in 2012 and Brazil (1.028) in 1997. Figure 3 shows the correlation between trust and liberal democracy score (V-Dem) during the different waves of the WVS/ EVS.

Figure 2.2: Liberal Democracy Score Evolution

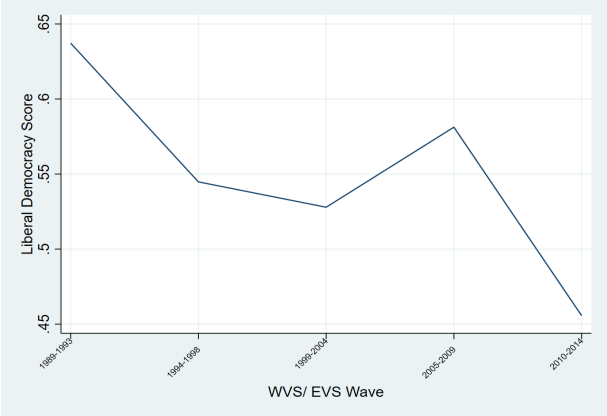


Figure 2.3: Trust and Liberal Democracy Score

Table 2.1: Descriptive Statistics

	Obs.	Mean	SD	Min.	Max.
Liberal democracy	101	0.490	0.265	0.031	0.880
Polity	98	4.923	5.795	-10	10
Trust	101	1.260	0.145	1.035	1.682
Log GDP p/ capita	100	8.573	1.439	5.478	11.249
Education (Years)	100	12.892	2.665	5.400	19.800
Ethnic fractionalization	98	0.387	0.242	0.002	0.930
Language fractionalization	97	0.339	0.272	0.002	0.923
Religion fractionalization	99	0.415	0.240	0.002	0.860
Islam dummy	101	0.198	0.400	0	1
Urban population	101	63.111	20.689	15	100
Common law dummy	101	0.228	0.421	0	1
Internal conflict data	101	.3211221	.8521147	0	5
Oil dummy	101	.2836634	.4464924	0	1

Notes: This table shows the descriptive statistics for the main variables used in the paper. For a complete description of the variables and their corresponding sources, see the appendix. All variables are consistent with their original source unless otherwise noted.

2.5 Results

Table 2 reports the relationship between trust and democratisation. In column (1), I control for year fixed effects. The coefficient of interest is positive and statistically significant, suggesting a positive correlation between generalised trust and democratisation. A one-unit change in trust increases democratisation by 0.383 points. This represents a strong association, given that the democracy data is from 0 to 1. However, this is an overestimation since other variables that influence democratisation are not considered. Moving to column (2), I control for income (log GDP per capita), which behaves as expected. Richer countries have better democratic institutions. However, my coefficient of interest is negative and not statistically significant. In column (3), I control for education- expected years of a child in formal education. In conformity with the literature, education has a positive and robust correlation with democratisation. The coefficient is small (0.033). One possible explanation is that I used years in education as a proxy for human capital. Hanushek and Woessmann (2008) argue that years in school is not a good proxy for education. School quality is a better measurement of human capital. Due to data limitations, most cross country studies rely on years in education. Therefore, the regression results may represent an underestimation of the relationship between education and democracy.

In columns (4) and (5), respectively, I include controls for ethnic fractionalisation and religion (dummy for Muslim majority countries). Ethnic fictionalisation has a negative and statistically significant effect on democratisation. In contrast, language fractionalisation has a positive correlation with democratisation. Nonetheless, this is not the case for all the columns. However, I find a robust negative correlation between Muslim majority countries and democratisation. This has been documented in the literature (Huntington, 1991; Maseland and Van Hoorn, 2011).

In column (6), I control for the urban population. A segment of the literature argues that larger urban areas tend to be more liberal and support greater democratisation (Djankov et al., 2003). Nonetheless, the results suggest that urban population do not have a statistically significant effect on democratisation. In column (7), I account for the legal origins of a country. I include a dummy variable if the country legal system is based on English common law. According to the literature, English common law may be more protective of investors than civil law, which is based on Roman or French law (La Porta et al., 1997, 1999). Nonetheless, the results do not show any robust correlation.

In the last two columns (8) & (9), I respectively control for internal conflict and oil-producing countries. Countries ravaged by conflict can impose temporary restrictions on the functioning of democratic institutions and broader civil liberties.

However, I do not find any statistically significant correlation between internal conflict and democratisation. Last, I control for oil-producing countries.

To sum up, the coefficient of interest remains positive only in column (1). Once I add the standard controls used in the literature, the results change. The coefficient of interest remains negative and significant, suggesting an association between lower trust and greater democratisation. The control variables are in line with the broad democratisation literature that argues that income and education are correlated with democratisation. Moreover, the literature finds that Muslim majority countries are less democratic.

Table 2.2: Regression Results

Dep: Var: Democracy	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust	0.383**	-0.141	-0.191	-0.284**	-0.216	-0.226*	-0.226*	-0.226*	-0.227*
	(0.185)	(0.129)	(0.127)	(0.123)	(0.131)	(0.132)	(0.131)	(0.131)	(0.132)
Log GDP p/ capita		0.143***	0.093***	0.096***	0.096***	0.106***	0.102***	0.105***	0.106***
		(0.015)	(0.019)	(0.020)	(0.019)	(0.020)	(0.020)	(0.020)	(0.020)
Education			0.033***	0.033***	0.023**	0.027**	0.027***	0.028***	0.027***
			(0.009)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Ethnic fractionalization				-0.205**	-0.169*	-0.142	-0.150	-0.128	-0.137
				(0.096)	(0.090)	(0.096)	(0.098)	(0.095)	(0.096)
Language fractionalization				0.185*	0.160*	0.137	0.131	0.100	0.113
				(0.106)	(0.096)	(0.100)	(0.094)	(0.092)	(0.096)
Religion fractionalization				0.038	-0.063	-0.070	-0.084	-0.055	-0.064
				(0.073)	(0.074)	(0.076)	(0.088)	(0.081)	(0.084)
Islam dummy					-0.192***	-0.187***	-0.188***	-0.184***	-0.189***
					(0.050)	(0.050)	(0.050)	(0.048)	(0.051)
Urban population						-0.001	-0.001	-0.001	-0.001
						(0.001)	(0.001)	(0.001)	(0.001)
Common law dummy							0.024	0.012	0.014
							(0.049)	(0.046)	(0.046)
Internal armed conflict								0.019	0.017
								(0.022)	(0.022)
Oil dummy									-0.020
									(0.036)
Constant	0.116	-0.438***	-0.349***	-0.253*	-0.177	-0.195	-0.181	-0.220	-0.212
	(0.240)	(0.131)	(0.124)	(0.149)	(0.143)	(0.144)	(0.147)	(0.144)	(0.143)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	283	282	280	275	275	275	275	275	275
Clusters	101	100	100	96	96	96	96	96	96

This table presents estimates of the relationship between trust and democracy.
In all specifications I control for year fixed effects. Robust standard errors clustered at the country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

A substantial worry is that country-specific characteristics described in the literature to impact democratisation drive the results. I next investigate these threats. A first concern is that Middle East countries are responsible for the negative correlation between trust and democratisation. Although I include a dummy variable for oil, not all oil-producing countries have authoritarian governments. The idea here is that many autocratic countries in the region rely to a great extent on oil production. There are several ways through which oil revenues can harm democratisation (Ross, 2001). Governments can tax less their citizens. Oil money may lead to greater patronage in society, which results in more resistance to democratic changes. Furthermore, oil provides the government with a constant source of revenue. This means that it is easier for governments to oppose outside groups.

Table 3 presents the results excluding Middle East countries.[17] The results confirm the pattern of table 2. There is a positive correlation between trust and democratisation. However, the results do not hold once I control for socio-economic factors. Lower trust is correlated with better democratic institutions. There is no significant change in the magnitude of the coefficient of interest. As expected, there is a robust and positive correlation between income and education with democratisation. Moreover, the results suggest that the negative relationship between Muslim countries and democratisation is not driven by the Middle East, where Islam is the dominant religion.

A second concern is that countries involved in international armed conflict can have lower quality democratic institutions. Although I control for internal conflict, there is the possibility that countries fighting wars abroad may also restrict democratic institutions. Moreover, conflict can harm trust levels. To check this, I rerun the regression model above drooping countries involved in international conflict during the period.

Table 4 reports the results excluding countries involved in international conflict.[18] The coefficient of interest remains negative and statistically significant. In addition, income and education remain positively correlated with greater democratisation. Islamic countries continue to be associated with lower democratisation. These results suggest that international conflict is not driving the negative association between trust and democratisation.

A third potential concern is that former British colonies are responsible for the negative correlation between trust and democratisation. A segment of the democratisation literature argues that former British colonies are more democratic. The argument is that most colonies would inherit their political institutions from their former

[17] The following Middle East countries were excluded: Algeria, Iran, Iraq, Israel, Jordan, Kuwait, Lebanon, Libya, Malta, Morocco, Qatar, Saudi Arabia, Tunisia, Egypt and Yemen.

[18]

colonisers. Some academics argue that the British government took into consideration local circumstances during their rule and were more willing to arrange an organised power transition. Other studies have looked into the impact of protestant missions associated with British colonial rule Porter (2003).

Table 5 presents the result excluding former British colonies.[19] The negative relationship between trust and democratisation is stronger. In addition, income and education continue to have a positive effect on democratisation. As expected, Muslim majority countries are less democratic. Overall, the results suggest that trust is negatively correlated with greater democratisation in the period analysed in this paper. How do these findings fit into the democratisation literature? Gorodnichenko and Roland (2021) finds that trust and other cultural dimensions (power distance, uncertainty avoidance, masculinity, long-term orientation) are not associated with higher democratisation using polity IV as a proxy for democracy. The authors argue that individualistic values have a robust effect on polity IV scores. However, Maseland (2013) creates a cultural score that includes trustworthiness and finds that culture has a positive effect on institutions.

[19]The former British colonies were excluded: Australia, Bangladesh, Canada, Cyprus, Ghana, India, Iraq, Ireland, Jordan, Kuwait, Malaysia, New Zealand, Nigeria, Malta, Pakistan, Qatar, Singapore, United States, South Africa, Zimbabwe, Trinidad and Tobago, Uganda, Egypt, Tanzania, Yemen and Zambia.

Table 2.3: OLS- Trust and Democracy without Middle East

Dep: Var: Democracy	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust	0.436**	-0.124	-0.167	-0.229*	-0.220	-0.224*	-0.225*	-0.228*	-0.228*
	(0.193)	(0.144)	(0.144)	(0.129)	(0.133)	(0.132)	(0.130)	(0.130)	(0.132)
Log GDP p/ capita		0.140***	0.105***	0.105***	0.106***	0.109***	0.105***	0.110***	0.110***
		(0.016)	(0.019)	(0.020)	(0.020)	(0.021)	(0.021)	(0.020)	(0.020)
Education			0.024**	0.027***	0.022**	0.024**	0.025**	0.026**	0.025**
			(0.009)	(0.010)	(0.010)	(0.011)	(0.011)	(0.011)	(0.011)
Ethnic fractionalization				-0.138	-0.144	-0.134	-0.146	-0.108	-0.116
				(0.102)	(0.105)	(0.112)	(0.115)	(0.109)	(0.109)
Language fractionalization				0.161	0.164	0.155	0.148	0.102	0.115
				(0.110)	(0.111)	(0.115)	(0.106)	(0.101)	(0.106)
Religion fractionalization				-0.057	-0.086	-0.089	-0.109	-0.065	-0.074
				(0.080)	(0.083)	(0.085)	(0.100)	(0.090)	(0.095)
Islam dummy					-0.112*	-0.113*	-0.117*	-0.108*	-0.113*
					(0.065)	(0.064)	(0.064)	(0.060)	(0.063)
Urban population						-0.001	-0.000	-0.000	-0.000
						(0.002)	(0.002)	(0.002)	(0.002)
Common law dummy							0.032	0.015	0.017
							(0.052)	(0.047)	(0.047)
Internal armed conflict								0.030	0.028
								(0.024)	(0.024)
Oil dummy									-0.020
									(0.037)
Constant	0.044	-0.440***	-0.368***	-0.293*	-0.242	-0.246	-0.224	-0.292*	-0.288*
	(0.251)	(0.127)	(0.122)	(0.149)	(0.152)	(0.154)	(0.159)	(0.153)	(0.151)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	256	255	253	249	249	249	249	249	249
Clusters	86	85	85	82	82	82	82	82	82

This table presents estimates of the relationship between trust and democracy excluding Middle East countries.
In all specifications, I control for year fixed effects. Robust standard errors clustered at the country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.4: OLS Trust and Democracy -without International Conflict

Dep: Var: Democracy	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust	0.161	-0.210	-0.258	-0.357**	-0.281*	-0.300*	-0.297*	-0.296*	-0.292*
	(0.227)	(0.157)	(0.158)	(0.152)	(0.160)	(0.160)	(0.159)	(0.159)	(0.158)
Log GDP p/ capita		0.128***	0.084***	0.085***	0.090***	0.097***	0.091***	0.093***	0.092***
		(0.019)	(0.023)	(0.022)	(0.022)	(0.025)	(0.025)	(0.024)	(0.024)
Education			0.030***	0.030***	0.019	0.022*	0.023**	0.023**	0.024**
			(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)
Ethnic fractionalization				-0.232**	-0.197*	-0.181	-0.189*	-0.179	-0.169
				(0.106)	(0.105)	(0.113)	(0.113)	(0.109)	(0.115)
Language fractionalization				0.160	0.157	0.139	0.126	0.111	0.100
				(0.121)	(0.112)	(0.117)	(0.109)	(0.110)	(0.115)
Religion fractionalization				0.047	-0.060	-0.068	-0.084	-0.070	-0.066
				(0.089)	(0.093)	(0.096)	(0.108)	(0.103)	(0.104)
Islam dummy					-0.198***	-0.196***	-0.197***	-0.193***	-0.188***
					(0.059)	(0.059)	(0.058)	(0.054)	(0.057)
Urban population						-0.001	-0.001	-0.001	-0.001
						(0.002)	(0.002)	(0.002)	(0.002)
Common law dummy							0.035	0.030	0.028
							(0.056)	(0.052)	(0.052)
Internal armed conflict								0.008	0.010
								(0.028)	(0.028)
Oil dummy									0.020
									(0.045)
Constant	0.418	-0.215	-0.143	-0.013	0.022	0.019	0.038	0.022	0.016
	(0.297)	(0.167)	(0.158)	(0.180)	(0.169)	(0.169)	(0.171)	(0.162)	(0.161)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	192	191	189	186	186	186	186	186	186
Clusters	95	94	94	91	91	91	91	91	91

This table presents estimates of the relationship between trust and democracy excluding countries involved in int. conflict. In all specifications I control for year fixed effects. Robust standard errors clustered at the country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

Table 2.5: OLS- Trust and Democracy without Former British Colonies

Dep: Var: Democracy	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Trust	0.290	-0.245*	-0.287**	-0.335***	-0.332***	-0.332***	-0.323***	-0.355***	-0.355***
	(0.218)	(0.123)	(0.115)	(0.123)	(0.120)	(0.119)	(0.115)	(0.114)	(0.115)
Log GDP p/ capita		0.162***	0.109***	0.111***	0.111***	0.111***	0.117***	0.115***	0.115***
		(0.012)	(0.018)	(0.019)	(0.023)	(0.023)	(0.024)	(0.023)	(0.024)
Education			0.0412***	0.039***	0.031***	0.028**	0.028**	0.023**	0.024**
			(0.011)	(0.011)	(0.012)	(0.011)	(0.011)	(0.011)	(0.011)
Ethnic fractionalization				-0.085	-0.117	-0.119	-0.105	-0.143	-0.143
				(-0.0848)	(-0.117)	(-0.119)	(-0.105)	(-0.143)	(-0.143)
Language fractionalization				0.069	0.115	0.117	0.113	0.169	0.169
				(0.084)	(0.091)	(0.098)	(0.097)	(0.108)	(0.109)
Religion fractionalization				0.044	-0.053	-0.053	-0.039	-0.073	-0.073
				(0.079)	(0.083)	(0.084)	(0.080)	(0.084)	(0.084)
Islam					-0.171***	-0.171***	-0.163***	-0.166***	-0.166***
					(0.058)	(0.058)	(0.054)	(0.054)	(0.055)
Urban population						-0.001	-0.001	-0.001	-0.001
						(0.002)	(0.002)	(0.002)	(0.002)
Common law dummy							-0.162**	-0.120	-0.120
							(0.067)	(0.078)	(0.079)
Internal armed conflict								-0.0392*	-0.0392*
								(0.023)	(0.023)
Oil dummy									-0.000
									(0.039)
Constant	0.270	-0.469***	-0.453***	-0.398***	-0.257	-0.256	0.308 **	-0.221	-0.221
	(0.276)	(0.130)	(0.119)	(0.163)	(0.155)	(0.157)	(0.152)	(0.159)	(0.162)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	218	217	215	211	211	211	211	211	211
Clusters	95	94	94	91	91	91	91	91	91

This table presents estimates of the relationship between trust and democracy, excluding former British Colonies.
In all specifications I control for year fixed effects. Robust standard errors clustered at the country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

2.5.1 Alternative Measurement of Democratisation

The results presented so far suggest a negative correlation between trust and democratisation- measured by liberal democracy index. One concern is that the results are driven by the measurement of democratisation. To check this, I rerun the regression using an alternative measurement of democratisation- constraint on executive power.[20]

Table 6 presents the results. In column (1), I find a positive relationship between trust and constraint on the executive power. In columns (2) - (6) the coefficient of interest remains negative and statistically significant. There is a negative and robust association between trust and democratisation, despite the fact that I am using a more restricted measurement of democratisation.

There is a debate within the political science literature about two different types of democracy- a narrow view and a broad concept of democracy. The first definition understands democracy to be the holding of competitive and free democracy. In contrast, the second definition argues that democracy goes beyond elections and refers to active public participation in public life. Using constraint on the executive as a proxy of democratisation, the results do not change.

[20] In the data set, constraint on the executive scores goes from 1 to 7.

Table 2.6: Robustness- Trust and Democracy

Dep VAR:	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Constraint on the executive									
Trust	1.025	-1.565*	-1.946**	-2.471***	-2.051**	-2.195**	-2.197**	-2.173**	-2.186**
	(1.031)	(0.879)	(0.886)	(0.761)	(0.857)	(0.885)	(0.879)	(0.869)	(0.876)
Income		0.688***	0.368**	0.372**	0.387**	0.509***	0.490***	0.541***	0.549***
		(0.126)	(0.179)	(0.179)	(0.178)	(0.189)	(0.183)	(0.181)	(0.181)
Education			0.220***	0.237***	0.159*	0.211**	0.214***	0.226***	0.219***
			(0.080)	(0.079)	(0.083)	(0.081)	(0.078)	(0.076)	(0.075)
Ethnic frac				-1.212	-0.980	-0.577	-0.628	-0.188	-0.273
				(0.780)	(0.687)	(0.754)	(0.782)	(0.758)	(0.775)
Language frac				1.419*	1.285*	0.962	0.934	0.382	0.497
				(0.799)	(0.670)	(0.701)	(0.668)	(0.652)	(0.699)
Religion frac				-0.149	-0.921*	-0.988*	-1.073*	-0.613	-0.685
				(0.561)	(0.519)	(0.512)	(0.590)	(0.472)	(0.479)
Islam dummy					-1.496***	-1.439***	-1.448***	-1.362***	-1.417***
					(0.542)	(0.534)	(0.535)	(0.512)	(0.517)
Urban population						-0.019	-0.018	-0.020	-0.020
						(0.012)	(0.012)	(0.013)	(0.013)
Common law dummy							0.135	-0.058	-0.037
							(0.371)	(0.344)	(0.336)
Internal conflict								0.305*	0.285*
								(0.156)	(0.158)
Oil dummy									-0.203
									(0.259)
Constant	4.885***	2.318**	2.922***	3.436***	4.045***	3.784***	3.873***	3.187***	3.252***
	(1.372)	(0.981)	(0.963)	(1.144)	(1.133)	(1.127)	(1.184)	(1.170)	(1.167)
Observations	268	267	266	262	262	262	262	262	262
R-squared	0.040	0.303	0.339	0.351	0.411	0.425	0.426	0.444	0.446

This table presents estimates of the relationship between trust and democracy- constraint on the executive.
In all specifications I control for year fixed effects. Robust standard errors clustered at the country level.
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$.

2.6 Conclusions

There is extensive literature that explores the determinants of democratisation. However, the reason why some countries are unable to develop democratic institutions remains unclear. The majority of the literature examines how socioeconomic and historical factors influence democratisation. Nonetheless, little is known about the impact of cultural values on democratisation.

This paper reassesses the link between trust and democratisation by analysing trust data from the World Value Survey/ European Value Survey and V-dem (liberal democracy score). For a panel of countries from 1989 to 2014, I find a negative correlation between trust and liberal democracy. The results are robust for excluding autocratic and oil-dependent Middle East countries, countries involved in international conflict and former British colonies. Moreover, as expected, I find a positive association between income, education and democracy. The data suggests that Islam is negatively correlated with democratisation.

All in all, the period analysed in this paper do not support the theory proposed by Welzel and Inglehart (2008) that human empowerment and values play an important role in the development of liberal democracies. The results suggest that democratisation is not necessarily associated with liberal democracies. The results are similar to Gorodnichenko and Roland (2021), in that they do not find a positive correlation between trust and democracy, measured by polity IV score.

There are many questions that this paper does not address. The main challenge for future research is to establish a causal relationship between trust and democratisation. Another avenue to be explored is to understand how different social capital values impact democratisation. Future work needs to go beyond the macro cross-country comparisons and investigate the interaction between trust and democratisation within-country.

Chapter 3

The Long Term Impact of Slavery on Trust in Brazil

3.1 Introduction

Slavery played a significant part in the Brazilian economy starting from 1532 through the mid-eighteenth century. Historians estimate that between the 15th century and 18th century, around 4.9 million slaves were brought to Brazil- more than any other country in the Americas (Klein and Luna, 2009). In recent years there has been a growing economic literature investigating the negative impact of slavery on economic development (Engerman and Sokoloff, 1997, 2002; Nunn, 2008; Soares et al., 2012; Acemoglu et al., 2012).

In the Brazilian context, there is mixed evidence concerning the impact of slavery on long-run development. Some studies find that slavery had a negative impact on socioeconomic outcomes (Naritomi et al., 2012; Musacchio et al., 2014; Fujiwara et al., 2017; Papadia, 2017).[1] On the other hand, some studies do not find strong evidence about the detrimental effect of slavery on education (de Carvalho Filho and Colistete, 2010), and income (Summerhill, 2010; Reis, 2017).

In this paper, I examine one of the channels through which slavery may affect contemporary socioeconomic outcomes in Brazil- trust. Levels of trust have been recently used to proxy social capital in the literature. The economic literature argues that social capital enhances economic growth and development since it improves the functioning of public institutions and helps overcome or reduce market imperfections, therefore facilitating economic transactions.[2] Trust is important for

[1] Only Fujiwara et al. (2017) and Papadia (2017) shows a direct link between slavery and current-day socioeconomic outcomes. Other studies present evidence that colonial institutions, dependent on slavery, were detrimental to long term development.

[2] for an excellent discussion regarding the importance of social capital to economics see Guiso

economic development (Knack and Keefer, 1997; Algan and Cahuc, 2010), institutional quality (La Porta et al., 1997), international trade (Greif, 1989) and firm management(Bloom et al., 2008). Furthermore, higher trust is associated with lower corruption (Uslaner, 2002), and greater life satisfaction (Helliwell, 2003).

Brazil is a particularly well-suited country to study the impact of slavery on trust for several reasons. (1) It received more slaves than any other nation in the Americas. (2) Slaves were distributed throughout the country and participated in different economic activities. (3) It was the last country in the western hemisphere to abolish slavery. (4) Brazil is a multiracial society that has avoided violent racial conflict.

To examine the relationship between slavery and current-day trust in Brazil, I combine historical slave data with contemporary data from the Latino Barometro survey (2002-2017). Using 14 waves of the Latino Barometer, I construct a sample with data for more than 500 Brazilian municipalities.[3] The first Brazilian census occurred in 1872 and identified the number of slaves in all of the 642 municipalities. In 2010- the year of the last census, Brazil had 5,565 municipalities. To match the location of slaves in 1872 to modern-day municipalities, I follow the approach developed by Ehrl (2017). The author creates time consistent minimum comparable areas (MCA) for Brazilian municipalities based on data from the Brazilian Institute of Geography and Statistics (IBGE).

I adopt two strategies to estimate the effect of slavery on current day trust in Brazil. First, I estimate a model controlling for year fixed effect and a broad range of controls. Moreover, I add state fixed effects, which means I control for state specific time invariant unobserved heterogeneity. Second, I investigate the possibility that only direct descendants of slaves have today lower levels of trust. The results obtained suggest that slavery did not have a significant effect on current trust levels in Brazil. The same applies to Brazilian of African and mixed ancestry.

The results obtained suggest that past slavery does not have an impact on current day trust levels in Brazil. I conduct a series of robustness checks to confirm the validity of the results. My first concern is that immigrants could be driving the results. Brazil received large waves of migrants from European countries and Japan. To address this concern, I exclude states that have a large percentage of non-Iberian migrants. A second concern is that a large MCA could distort my measurement of slavery. I drop large MCA from my model. Third, there is the possibility that younger municipalities did not experience the negative effect of slavery. I drop younger municipalities from my model. The results remain the same.

This paper contributes to the literature by investigating whether slave receiving

et al. (2011)

[3]Brazil is divided into 27 states and 5,565 municipalities (the lowest administrative unit). There are 5 geographical regions (North, Northeast, Central West, Southeast, and South)

countries witness a disruption of social capital due to their experience with the slave trade and slavery more in general. The effects described in the literature for slave exporting countries are not operating. By using municipality data, I can explore the heterogeneous nature of slavery in Brazil.

The remainder of the paper is organized as follows: In Section 2, I review the related literature. Section 3 provides a short overview of the historical background. Section 4 discusses the hypothesis. Section 5 describes the empirical strategy. Section 6 describes the data. Section 7 reports the results. Section 8 presents the robustness checks, and section 9 concludes.

3.2 Related Literature

This paper speaks to three strands of the economic literature. First, it is of interest to the broad trust literature, which explores the channels that affect the build-up of trust. Theoretical papers argue that trust is inherited and passed on unchanged from previous generations (Guiso et al., 2006; Tabellini, 2008a). Empirical papers find that trust is affected by both individual characteristics and community factors. Alesina and Ferrara (2000) using data for the United States concludes that traumatic experiences, historically discriminated groups, income inequality, and low levels of education are all correlated with lower trust. Bjørnskov (2006) finds that lower trust is associated with social polarization, income inequality, and ethnic diversity. Özcan and Bjørnskov (2011) finds an association between trust and human development. Furthermore, several studies in the economic literature find that historical experiences such as slavery (Nunn and Wantchekon, 2011), epidemics (Aassve et al., 2020) and one's ancestors (Uslaner, 2008) impact trust.

Second, this paper is related to the economic history literature in Brazil that investigates the impact of colonial activities on long term economic development. Summerhill (2010) constructs a dataset of agricultural inequality and finds that neither inequality nor slave intensity has a negative impact on economic development in the largest state in Brazil- Sao Paulo. de Carvalho Filho and Colistete (2010) investigates the impact that historical events have on public education 100 years later. The author does not identify an adverse effect of slavery on educational outcomes.[4] Reis (2017) finds a positive correlation between the proportion of slaves in 1872 and income per capita from 1920 to 2000. Naritomi et al. (2012) investigates local institutions in Brazil and concludes that municipalities that were heavily influenced by the sugar cane boom during colonial times have today higher land in-

[4] de Carvalho Filho and Colistete (2010) finds a positive relationship between slavery and current-day test scores. The authors attribute this to the fact that coffee-producing areas in the country's Southeast relied heavily on slave labour.

equality. Current-day municipalities in the gold boom region during colonial times have worse governance and less access to justice. Both economic activities (sugar cane production and gold exploration) were heavily dependent on slave labour. Mattos et al. (2012) argues that colonial institutions played a part in explaining current day socioeconomic outcomes. Fujiwara et al. (2017) adopts a spatial regression discontinuity framework and finds that municipalities that had a higher percentage of slaves in 1872 have higher inequality, educational imbalances, and worse public institutions. Papadia (2017) finds that slavery negatively affected the development of fiscal capacity and public good provision in two of the largest states in Brazil - Sao Paulo and Rio de Janeiro.

Third, this paper is of interest to the literature that studies the relationship between slavery and socioeconomic outcome. Engerman and Sokoloff (1997, 2002) in their seminal work on the legacy of slaves, argue that higher inequality developed in areas that had large plantations and relied on slave labour. Moreover, those areas experienced lower economic development. A growing number of studies confirm the negative association between slavery and economic outcome. Nunn (2008) finds that the slave trade negatively affected economic development in Africa. Soares et al. (2012) argues that slavery is correlated with higher levels of inequality today across the world. Acemoglu et al. (2012) concludes that areas that had more slaves in Colombia are more impoverished and have a lower provision of public goods. Bruhn and Gallego (2012) find that economic activities that relied on slave labour negatively affected economic development in the Americas.

More specifically, this paper complements other attempts in the literature to uncover the impact of slavery on current day trust. Nunn and Wantchekon (2011) explores the impact of slavery on trust levels in African nations. The authors argue that the slave trade in Africa created an environment of permanent distrust that persists until today due to two reasons. First, captured individuals from other tribes were taken as slaves. This created an insecure environment outside of local communities. Second, as the slave trade grew over time and became more lucrative in the African continent, individuals within the same community and ethnic group, including family members, were sold as slaves.[5] Charles (2017) examines the impact of slavery on current day trust levels in US states. She argues that slavery was a traumatic experience for those brought to the Americas. Slavery created a low trust environment that persists until today.

[5]For a detailed historical summary of slavery in Africa see Lovejoy (2011)

3.3 Historical Background

3.3.1 Brazilian Colonization

Portuguese explorers first arrived in Brazil in 1500. Semi-nomadic indigenous tribes that relied on hunting and small agriculture inhabited the Brazilian territory. To develop the colony, the Portuguese Crown decided to implement the Donatary Captaincies (DC) system, a model first used in the Azores Islands (Johnson, 1972). Under this model, the Portuguese government offered land to members of the Portuguese elites. In return for the land, landlords were responsible for the development of the settlement. Portugal divided the Brazilian territory into 17 DC in 1532. The DC divisions were primarily based on natural boundaries such as rivers (Cintra, 2013). The DC system ended in 1821, when the majority of the DC became states.

Portugal was a relatively small country and needed people to explore the vast Brazilian territory. The Portuguese first tried to enslave native indigenous people. However, this did not work since local tribes lived in a semi-nomadic way. Furthermore, many indigenous died due to diseases mainly brought by Europeans- smallpox and measles (Klein and Luna, 2009). Portugal relied heavily on slave labour to develop the Brazilian colony.[6] Historians estimate that more than 12 million slaves were taken out of Africa between the fifteenth and the eighteenth centuries, of which four million were brought to Brazil.[7]

3.3.2 Slavery and the Economy

Brazilian slavery is often portrayed as one in which small elites explored slave labour in large crop plantations (Prado Jr, 1945; Furtado, 1959). However, Brazilian colonial society was much more complex and diverse than other American colonies. Historical evidence suggests that slave ownership was widespread throughout the country, in both urban and rural households. Moreover, archival research has shown that slaves participated in different economic activities. Data from the first Brazilian census, conducted in 1872, show that the average slave owner in the country had between 5 and 8 slaves.[8] Klein and Luna (2009) estimate that as much as 30% of Brazilian society owned slaves.

There has been considerable debate in the literature regarding the character of

[6]Portugal implemented in Brazil an economic model based on extracting natural resources to export to European nations (Simonsen, 1937).

[7]Slave trade data was first compiled by Curtin (1969). There have been several revisions of slave trade data. For a recent discussion of slave trade data see Burnard (2012).

[8]The 1872 census provides detailed information on slave location in Brazil in the last decade before slavery was abolished.

Brazilian Slavery compared with other American colonies that relied on slave labour (Klein, 2012). Fenoaltea (1984) develops an extension of a simple transaction cost model that distinguishes between effort-intensive activities and care-intensive activities. For effort-intensive activities, it is possible to use coercive methods to maximize output. However, for activities that require some form of human capital, supervision can be costly. Historical evidence suggests that Brazilian slaves were not restricted to effort-intensive activities. Thus, the extent to which the argument that coercion and other dehumanizing practices were widely used against slaves in Brazil is ambiguous. Versiani (1994) argues that it would be rational for slave owners to motivate their slaves with positive rewards in order to maximize output in care-intensive activities.

Sugar cane plantation, throughout the coastal area in the Northeast region, was the primary economic activity from 1570 until 1670 (Simonsen, 1937; Schwartz, 1987).[9] Sugar cane production was characterized by large rural properties, known locally as "Engenho". The size of those farms varied; a small farm had between 60 and 100 slaves. A large farm could have more than 200 slaves (Simonsen, 1937). Society was highly polarized due to the powerful landlords. Violence and coercive methods were commonly used against the slaves to maximize output (Versiani, 1994). Nevertheless, agriculture activity was not restricted to large scale plantations. Small scale agriculture played an important role in the region (Schwartz, 1982; Versiani and Vergolino, 2002, 2003).

In the southeast of the country, gold and precious metals exploration were the principal economic activity. Starting in 1695, the slave population grew as explorers moved in search of a better life. Historical data on the enslavement in Minas Gerais during the Gold boom suggests that most slave owners had less than 20 slaves (Luna, 1980). In some cities in Minas Gerais, nearly half of the population owned slaves (da Costa, 1981). Brazilian gold production peaked during the 1760s and by the end of the 18th century declined (Fausto and Fausto, 1994). Reis (2005) argues that slaves that worked in gold and precious metals exploration in Minas Gerais had greater bargaining power. This occurred because Brazil did not have large and deep mines; instead, gold was found on the river's bottom. There were disadvantages to maltreat the slaves since they could not report their findings or even steal gold. During this period, many slaves managed to buy their freedom with the gold they found in the region.

Coffee production became the main economic activity in Rio de Janeiro and Sao Paulo states during the ninetieth century. Coffee plantations represented a large part of the economy after 1822, when Brazil became an independent country. At first, production was dependent on slave labour. After the Trans- Atlantic slave trade

[9]The first economic activity in the Northeast region was the exploration of brazilwood.

was abolished in 1850, landlords started to invest in new technology and gradually decreased their dependence on slave labour (Wagley, 1958). Coffee production was not restricted to large farms. In Sao Paulo, small scale agriculture contributed to the coffee boom towards the late 19th century. In the city of Taubaté, nearly half of coffee production in 1868 was produced in small farms (Marcondes, 1998, 2002).

As described above, slaves participated in Brazil's main commodity export cycles- sugar cane, gold, and later coffee. Nonetheless, slave activity was not restricted to the main economic activities. Slaves participated in cotton production in the state of Maranhão, an economic activity that boomed during the period 1790-1820 (Pereira, 2018). Slaves produced dried beef- locally called "charque". The majority of the production was sold on the domestic market (Klein and Luna, 2009).

Besides agricultural activity, slaves were present in urban centres. It was common for families to own a small number of slaves, which worked both as domestic workers and in low skill jobs. In the 1870s, 15% of the population of large cities were slaves[10] (Klein and Luna, 2009). Overall, there is a consensus that urban slaves had greater freedom than those who worked in agriculture. Freyre (1964) argues that domestic slaves who lived with their owners had a similar experience to that of poor Europeans dependent on wealthy relatives.

A significant number of slaves managed to become free. While some slaves bought their freedom, others managed to escape. Some slaves benefited from government programs that helped them gain freedom. Many former slaves moved into quilombos. The first quilombos were established in the sixteenth century. Besides former slaves, other marginalized groups in society- indigenous and low-income families also joined the quilombos (Amantino, 2003; Funari and de Carvalho, 2005). Quilombos varied in size; small quilombos could have 12 inhabitants. Historians estimate that the largest known quilombo (Palmares) in the present-day state of Alagoas had a population of 20,000 in 1660.[11] Historical evidence suggests that quilombos were not isolated communities. Inhabitants engaged in the production of agricultural goods and machinery (Flory, 1979).[12] [13]

Although slavery was a brutal and negative experience for enslaved people, it is difficult to generalize the Brazilian slave experience. Historical evidence suggests that slave ownership was widespread, and almost all sectors in the economy relied to some extent on slave labour. The management of slaves was very different, mainly due to the specifics of their employment activities.

[10] Cities with a population over 20,000 inhabitants.

[11] For a detailed historical overview of quilombos see Florentino and Amantino (2012).

[12] For a detailed description of economic activities in Brazilian quilombos see Flory (1979)

[13] The Brazilian constitution of 1988 formally recognized the existence of quilombo communities. They are officially known as *comunidades remanescentes de quilombo*. Today, 510 quilombos are officially recognized in 24 states. Other communities across the country are waiting for formal recognition.

3.4 Hypotheses

I develop my hypothesis by building on the determinants of trust literature, which argues that individual characteristics, socioeconomic environment and external shocks influence trust levels in society (Alesina and Ferrara, 2000). A priori, the impact of slavery on current day trust level in Brazil is not clear cut. There are several possible channels through which slavery may impact current day trust levels.[14] Thus, the empirical question is to test which one prevails, if any.

First, coercion, dehumanizing practices, and extreme polarization associated with slavery could have eroded trust in Brazilian colonial society. Low trust levels could persist through inter-generation transmission of social capital over time. Thus, Brazil can be trapped in a low trust equilibrium. This mechanism is consistent with models that suggest that cultural values and norms change slowly over time. Models developed by Bisin and Verdier (2001) and Tabellini (2008b) show that parents transmit to their children their own values and norms. Moreover, Guiso et al. (2008) argues that parents take a conservative approach to trustworthiness. This means that they would be biased toward conservative priors. Brazil was the last country in the Americas to abolish slavery. The negative effect slavery may have on trust would not fully dissipate. Evidence from the empirical literature supports the predictions that values and norms changes occur slowly over time (Antecol and Kuhn, 2000; Fernandez and Fogli, 2009; Aassve et al., 2021; Giuliano et al., 2004). Although it is reasonable to consider slavery a strong negative shock in the historical path of a society, the heterogeneous nature of Brazilian slavery makes it difficult to generalize its detrimental effect on trust.

Second, slavery may impact current day trust levels through institutions. Slavery may have contributed to the development of bad institutions, that in turn reduce trust levels in society. This scenario would be compatible with the model developed by Tabellini (2008b). Parents pass on to their children norms and values. Furthermore, parents participate in the political process and influence domestic institutions, which affect social capital. Naritomi et al. (2012) finds that colonial activity that relied heavily on slave labour had a negative impact on Brazilian municipal institutions. Nevertheless, Brazil never experienced legal racial segregation and violent conflict. There were no laws that explicitly discriminated against Brazil's black and mixed race population from a legal standing.

A third possible mechanism works through inequality. Slavery contributed to the development of a highly unequal society (Fujiwara et al., 2017), which in turn negatively affects trust. There is evidence that trust is lower in highly unequal societies

[14] The effects described in the literature for slave exporting countries- individuals turning against each other to sell them as slaves- are not operating. For a detailed discussion, see Nunn (2008)

(Knack and Keefer, 1997; Bjørnskov, 2006). This explanation would be consistent with the arguments made by Engerman and Sokoloff (1997) and Engerman and Sokoloff (2002). The authors argued that areas with large scale plantations that relied on slavery developed highly unequal societies. Brazil is among the most unequal countries in the world. There are persistent socio-economic differences between different regions and ethnic groups in the country. Black and Pardo households are, on average worst off economically when compared to white households. An example of the large inequalities in Brazil is observed in the remnant quilombo communities that survived until today.[15]

A fourth possible channel through which slavery may harm current day trust is through racism. Although the country did not experience legal segregation, racism and discrimination are still prevalent in Brazilian society. Recent papers found that there is discrimination in labour market (Barros et al., 2007), education (Botelho et al., 2015) and legal system (Cano, 2010; Harris, 2012).

To sum up, there are many channels through which slavery might impact Brazil's current-day trust levels. Different mechanisms described above point in different directions. I am incapable of exploring the impact of the different mechanisms discussed above on current day trust in Brazil. This paper aims to investigate if slavery has any impact on current day trust levels in Brazil.

3.5 Empirical Strategy

To estimate the effect of slavery on current day trust levels, I use the following econometric model:

$$Trust_{itm} = \beta Slaveintensity_{tm} + X_{it}\gamma + K_m\delta + Y_t + \alpha_s + \epsilon_{itm} \tag{3.1}$$

where i indicates individuals at time t at municipality m. My main trust variable is generalized trust. Alternatively, I use trust in government. β is my coefficient of interest. x denotes a series of individual-level characteristics. K is a series of municipality controls. Y denotes survey fixed effects. α denotes state fixed effects. ϵ_{itm} is the standardized error term clustered at the MCA. [16] I start with a parsimonious model in which I control only for individual characteristics. Then, following the results in Alesina and La Ferrara (2002), I gradually include a set of municipality socio-economic characteristics, geographic, and institutional controls.

[15] For a detailed discussion on quilombos today see Leite (2015).

[16] To correct for partial correlation in the error term, I cluster the standard errors at the MCA level.

As is common in many Latin American countries, generalized trust is very low in Brazil. Figure 3 shows that the majority of individuals that participated in the Latino Barometro Survey had low levels of generalized trust. Therefore, I follow the literature and use a logistic regression model to estimate the impact of past slavery on current day generalized trust.

One cannot rule out that perhaps only direct descendants of slaves still display lower trust levels, and when combined with the rest of the population at the municipality, the effect gets diluted. Recent waves of the Latino Barometro survey asks respondents to self identify their ethnic group. Widespread miscegenation since colonial times means that Brazil is a mixed-race society. A significant part of the population will be decedents of slaves. To capture the ethnic composition of the municipalities in the data set, I create an interaction term between individuals who self-identify themselves as black and mixed-race in the Latino Barometro and the average slave ratio of the municipality. I aim to capture trust levels of slaves descendent relative to the white population.

When conducting this kind of research, the main challenge is whether to interpret the results as a correlation or hold enough observations constant to interpret it as causal. Some control variables could be mediators- via which the effect of slavery on trust may run. For instance, income inequality. However, it can be challenging to distinguish mediators from confounders (which should be controlled for). This means that some of my control variables could be classified as bad controls. I present the results with and without bad controls to confirm the robustness of the results.[17]

3.6 Data

3.6.1 Latino Barometro Data

Trust data comes from the Latino Barometro. I combine 14 waves of the Latino Barometro covering the period from 2002-2017.[18] The final data set has more than 15,000 entries covering more than 500 municipalities. The standardised survey asks individuals questions about their values and beliefs. Each survey is conducted in Portuguese. I focus on two questions that measure generalised trust and trust in government.

The first question asks respondents: "Generally speaking, would you say that you

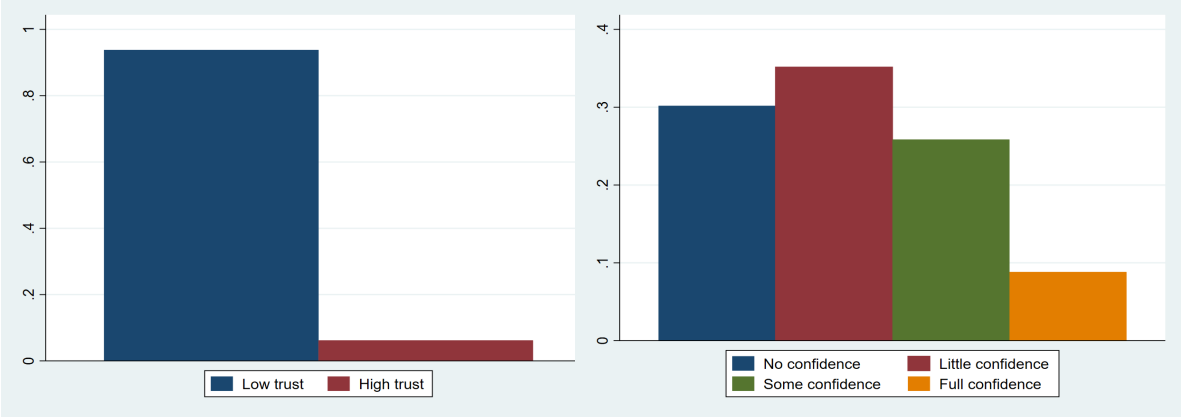
[17] for a discussion on what constitutes bad controls see Pei et al. (2019).

[18] In some years, the Latino Barometro survey was not conducted. I remove from the sample individuals who did not answer the question or answered do not know. Ethnicity data is available from 2007 onwards.

can trust most people ?" Respondents have two options- (1) one can never be too careful when dealing with others, or (2) most people can be trusted. The second question asks: "Generally speaking, do you trust the government?" Respondents choose between 4 answers: (1) no confidence at all, (2) little confidence, (3) some confidence and (4) a lot of confidence. Furthermore, I add a set of individual characteristics from each respondent recorded in the Latino Barometro: age, gender, education level, subjective income, subjective view on the current economic situation of the country, and ethnicity.

Figure 2 shows the fraction of individuals who trust others and trust their government. From the graph on the left, one can observe that generalized trust is very low in Brazil. The figure on the right side shows that most Brazilians have little or no confidence in their government.

Figure 3.1: Generalized Trust vs. Trust in Government



3.6.2 Slavery Data (Brazilian Census 1872)

Slavery data comes from the Brazilian Imperial census of 1872.[19] The census provides data for the 642 municipalities that existed in Brazil, along with the status (slave/ free) of the population. In 1872 Brazil had a population of 10 million, of which around 15 % were slaves. Slaves were present across the country. Figure 2 shows the current day boarder of Brazilian municipalities. Darker municipalities had slaves in 1872, the year of the first census.

I construct a measurement of slave intensity by dividing the number of slaves in each municipality over the total population. This gives a good indication of the proportion of slaves in each municipality. Although the Brazilian national statistics agency matches municipalities from the 1872 census to current day municipalities, it does

[19]The first nationwide census was conducted in 1872. Slave data is missing for 6 municipalities: Imperatriz (MA), Gurguéia (PI), Jeromenha (PI), Nossa Senhora da Purificação da Capella (SE), Itabaianna (SE) and Nossa Senhora das Dôres (Sergipe).

not consider new municipalities that were created by being dismembered from existing municipalities or annexed together. I rely on Ehrl (2017) to reaggregate back today's municipalities to the municipalities existing in 1872. Ehrl developed 481 time-consistent minimum comparable areas (MCA). Every one of the 5,565 Brazilian municipalities is assigned to a MCA.[20] I take a simple average of the slave ratio in each MCA. I then assign the slave ratio to each municipality within the minimum comparable area. The majority of Minimum comparable areas have at least one municipality that had slaves. If no municipality within the MCA had slaves, I assign a slave ratio of 0. I expect the impact of slavery on trust to be relatively the same in each MCA. Figure 3 displays a map of Brazil with municipalities and MCA. The fine lines show the current border of all 5,565 municipalities, and the dark black lines show all of the 481 MCA.

Figure 3.2: Slaves Location - 1872 Census

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Notes: Map shows the current day boundaries of Brazilian municipality. Darker municipalities had slaves at the time of the 1872 Brazilian census.

[20]Municipalities are the lowest administrative unit in Brazil. In the last census (2010) Brazil had 5,565 municipalities.

Figure 3.3: Municipalities Vs. Minimum Comparable Area

Notes: Figure 3 displays a map of Brazil. The light grey lines show the current boarders of the 5,565 Brazilian municipalities. The Black line shows the boarder of the 481 MCA. Source: Ehrl (2017)

3.6.3 Municipality Data

Brazilian socioeconomic data is from the Atlas of Human Development. I use five different variables: (1) employment, (2) Gini coefficient, (3) expected education, (4)income and (5) poverty. Geographical (municipality distance to equator & distance to coast) and institutional data comes from Naritomi et al. (2012). The municipality institutional quality score is calculated using local property tax and planning instruments. In addition, I have data on the year Brazilian municipalities were founded.[21]

3.6.4 Descriptive Statistics

Table 1 illustrates the summary statistics of the main variables. There are over 15,000 individuals in my sample. The average person is 40 years old. The youngest is 16 and the oldest 98. Education has a mean value of 3.4, meaning the average

[21]I thank Naritomi et al. (2012) for sharing geographic and institutional data. For a full description of the data, see the appendix. Data is consistent with their original source, unless otherwise stated.

individual in the sample has not completed secondary education. On average, individuals in my sample do not have enough financial resources at the end of the month. Furthermore, most of them are not very confident about the economic situation of the country. A considerable number of newer municipalities that did not have slaves are assigned a slave ratio of 0. This occurs because those municipalities were created after slavery was abolished. In the robustness checks, I exclude younger municipalities that did not experience slavery to confirm the robustness of the results.

Brazilian municipality data reflects the fact that the country is extremely unequal. Moreover, within the country, there is significant inequality between different regions. Municipalities have a high Gini coefficient. Formal employment is low, with around 40 % of the population part of the informal job market. Institutional quality is low. Regional differences can be observed by the standard deviation, which tends to be high in most municipality indicators.

Table 3.1: Descriptive Statistics

	obs	mean	sd	min	max
Dependent variable					
Generalized trust	15844	1.062	0.241	0	1
Trust government	15844	2.133	0.946	1	4
Individual controls					
Age	15844	39.378	16.588	16	98
Male	15844	0.483	0.500	0	1
Female	15844	0.517	0.500	0	1
Education	15844	3.451	1.749	1	7
Subjective income	15687	2.602	0.888	1	4
Country Econ. situation	15651	2.697	0.977	1	5
Slave Data					
Slave ratio	591	.1320819	.0910546	0	.522
Municipality controls					
Gini	591	.503198	.0605295	.36	.72
Formal employment	591	53.61	19.90247	5.19	84.31
Human development index	591	.697	.0757654	.49	.847
Expected years education	591	9.604	.9460394	6.03	12.13
Income per capita	591	636.40	308.0744	122.21	2000.29
Poverty rate	591	17.19	16.47431	.37	73.16
Geography controls					
Distance to equator	589	17.47939	8.244072	.1777	32.21114
Distance to coast	589	3.090	3.726	.00037	22.85417
Institutional controls					
Institutional quality	589	3.62	.93	1	5.85
Municipality foundation year	588	1906	85.09	1534	1997

Table 1 shows the descriptive statistics for the main variables used in the paper-number of observations (obs), the average (mean), the standard deviations (SD), the minimum (min) and the maximum value (max). See the appendix for a detailed description of the variable and sources.

3.7 Results

3.7.1 The Impact of Slavery on Generalized Trust and Trust Government

I start by reporting the results of the impact of slavery on current day generalized trust (Table 2). I use a ratio of the number of slaves over the total population in 1872 to measure the intensity of slavery in each Brazilian municipality at the time. I then assign a slave ratio to each municipality within the same MCA. In column (1) I control for year fixed effects. My coefficient of interest is positive and not statistically significant. This suggests that there is no negative correlation between past slavery and current-day trust. Moving to column (2), I control for individual characteristics. The trust literature has found that individual characteristics are an important determinant of trust levels. The control variables behave as expected. Older individuals, those with higher income and who answered in the survey that the country's current economic situation was good have a positive and robust effect on trust. The results suggest that gender does not affect trust levels. Moving to column (3), I add municipality socio-economic characteristics: Municipality income, education, poverty, human development index, and formal employment. There is no robust correlation between municipality socio-economic characteristics and trust levels. In column (4) I add geographic controls. I find that those municipalities that are further away from the equator have higher trust, and those furthest away from the sea have higher trust. Last, in column (5) I control for municipality foundation year and institutional quality. The idea here is that older municipalities may have been impacted by slavery as an institution, while younger municipalities never experienced slavery per say. Although all municipalities were to some extend impacted by slavery because slavery was widespread throughout the country. Nonetheless, I do find a negative association between institutional quality and trust.

In the remaining columns (6)- (10), I rerun the same regressions adding state fixed effect. Overall, except in column (6) and column (7), the coefficient of interest remains positive and not statistically significant. The results are similar to the ones discussed above. Individual characteristics show a robust and positive correlation with trust. Municipality socio-economic outcomes have no impact on trust levels.

Table 3.2: Effect of Slavery on Generalized Trust

Dep: Var: Trust	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Slave ratio	0.636	0.685	0.268	0.094	0.105	-0.188	-0.065	0.039	0.034	0.048
	(0.675)	(0.687)	(0.683)	(0.665)	(0.674)	(0.890)	(0.880)	(0.793)	(0.781)	(0.888)
Age		0.008***	0.008***	0.007***	0.007***		0.008***	0.008***	0.007***	0.007***
		(0.002)	(0.002)	(0.002)	(0.002)		(0.002)	(0.002)	(0.002)	(0.002)
Female		-0.051	-0.050	-0.047	-0.057		-0.056	-0.057	-0.053	-0.064
		(0.062)	(0.062)	(0.063)	(0.064)		(0.062)	(0.062)	(0.064)	(0.064)
Education		0.102***	0.088***	0.087***	0.085***		0.103***	0.090***	0.091***	0.089***
		(0.022)	(0.021)	(0.021)	(0.021)		(0.020)	(0.020)	(0.020)	(0.020)
Income		0.097**	0.097**	0.084**	0.086**		0.075*	0.080*	0.078*	0.079*
		(0.041)	(0.042)	(0.043)	(0.043)		(0.042)	(0.043)	(0.043)	(0.044)
Economy		0.315***	0.329***	0.323***	0.319***		0.312***	0.319***	0.315***	0.308***
		(0.042)	(0.044)	(0.044)	(0.045)		(0.043)	(0.044)	(0.045)	(0.045)
Mun. Income			1.828	2.994*	4.007**			2.625	2.573	2.595*
			(1.680)	(1.683)	(1.638)			(1.714)	(1.704)	(1.567)
HDI			-2.908	-2.485	-3.497			-1.670	-0.981	-2.047
			(5.018)	(4.776)	(4.550)			(4.477)	(4.499)	(4.234)
Education			-0.081	-0.105	-0.079			-0.053	-0.065	-0.009
			(0.123)	(0.114)	(0.109)			(0.112)	(0.118)	(0.114)
Poverty			-0.010	0.006	-0.004			0.008	0.013	0.008
			(0.018)	(0.018)	(0.018)			(0.016)	(0.016)	(0.016)
Employment			0.012	0.014	0.018*			0.015	0.015	0.021*
			(0.011)	(0.011)	(0.011)			(0.011)	(0.011)	(0.011)
Distance equator				0.036***	0.040***				0.017	0.033
				(0.011)	(0.010)				(0.028)	(0.028)
Distance sea				0.029**	0.032**				-0.003	0.024
				(0.014)	(0.015)				(0.039)	(0.039)
Foundation year					-0.001					-0.001**
					(0.000)					(0.001)
Institutions					-0.247***					-0.230***
					(0.079)					(0.085)
Constant	-3.480***	-5.123***	-3.735*	-5.381***	-3.605	-3.335***	-4.883***	-5.554***	-6.175***	-3.353
	(0.281)	(0.283)	(2.083)	(2.016)	(2.451)	(0.275)	(0.273)	(1.992)	(2.067)	(2.378)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations	15844	15503	15503	15316	15299	15844	15503	15503	15316	15299
Clusters	229	229	229	229	228	229	229	229	229	228

Standard errors in parentheses. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

In table 3, I report the results of the second trust variable - trust government. In column (1), I control for year fixed effect and state fixed effect. The coefficient of interest is negative. However, it is not statistically significant. It remains not statistically significant throughout all regressions. In column (2), I add individual controls. I find a positive and robust correlation between an individual age, income, economic view and trust. However, I find a negative correlation between education and trust government. This result suggests that individuals with more education have less trust in the government. I conjecture that given that corruption is widespread in the government, individuals with greater education may be more sceptical of the government. Nonetheless, the results is not statistically significant in the subsequent columns. In column (3), I add municipality controls. The pattern repeats itself, except for formal employment. Municipality income, human development index, education, and poverty do not have any robust impact on trust levels. However, the results suggest that formal employment has a negative impact on trust government. Individuals who are more educated have a greater chance of being in formal employment. I then proceed to add geographic controls (column 4). I find that being distant from the sea has a slight positive impact on government trust. Last, I control for foundation year and institutional quality. The results suggest that they do not have any significant impact on trust government. In columns (6) - (10) I rerun the regressions adding state fixed effect. As is the previous case, the coefficient of interest remains statistically not significant.

As discussed in the empirical strategy section, some of the controls used to estimate the model above could be classified as bad controls. For instance, part of the Brazilian economic history literature argues that slavery impaired economic development (Fujiwara et al., 2017). Therefore, to confirm the robustness of the results, I rerun the regressions excluding municipality and institutional controls. The coefficient of interest remains statistically insignificant. I report the results in the Appendix.

Overall, the results suggest that there is no negative correlation between the average slave ratio in a given municipality and current-day generalized trust and trust in government in Brazil. As previously discussed in the hypothesis section, several channels could explain the results. For instance, Brazilian slave history and the widespread miscegenation in Brazilian society. Furthermore, the data suggests that trust is low across the country. Therefore, slavery may not impact trust.

Table 3.3: Effect of Slavery on Trust Government

Dep: Var: Government Trust	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
Slave ratio	-0.213	-0.141	0.052	0.099	0.105	-0.013	0.004	0.099	0.100	0.145
	(0.181)	(0.139)	(0.111)	(0.112)	(0.113)	(0.180)	(0.161)	(0.163)	(0.162)	(0.166)
Age		0.005***	0.005***	0.005***	0.005***		0.005***	0.005***	0.005***	0.005***
		(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)
Female		-0.025**	-0.026**	-0.025**	-0.025**		-0.027**	-0.027**	-0.027**	-0.027**
		(0.012)	(0.012)	(0.012)	(0.012)		(0.012)	(0.012)	(0.012)	(0.012)
Education		-0.020***	-0.006	-0.006	-0.006		-0.013***	-0.005	-0.005	-0.005
		(0.004)	(0.004)	(0.004)	(0.004)		(0.004)	(0.004)	(0.004)	(0.004)
Income		0.018*	0.027***	0.027***	0.027***		0.024***	0.025***	0.025***	0.025***
		(0.010)	(0.009)	(0.009)	(0.009)		(0.009)	(0.009)	(0.009)	(0.009)
Economy		0.277***	0.263***	0.262***	0.262***		0.267***	0.260***	0.259***	0.258***
		(0.008)	(0.009)	(0.009)	(0.009)		(0.009)	(0.009)	(0.009)	(0.009)
Mun. Income			0.054	0.021	-0.031			0.020	0.027	-0.189
			(0.249)	(0.258)	(0.300)			(0.258)	(0.258)	(0.297)
HDI			-0.792	-0.733	-0.764			-0.473	-0.505	-0.539
			(0.639)	(0.668)	(0.664)			(0.611)	(0.634)	(0.615)
Education			0.020	0.021	0.023			0.024	0.025	0.030
			(0.019)	(0.019)	(0.019)			(0.018)	(0.019)	(0.018)
Poverty			0.001	0.002	0.002			0.003	0.003	0.003
			(0.002)	(0.003)	(0.003)			(0.002)	(0.003)	(0.003)
Employment			-0.003*	-0.003*	-0.002*			-0.002	-0.002	-0.002
			(0.001)	(0.001)	(0.001)			(0.002)	(0.002)	(0.002)
Distance equator				-0.000	-0.000				-0.003	-0.003
				(0.002)	(0.002)				(0.004)	(0.004)
Distance sea				0.003*	0.004*				0.002	0.006
				(0.002)	(0.002)				(0.006)	(0.006)
Foundation year					-0.000					-0.000**
					(0.000)					(0.000)
Institutions					-0.003					-0.013
					(0.014)					(0.014)
Constant	1.963***	1.137***	1.566***	1.493***	1.644***	1.983***	1.121***	1.289***	1.316***	1.842***
	(0.068)	(0.064)	(0.281)	(0.298)	(0.367)	(0.055)	(0.062)	(0.286)	(0.343)	(0.392)
Year FE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
State FE	No	No	No	No	No	Yes	Yes	Yes	Yes	Yes
Observations	15844	15503	15503	15316	15299	15844	15503	15503	15316	15299
R Square	0.114	0.196	0.209	0.209	0.209	0.130	0.206	0.212	0.212	0.212
Clusters	229	229	229	229	228	229	229	229	229	228

Standard errors in parentheses
* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

3.7.2 The Impact of Slavery on Trust for Slave Decedents

The lack of statistical significance in the results so far may be due to a heterogeneous impact across individuals in my sample. For instance, perhaps only direct descendants of slaves display different trust levels, and when combined with the rest of the population at the municipality, the effect gets diluted. To address this concern, I estimate the impact of trust on slave decedents.

Different from what occurred in other countries in the Americas, there was widespread miscegenation. This is reflected in the current day population. In the last Brazilian census (2010), 43% of the population was classified as Pardos- a term used to classify Brazilian of mixed ethnic ancestries. Therefore, I consider slaves descendants individuals who self identify as black, mulato or mestizo. There is evidence that mixed-race individuals were enslaved in Brazil (Bergad, 2006). Figure 4 shows the ethnic distribution in my sample. Nearly 50% of the sample have self-identified as white, the largest group. The other large groups are Mestizo, Mulato and Black.

Remnant quilombos communities that survived until today are direct descendants of slaves. Quilombos were formed by slaves that were freed or escaped. The first quilombos were established in the sixteenth century. Besides former slaves, other marginalized groups in society- indigenous and low-income families also joined the quilombos. Quilombos varied in size; small quilombos could have 12 inhabitants. On the other hand, historians estimate that the largest known quilombo (Palmares) in the present-day state of Alagoas had a population of 20,000 in 1660. Quilombo communities exist until today and have been legally recognized by the federal government. Unfortunately, I do not have individual survey data from current day quilombos. Therefore, I assume that anyone who self-identifies as black, pardo or mestizo are slave decedents. In Brazil, race is the main criteria that distinguish between ethnic group. Black and pardo households are, on average worst off economically when compared to white households. There are significant racial imbalances in the country.

Figure 3.4: Latino Barometro- Ethnicity

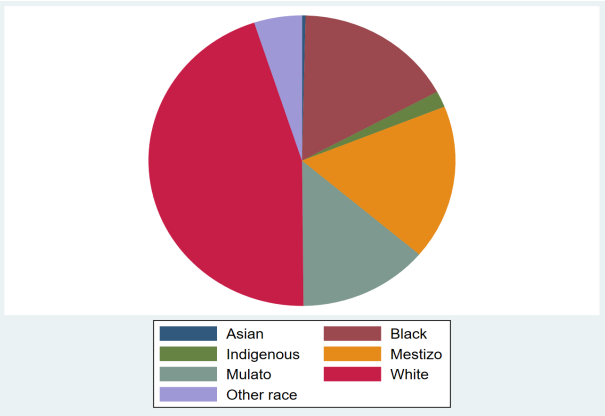

Table 4 reports the results of slave ratio on current day trust levels, including the interaction term between slave ratio and individuals self-identified ethnicity. The number of observations is lower than the previous tables due to missing data. Earlier waves of the Latino Barometro did not ask individuals about their ethnicity. Furthermore, some of the respondents did not answer the ethnicity question. The coefficient of interest, the interaction term between slave ratio and individuals ethnicity remain not statistically significant in all three cases. Table 5 reports the results for trust government. The results follow the pattern of the previous table (4). The coefficient of interest is not statistically significant. In column (1), the slave ratio coefficient is negative and statistically significant. However, once I add individual controls, the coefficient becomes statistically insignificant.

The data suggests no negative relationship between those who self identify as black, mulato and mestizo and generalized trust. A possible reason for this is the relative peaceful race relations in the country. Another possible explanation is the low levels of generalized trust across the population, irrespective of ethnicity or past presence of slaves.

How do these findings fit within the literature? Nunn and Wantchekon (2011) finds that the slave trade damaged trust levels in African countries. However, the mechanism for slave exporting countries is different from those receiving slaves. Charles (2017) argue that low levels of trust can be traced back to slavery. She does a cross country comparison using the Americas as a case study. Cross country studies may not consider the unique local characteristics of a country. Second, Charles also studies the impact of slavery in the United States. Nonetheless, the United States experience with slavery and its subsequent development was different from that of Brazil.

Table 3.4: Effect of Slavery on Generalized Trust- Slave Decedents

Dependent variable: Generalized Trust	(1)	(2)	(3)	(4)	(5)
Slave ratio	0.996	1.020	0.386	0.213	0.146
	(0.889)	(0.898)	(0.902)	(0.896)	(0.882)
Black	0.016	-0.003	-0.037	0.078	0.034
	(0.186)	(0.198)	(0.199)	(0.198)	(0.194)
Black × Slave ratio	0.323	0.709	0.745	0.504	0.774
	(1.177)	(1.223)	(1.214)	(1.216)	(1.182)
Mestizo	-0.180	-0.111	-0.130	0.037	0.032
	(0.215)	(0.217)	(0.222)	(0.225)	(0.224)
Mestizo × slave ratio	1.326	1.331	1.318	0.929	0.974
	(1.028)	(1.010)	(1.047)	(1.101)	(1.129)
Mulato	-0.008	0.058	0.076	0.258	0.252
	(0.277)	(0.264)	(0.267)	(0.262)	(0.256)
Mulato × slave ratio	-0.142	0.014	-0.095	-0.623	-0.489
	(1.809)	(1.711)	(1.714)	(1.739)	(1.699)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓
Observations	10,174	9,957	9,957	9,855	9,838

Notes: This table includes two interaction terms between ethnicity (Black, Mulato and Mestizo) and slave ratio. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator and distance to the coast. Institutional control includes index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Table 3.5: Effect of Slavery on Trust Government- Slave Decedents

Dependent variable: Trust Government	(1)	(2)	(3)	(4)	(5)
Slave ratio	-0.383**	-0.254	-0.128	-0.073	-0.078
	(0.181)	(0.166)	(0.174)	(0.168)	(0.167)
Black	0.007	0.021	-0.003	-0.013	-0.013
	(0.051)	(0.048)	(0.047)	(0.050)	(0.050)
Black × slave ratio	0.220	0.156	0.237	0.264	0.263
	(0.242)	(0.232)	(0.237)	(0.242)	(0.242)
Mestizo	-0.012	0.001	-0.049	-0.062	-0.063
	(0.051)	(0.048)	(0.045)	(0.045)	(0.045)
Mestizo × slave ratio	0.374	0.314	0.475	0.512	0.513
	(0.393)	(0.398)	(0.389)	(0.390)	(0.390)
Mulato	0.025	0.029	-0.012	-0.030	-0.030
	(0.046)	(0.047)	(0.043)	(0.043)	(0.043)
Mulato × slave ratio	0.073	0.037	0.087	0.149	0.149
	(0.308)	(0.291)	(0.275)	(0.276)	(0.275)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓
Observations	10,174	9,957	9,957	9,855	9,838
R^2	0.157	0.230	0.241	0.242	0.242

Notes: This table includes two interaction terms between ethnicity (Black, Mulato and Mestizo) and slave ratio. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator and distance to the coast. Institutional control includes index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

3.8 Robustness Checks

The results obtained in this paper suggest that slavery does not have an impact on current day levels of trust in Brazil. In this subsection, I investigate whether some Brazilian states in the data sample may be causing the lack of significance reported so far.

Immigration

Towards the end of the 19th century, the number of immigrants arriving in Brazil grew exponentially. The country needed workers due to the abolition of slavery in 1888 and rapid industrialization. There was a need for new workers. This trend continued throughout the first half of the 20th century. The main groups were Portuguese, Spanish, Italian, Germans, East Europeans and Japanese (Levy, 1974). Uslaner (2008) argues that a person's ethnic background in the United States affects current day trust levels. A potential concern is that some states in Brazil have a higher percentage of people whose ancestors are European or Japanese. European and Japanese immigrant descendants may have higher trust levels. This could dilute the effect of slavery on current day trust. To address this concern, I estimate my main model excluding states in the Southern region of Brazil and the states of Rio de Janeiro and Sao Paulo. Those states have a higher percentage of non- Iberian immigrants.[22] The results in Tables 6 and 7 shows that the coefficient of interest remains insignificant.

[22]The Brazilian census does not include questions on the population's ancestry. I drop states based on estimations made by Monasterio (2017). The author applies machine learning techniques to estimate migration to Brazil based on surnames.

Table 3.6: Robustness- Effect of Slavery on Generalized Trust

Dependent variable: Generalized trust	(1)	(2)	(3)	(4)	(5)
Slave ratio	1.319	1.397	0.667	0.421	0.033
	(1.525)	(1.560)	(1.559)	(1.626)	(1.601)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding the Southern region and the states of Rio de Janeiro Sao Paulo. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator & distance to the coast. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Table 3.7: Robustness- Effect of Slavery on Trust Government

Dependent variable: Trust Government	(1)	(2)	(3)	(4)	(5)
Slave ratio	-0.133	-0.126	0.154	0.262	0.232
	(0.295)	(0.249)	(0.247)	(0.287)	(0.284)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding the Southern region and the state of Rio de Janeiro. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator, distance to the coast, altitude and average temperature. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Minimum Comparable Areas

Since the first Brazilian census in 1872, there has been a significant increase in the number of municipalities. To reaggregate back today's municipalities to those existing in 1872, I follow the Brazilian economic history literature and use time-consistence MCA. However, as Figure 3 shows, there are some extensive MCA. Especially those furthest away from the coast. The slave average at large MCA may potentially generate bias results. To address this concern, I run my primary model, excluding municipalities in the largest MCA (Tables 8 and 9).[23]

Table 3.8: Robustness- Effect of Slavery on Generalized Trust

Dependent variable: Generalized Trust	(1)	(2)	(3)	(4)	(5)
Slave ratio	-0.107	0.016	0.035	-0.018	-0.007
	(0.884)	(0.874)	(0.784)	(0.777)	(0.881)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding municipalities in large MCA. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator & distance to the coast. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Table 3.9: Robustness- Effect of Slavery on Trust Government

Dependent variable: Trust Government	(1)	(2)	(3)	(4)	(5)
Slave ratio	-0.035	-0.014	0.073	0.078	0.134
	(0.182)	(0.162)	(0.166)	(0.160)	(0.164)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding municipalities in large MCA. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator & distance to the coast. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

[23] I exclude states in the North and Central West regions.

Younger Municipalities

The number of Brazilian municipalities grew exponentially during the 20th century. There exists the possibility that newer municipalities, created after slavery was abolished, were not heavily influenced by slavery. If this is the case, one can argue that slavery may not affect trust dynamics in younger municipalities. To show that younger municipalities are not driving the results, I estimate my main model excluding municipalities created after 1920. The results are not affected in tables 10 and 11.

Table 3.10: Robustness- Effect of Slavery on Generalized Trust

Dependent variable: Generalized Trust	(1)	(2)	(3)	(4)	(5)
slave ratio	1.031	1.006	0.601	0.317	0.256
	(0.779)	(0.782)	(0.789)	(0.763)	(0.729)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding younger municipalities. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator & distance to the coast. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Table 3.11: Robustness- Effect of Slavery on Trust government

Dependent variable: Generalized Trust	(1)	(2)	(3)	(4)	(5)
Slave ratio	-0.047	-0.068	0.134	0.172	0.156
	(0.196)	(0.157)	(0.134)	(0.131)	(0.132)
Individual controls		✓	✓	✓	✓
Municipality controls			✓	✓	✓
Geographic controls				✓	✓
Institutional controls					✓
Year FE	✓	✓	✓	✓	✓

Notes: This table shows results excluding younger municipalities. Individual controls include respondents characteristics and subjective view on the economy. Municipality controls include several socioeconomic indicators. Geographic controls include distance to equator & distance to the coast. Institutional control include index of institutional quality and municipality foundation year. FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

3.9 Conclusion

In recent years there has been a growing literature that stresses the importance of trust to socioeconomic outcomes. The literature argues that current day trust is determined through a combination of individual/ community characteristics and long term historical events. This paper contributes to the literature by investigating the impact that slavery has on current day generalized trust and trust in government in Brazil. In doing so, it focuses on a question that has been largely neglected in the literature so far- the impact of slavery on social capital in receiving nations.

I combine historical slave data with recent trust data from the Latino Barometer. Overall, the results obtained suggest that slavery does not significantly impact current-day generalized trust or trust in government in Brazil. This is also true for Brazilians of African and mixed ancestry. Robustness check suggests that the results are not driven by foreign immigration, measurement of slave intensity (MCA) or municipality age.

For future work, I see two possible avenues. First, one can further explore the impact of other colonial activities on current day trust in Brazil. Second, there is the possibility to investigate further the impact of the heterogeneity of slavery on social capital and socioeconomic outcomes. In doing so, one should consider other sources of information on slavery besides the 1872 Brazilian census.

Chapter 4

The Cost of Institutional Tinkering-Evidence From the Portuguese Language Reform

4.1 Introduction

Several countries have implemented language reforms over the years. All have in common the national government forcing mandatory changes to the written language. Most of the reforms primary objective was to simplify grammar rules. For instance, China enacted several spelling reforms during the 20th century to simplify Chinese characters. The first occurred in 1956 and was followed by further reforms in 1964 and 1986 (Rohsenow, 2004). More recently, in 1996, governments in several German-speaking European countries agreed to standardize the spelling of words.[1] [2] Other countries have implemented language reforms for nationalistic purposes. This was the case with Turkey during the 1930s. The country purified the language by abolishing words taken from Arabic and Persian and added new technical words (Tachau, 1964).

In spite of the relevance of language for education, tourism, trade and commerce, the economics literature has largely neglected the relationship between language and socioeconomic outcome. There remain open questions regarding the cost and benefits of implementing changes to a given language. This paper helps answer this question by exploiting the impact of the 1990 Portuguese orthography reform on Portuguese and Brazilian students PISA results (Programme for International Student Assessment).

[1] Germany, Austria, Liechtenstein and Switzerland. Luxembourg did not participate in the reform.

[2] For a comprehensive perspective of the reform see Johnson (2000).

Understanding the impact of the Portuguese language reform on students PISA outcomes is important for three reasons. First, Economic theory and empirical studies suggest that skills and knowledge impact economic development and growth (Krueger and Lindahl, 2001; De la Fuente and Doménech, 2006; Cohen and Soto, 2007). Second, it may allow for a more accurate interpretation of PISA results for Portuguese and Brazilian students. Third, it shed lights on the need for policymakers to design appropriate policy to mitigate the impact of future language reforms.

Portuguese is the sixth most spoken language in the world with a total of 250 million speakers, of which 215 -220 million are native speakers.[3] The Portuguese orthography reform agreement signed in 1990 established a single and unified orthography to be used by all Portuguese speaking countries.[4] Although Portugal and its former colonies shared the same language, there were significant differences in orthography.[5] The reform simplified the Portuguese language by changing the spelling of words so that they are closer to the way they are pronounced. The reform aimed to bring economic and cultural benefits- standardize legal documents, increase market integration, and raise the Portuguese language's international status.

Brazil and Portugal are particularly well-suited countries to study the impact of language reforms due to the period in which the reform was implemented - towards the end of the last decade (2009-2015). We are interested in evaluating the impact of the reform on human capital. PISA data availability means we can study the impact of the reform had on students in both countries.

We develop our hypothesis by building on the linguistic literature. Language reforms have been controversial throughout history (Singh, 1975). Language is an integral part of group identity, and changes can lead to social and psychological reactions.[6] We predict that the reform will have a greater impact on Portuguese students than Brazilian students for two reasons. First, Portugal experienced far more word changes, whereas Brazil observed fewer changes because their writing was already much closer to the new rules. An estimate of 1.6 percent of Portuguese words was affected in Portugal. This compares to an estimate of 0.8 percent in Brazil. Second, the orthographic reform faced significant public opposition in Portugal. Critics argued that the reform was an interference in their culture since language is part of their cultural heritage. Critics view the reform as a Brazilianization of their language. Opponents of the reform petitioned the Portuguese National Assembly

[3]Portuguese is the sole official language of Portugal, Brazil, Cape Verde, Mozambique, Guinea-Bissau, Angola and Sao Tome and Principe. Furthermore, it has official status in East Timor, Equatorial Guinea and Macau Special Administrative Region (China).

[4]except East Timor, which was under Indonesian occupation at the time. It later signed the Agreement in 2004

[5]big differences were observed between Portugal and Brazil. Other Portuguese speaking countries spelling was similar to Portugal

[6]for more details see Edwards (2009)

against the reform without success.[7] The following comment on an internet news page encapsulates the sentiments of many Portuguese citizens.[8]

"Is standardisation of language destroying free thinking and therefore cultural diversity... with institutionally imposed rules?"
Tatiana Vaz Pereira, 2015

This paper is unable to discern the precise causal mechanisms through which the reform will affect Portuguese students. Nonetheless, there are three possible channels: (1) students need to learn and adapt to the new rules. This should impact students in formal education in particular. (2) Parents will need time to learn the new rules; therefore, they may reduce parental involvement in helping their children.[9] (3) School teachers will need to dedicate more time to learn the new orthographic rules and have less time to plan and prepare their classes.

To test our hypothesis, we adopt a difference in difference framework using two waves of PISA data (2009 & 2018) to estimate the reform's impact on students PISA exam scores.[10] PISA measures 15 years old students' knowledge of mathematics, reading and science. The test results are comparable between countries and across different waves, meaning we can investigate the impact of the reform on test results during and after the transition period. Although the official orthographic treaty was signed in 1990, the reform was implemented nearly 20 years later. For both Brazil and Portugal, there was a transition period from 2009 until 2015.[11] In our estimates, we exploit the different impact that the Portuguese Language reform had in Portugal and Brazil.[12] Our main strategy is a triple diff in diff model. Our primary assumption is that the treatment would be felt more intensely in Portugal than in Brazil. Furthermore, we argue that it will affect the reading score. As a second strategy, we use data for Brazil and Portugal to run a simple diff in diff. We want to confirm our assumption that the Portuguese language reform affects PISA reading score for Portuguese students.

The results obtained confirm our hypothesis that the Portuguese language reform had a detrimental effect on Portuguese students PISA scores. The same cannot be observed for Brazilian students, which were less affected by the reform. Our findings suggest that language reforms can have a detrimental short term effect on students

[7] https://www.telegraph.co.uk/expat/expatnews/7344925/Spelling-reform-causes-Portuguese-headache
html

[8] https://www.euronews.com/2015/05/14/portuguese-language-reform-law-goes-global

[9] De Philippis and Rossi (2021) finds that parental influence can explain cross-country gaps in human capital.

[10] PISA tests is organized by the Organisation for Economic Co-operation and Development (OECD). Although Brazil is not a member of the OECD, it was invited to participate in PISA test since the first year (2000).

[11] The transition period for Brazil was from January 1, 2009, until December 31, 2015. For Portugal, it was from May 13, 2009, until May 12, 2015

[12] Around 1.6% words were affected in Portugal, compared to 0.8% of words in Brazil

education. To confirm for the existence of differential pre-trends, we estimate the model using previous PISA survey (2000 - 2009). The results of our falsification exercises support our hypothesis.

This study enriches the growing economics of language literature. To the best of our knowledge, this is the first paper that attempts to study the short term impact of any language reform on students Pisa outcomes.

The remainder of this paper is as follows—section 2 reviews the human capital and language literature. Section 3 presents the historical background of the Portuguese language reform and explains the main changes implemented by the reform in both countries- Brazil and Portugal. Section 4 describes the data and empirical strategy. Section 5 discusses the results and the robustness tests. Section 6 concludes.

4.2 Related Literature

This paper is related to 3 different strands of the literature. From a broad perspective, this paper is of interest to the human capital literature. Economic theory emphasizes the importance of human capital - the ability and skills set of the population for economic development and growth.[13] Education impacts economic growth and development through three main channels. First, education improves human capital that raises productivity in the economy (Gregory et al., 1992). Second, education can lead to an increase in innovation and new technologies that lead to higher output (Romer, 1990; Howitt and Aghion, 1998). Third, education facilitates the diffusion and transmission of knowledge and technologies across different countries, contributing to higher economic growth (Nelson and Phelps, 1966; Benhabib and Spiegel, 1994)

Jacob (1974) was the first to estimate the return to schooling using data from the United States. Since his seminal article, a large body of work has investigated the impact of human capital on economic growth and development with mixed results. Micro econometric studies have found a positive association between education and income (Card, 1999; Hanushek and Woessmann, 2016). However, several cross country studies found no correlation between education and economic development and growth (Topel, 1999). Bassanini and Scarpetta (2002) argue that the lack of a positive association between human capital and economic growth in macro growth regressions are due to measurement error and poor quality data. Hanushek and Woessmann (2008) points out that years in school is not a good proxy for education. School quality is a better measurement of educational outcomes. Furthermore, Hanushek and Woessmann (2012) argues that international exams results are an ef-

[13]For an overview of the literature see Hanushek and Woessmann (2008).

ficient way to measure individual cognitive skills. Using international test scores, we aim to capture the true impact of the Portuguese language reform on human capital stocks. Krueger and Lindahl (2001) argues that increases in human capital lead to higher economic growth. Similarly, both De la Fuente and Doménech (2006), and Cohen and Soto (2007) find that the macro return to education is similar to that reported in labour studies.

Second, this paper is related to the linguistic literature. Language is an important part of our identity, together with ethnic, national, religious and gender. Language reform is especially costly to those individuals who need to adapt and change due to the reforms (Edwards, 2009). Therefore language reforms have been controversial and have mixed results. Ball (1999) compares the French and German spelling reform and argues that while both faced significant opposition from different segments of society, the German reform were successful while the French were not. Reyes (2013) studies users comment to an article about the Spanish language reform and finds that there are mainly negative comments from users concerning the reform. The author argues that this occurs because the reform affects readers own education, besides their identity. Moreover, the language literature also discusses the impact that teachers have on the success of language reforms. Teachers and schools play a vital role in implementing reforms. (Ricento and Hornberger, 1996; Vongalis-Macrow, 2007; Menken and García, 2010).

Third, this paper is related to the economics of language literature. Marschak (1965) was the first to introduce a cost and benefits analysis of language in the economic literature.[14] Following his work, many studies have researched the impact of language on economic variables. Language affects international trade (Tinbergen, 1962), migration patterns (Chiswick and Miller, 1992), economic policies and the provision of public goods (Easterly and Levine, 1997), and multinational corporations and financial markets (Marschan-Piekkari et al., 1999; Ginsburgh and Weber, 2011).

4.3 Portuguese Language Agreement

4.3.1 Historical Background

During the 20th century, several language reforms occurred in Portugal and Brazil. Furthermore, several attempts were made to agree on a common spelling for both countries.[15]

[14] For a detailed summary of the Economics of Language literature see Ginsburgh et al. (2016).

[15] For an excellent summary of previous attempts to reform the Portuguese language, see Tavares and Ricardo (2009).

One of the first attempts to reform the Portuguese language occurred in 1911. The Portuguese government at the time established a commission to work on proposals to reform the language and simplify the spelling of words. The commission in charge of the reform proposed significant changes to the spelling of words. The 1911 reforms did not suffer from any strong opposition in Portugal. However, it faced significant opposition in Brazil, which was not part of the process. Brazil never adopted the reform, and as a result, there were significant differences in spelling across both countries.

In 1915 we had the first non-official agreement between Portugal and Brazil. The Brazilian Academy of letters decided to adopt the same rules as Portugal. However, a few years later, in 1919, the Brazilian Academy revoked its previous decision. In 1929 the Brazilian academy of letters agreed to make changes to the spelling of words. In 1931 both the Lisbon Academy of science and the Brazilian Academy of letters sign an agreement to unify and simplify the Portuguese language. Despite the original intentions of both countries, it was never implemented.

During the 1940s, both Brazil and Portugal implement changes to their orthography norms. In 1971 the Brazilian government adopted a new law that simplified the Portuguese language. The reform significantly increased the differences between Portuguese language spelling in both countries. In 1975 there was a growing desire in both the Brazilian Academy of Letters and the Portuguese Academy of Science to unify the Portuguese language. Both academies agree on a project to unify the language. In 1986, members of the CPLP (Community of Portuguese Language Countries) agreed on the need for a common and unified language. In 1990 the agreement was signed by all Portuguese speaking countries. The reform was due to be implemented in 1994. However, the agreement was not ratified by all countries. In 2004, leaders of the CPLP met in São Tomé and Príncipe and agreed to implement the reform starting from 2009.

4.3.2 Portuguese Language Reform

The Portuguese language reform made significant changes to the spelling of Portuguese words. All Portuguese speaking countries were affected. However, the reform made more considerable changes to the way words were spelt in Portugal. Some words kept the spelling used in Portugal. In other words, the Brazilian spelling was adopted. Furthermore, for a group of words, there was a new spelling, never used before. To complicate matters further, for some words, two different spellings were acceptable after the reform.[16] The main points of the reform can be summarized as

[16]For a comprehensive discussion on the new grammatical rules of the Portuguese language reform see Silva (2012).

follows.

- There were changes to the alphabet and rules concerning the use of capital letters. The letters W, K and Y, were formally added to the Portuguese alphabet. Those letters were already commonly used in Portuguese speaking countries due to the increased influence of the English language. The reform altered the spelling of months and seasons, which are now written without capital letters.

- Several changes were made to bring the spelling of words closer to how they are pronounced. For instance, the consonants P and C were removed from the spelling of words when they were silent. Words that terminated with êem lost their orthographic accent. Furthermore, the circumflex accent is lost in several words.

- There were changes to rules surrounding compound words. Many compound words lost the hyphen. Monosyllabic forms of verbs also lost the hyphen. Moreover, many compound words are joined together by adding an r or s.

The Tables below respectively show changes made to words in Portugal and Brazil. In the first column, we have the correct spelling before the reform. The second column shows the correct spelling after the reform. The third column describes the changes made to the spelling of the word.

Spelling changes: Portugal		
Before	After	Change
acção	ação	delete c
adoptar	adotar	delete p
objectivo	objetivo	delete c
seleccionar	selecionar	delete c
há-de	há de	delete hifen

Spelling changes: Brazil		
Before	After	Change
idéia	ideia	accent
enjôo	enjoo	accent
qüinqüênio	quinquênio	tréma
Cingapura	Singapura	first letter
pingüim	pinguim	tréma

4.4 Data and Identification Strategy

4.4.1 Brazil and Portugal PISA Performance

4.4.2 PISA

To test the impact of the reform, we use two waves of PISA data (2009 & 2018). The first PISA tests occurred in the year 2000. Since then, the tests have occurred every three years. It assesses students knowledge in three main disciplines- reading, science and mathematics. Pisa selects a sample that is nationally representative to take the tests. Students need to be between the ages of 15 years and 3 months and 16 years and 2 months and enrolled in an educational institution at grade 7 or higher.[17] [18] Furthermore, Pisa collects socioeconomic data about the students that take part in the exam and data about the school.

PISA assesses students' knowledge in reading, mathematics, and science in each test. However, each assessment cycle focuses on one main discipline. We chose the year 2009 and 2018 because reading was the main focus of the exam. The OECD defines reading performance as "the capacity to understand, use and reflect on written texts in order to achieve goals, develop knowledge and potential, and participate in society". Depending on the PISA cycle, each student is assigned 5 or 10 test scores for each discipline- reading, science and mathematics.[19]

For our main specification, we use the results from 2009 and 2018. 2009 was the last year PISA was done before the Portuguese Language reform was implemented. Although the transition period started in 2009, there is a delay in implementing the reform. Teachers and students require time to learn the new rules. The students that took the exam in 2009 had learned Portuguese before the reform was implemented. Therefore, those students did not face any transition costs. We chose 2018 since it was the first year that PISA exams occurred after the transition period. The story is different. Students who took the test in 2018 had to learn the new Portuguese rules. Consequently, we expect the effect of the reform to be fully visible in this test.

Our first step is to combine the student data for each PISA cycle with the school data in our sample. Fuchs and Wößmann (2004) argues that student family background, resources and teachers are all important factors that influence student performance in PISA exams. We exploit common data in all of our cycles to control for

[17] The age of 15 was chosen because at this age, young people in most OECD countries are near the end of compulsory education.

[18] PISA does not assess individuals who abandoned school or repeated several grades.

[19] for more details concerning how test scores are calculated see the appendix.

individual/school characteristics. The first set of variables controls for student characteristics. We have a dummy variable for gender (male and female). We also have data on mother and father education.[20] We follow the education literature and use household possession indices as a measurement of wealth. It offers a more accurate measurement of wealth than income, which can fluctuate in the short to medium term. We select 3 indices that measure: (i) family wealth, (ii) cultural possessions and (iii) home educational resources. Our second main control set refers to school characteristics. We control for school type- private vs public. Furthermore, we have data on school size and teacher-student ratio.[21]

Our Brazilian sample comprises data of around thirty thousand students. It is larger than the Portuguese sample that has data for fewer than fifteen thousand students. This reflects the fact that Brazil is a much larger country than Portugal. The mean score for both reading and mathematics is higher in Portugal compared to Brazil. If we compare individual characteristics, we find that Portuguese students are, on average wealthier. This is expected since Portugal is a developed country. In both countries, mothers are slightly better educated than the father.

Table 4.1: Descriptive Statistics: Brazil

	count	mean	sd	min	max
Male dummy	30818	.464	.498744	0	1
Female dummy	30818	.536	.498744	0	1
Age	30818	15.87	.2825037	15.42	16.33
Father education	28746	2.89	2.079501	0	6
Mother education	29868	3.08	2.053689	0	6
Wealth	30444	-1.36	.9232321	-6.9183	4.1473
Home resources	30000	-.774	1.056501	-4.5191	1.2694
Cultural	29394	-.46	.8195679	-1.9023	2.0031
School size	28100	993.01	616.5282	16	7706
Private school dummy	29240	.628	.483326	0	1
Private dependent dummy	29240	.0032832	.0572058	0	1
Public school dummy	29240	.3686389	.482444	0	1
Teacher student ratio	23741	30.25	15.61818	.274	100
Read score 1	30818	408.1306	92.39315	30.51	770.028
Read score 2	30818	408.129	92.17351	84.23	788.313
Read score 3	30818	408.2278	92.56026	59.77	771.6
Read score 4	30818	408.2482	92.50521	70.2	802.977
Read score 5	30818	408.1382	92.46413	32.04	767.548
Math score 1	30818	380.8058	80.31452	32.72	797.625
Math score 2	30818	381.3148	80.74058	44.767	769.191
Math score 3	30818	380.745	81.14389	48.93	751.522
Math score 4	30818	381.28	80.87044	6.24	737.183
Math score 5	30818	380.6804	80.67132	74.79	728.185

Notes: Table 1 shows the summary statistics for our Brazilian sample. Each student is assigned 5 test scores for maths and reading in Pisa 2009. In Pisa 2018, each student is assigned 10 test scores each for math and reading. For simplicity, we only report data on the first 5 test scores.

[20] Data uses the ISCED qualification scale

[21] See the appendix for a detailed description of all variables.

Table 4.2: Descriptive Statistics: Portugal

	count	mean	sd	min	max
Male dummy	12230	.491251	.4999439	0	1
Female dummy	12230	.508749	.4999439	0	1
Age	12230	15.75729	.2864263	15.25	16.25
Father education	11506	2.909091	1.990174	0	6
Mother education	11721	3.227284	2.024857	0	6
Wealth	11934	.2273237	.8868457	-4.3102	4.1536
Home resources	11930	.033307	.9797164	-4.4106	1.3384
cultural	11894	.0902693	.9234188	-1.7773	1.9841
school size	11726	1136.921	770.518	55	8150
private school dummy	12131	.4887478	.499894	0	1
private dependent dummy	12131	.0652048	.2468971	0	1
public school dummy	12131	.4460473	.4971011	0	1
Teacher student ratio	11496	9.048646	3.650971	1	50.6211
Read score 1	12230	489.7435	91.20899	146.11	798.628
Read score 2	12230	489.5045	91.34555	163.51	776.572
Read score 3	12230	489.3644	91.16549	134.09	799.119
Read score 4	12230	490.1019	91.18979	115.41	759.753
Read score 5	12230	489.436	90.57496	147.48	771.19
Math score 1	12230	489.7646	92.78281	153.454	804.49
Math score 2	12230	489.481	93.36438	160.62	761.785
Math score 3	12230	489.7068	92.73445	127.109	829.774
Math score 4	12230	489.0096	92.87119	180.64	793.156
Math score 5	12230	489.4549	92.79916	172	836.287

Notes: Table 2 shows the summary statistics for our Portuguese sample. Each student is assigned 5 test scores for maths and reading in Pisa 2009. In Pisa 2018, each student is assigned 10 test scores each for math and reading. For simplicity we only report data on the first 5 test scores.

4.4.3 Identification Strategy

To asses the impact of the Portuguese language agreement on student outcomes, we adopt a difference in difference framework. We first estimate the following equation:

$$\begin{aligned} score_{sedt} = \alpha + \beta_1 Read_s + \beta_2 Read_s \times PRT_s + \delta_1 T_s + \delta_2 T_s \times PRT_s \\ + \delta_3 T_s \times Read_s + \rho T_s \times Read_s \times PRT_s + E_e + A_s + \mu_{sdt} \end{aligned} \tag{4.1}$$

where our dependent variable is the score of student (s), at school (e) discipline (d) at time (t). T is a dummy variable post treatment. Read is a dummy variable for reading exam. E denotes a set of schools characteristics (school type, teacher student ratio and school size) and A is a set of controls for individual characteristics (mother education, father education, gender and family resources).

In developing our identification strategy, we assume that the Portuguese Language reform will affect mainly the reading score. Furthermore, we also believe that the treatment will be different since the language reform had a greater impact in Portugal when compared to Brazil. This means that the treatment would be felt most intensively by Portuguese students. Our main estimation controls for subject specific fixed effects (math, reading), and country specific trends in Brazil and Portugal. Our coefficient of interest is the triple interaction between reading x Portugal x time. We

are comparing changes in reading scores across countries with math scores changes, assuming that the nature of the reform only affected reading scores. We do not expect the reform to have affected math scores in any way.

We complement our main analysis by running a difference in difference for both Brazil and Portugal separately. More specifically, we estimate the following equation:

$$score_{sedt} = \alpha + \beta Read_s + \delta T_s + \rho T_s \times Read_s + E_e + A_s + \mu_{sedt} \tag{4.2}$$

4.4.4 Results

Table 3 reports the estimation results for our main triple difference specification. In column (1), we show the results of our main specification without any controls. Our main focus is the triple interaction- Reading x time x Portugal. This is represented by ρ in equation 1. We find a negative and statistically significant effect. This implies that the reform negatively affected Portuguese students. However, from the education literature, we know that socioeconomic background has a major impact on students outcome. In column (2) we control for school type. We find that compared to private schools, public school and private schools that are dependent on government resources are not negatively affected by the reform. The results are not statistically significant. In column (3), we add student characteristics control. Our main coefficient of interest remains negative and statistically significant. There is a debate in the educational literature concerning gender differences on mathematics and verbal tests.[22] We want to make sure that those gender differences do not drive our results. We show that male students performance decreases by 9 points when compared to female students. In accordance with the literature, we find that students from higher socioeconomic background perform better in standardized tests. The coefficient that measures wealth, mother education, father education and home educational resources are all positive and significant. In column (4) we add school characteristics controls. We find that school size has a small and statistically significant effect (0.015) on test scores. On the other hand teacher- student ratio has a negative and statistically significant effect. These findings are consistent with others in the literature that argue that small class sizes do not determine educational outcome.[23] To sum up, these results suggest that the reform had a small effect on Portuguese student Pisa performance. In all columns, the coefficient of interest has a magnitude of around 10 points.

[22] see Zhu (2007) for a literature review on gender differences on mathematics performance.

[23] The education literature finds mixed results concerning the impact of class size on educational outcomes. For a detailed literature review see Hattie (2005).

In table 4, we report the results obtained for the difference in difference regressions for our Portuguese student's sample. In column (1), we report our results without any controls. The results are negative and statistically significant, although of a smaller magnitude compared to those obtained in table 3. In column (2), we control for school type. Students from both public and private schools that depend on the government have a better result when compared to private school students. However, the results are not statistically significant. In column (3), we include student characteristics control. Our main coefficient of interest continues to be negative and statistically significant. In line with the literature, we find that parents education and wealth have a positive and significant results on our dependent variable - Pisa scores. Finally, in column (4), we control for school characteristics. The results obtained hold with all the control variables. The results support our previous findings that the reform had a detrimental effect on Portuguese students.

We now turn our attention to the difference in difference for our Brazilian sample. This is reported in table 5. Our coefficient of interest is positive and statistically significant in column (1), without any controls. In column (2) we control for the school type. Comparing with private schools, there is no statistically significant effect for public schools. However, students from private schools that are dependent on the government do perform much worst than those at private school. In the following columns (3) and (4), we respectively control for students socioeconomic background and school characteristics. Parents education, and wealth have a statistically significant effect on our dependent variable. Counter-intuitive, we find that the cultural index has a negative and statistically significant effect for Brazil. Our main coefficient of interest is positive and statistically significant across all our results.

As expected, Brazil, for which the reform was implying relatively minor changes, did not experience any significant disruption. However, we observe that the reform negatively affected Portuguese students performance on Pisa. This result confirms our hypothesis that Portuguese students would be negatively affected by the language reform.

Table 4.3: DDD

Dependent variable: Pisa test score	(1)	(2)	(3)	(4)
Portugal	107.549***	110.411***	69.833***	60.769***
	(4.057)	(3.963)	(4.199)	(4.725)
Reading	25.103***	24.913***	25.460***	26.096***
	(0.779)	(0.811)	(0.809)	(0.937)
2018	5.319*	1.930	5.693	13.586**
	(3.204)	(9.138)	(5.907)	(6.632)
Reading x 2018	6.405***	6.545***	7.563***	6.908***
	(1.173)	(1.196)	(1.203)	(1.339)
Reading x Portugal	-22.941***	-22.541***	-23.183***	-23.807***
	(1.560)	(1.570)	(1.569)	(1.645)
2018 x Portugal	1.393	-0.933	5.494	-3.575
	(4.794)	(4.626)	(3.813)	(4.003)
Reading x 2018 x Portugal	-10.906***	-11.130***	-12.344***	-11.731***
	(1.789)	(1.799)	(1.804)	(1.903)
Public school dummy		7.460	6.006	-1.143
		(8.926)	(5.716)	(6.521)
Private school (dependent) dummy		-2.909	-1.761	2.792
		(7.632)	(6.369)	(5.922)
Male dummy			-9.195***	-8.775***
			(0.776)	(0.838)
Cultural possessions			2.592	4.006**
			(1.837)	(1.676)
Home educational resources			12.135***	11.430***
			(0.745)	(0.760)
wealth			14.397***	12.348***
			(1.434)	(1.322)
Mother ISCED qualification			4.256***	4.206***
			(0.482)	(0.484)
Father ISCED qualification			2.160***	2.030***
			(0.299)	(0.297)
Teacher/student ratio				-0.649***
				(0.089)
school size				0.015***
				(0.002)
Constant	378.961***	375.256***	394.919***	397.232***
	(1.936)	(1.723)	(3.431)	(4.122)
Observations	86096	82742	74366	62332
R^2	0.205	0.218	0.308	0.327
Clusters	1759	1683	1678	1362

Notes: For simplicity, we report only the results obtained using the first of 5 test scores. Results are similar using alternative test scores. Standard errors in parentheses clustered at school level.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4.4: Diff in Diff - Portugal

Dependent variable: Pisa test scores	(1)	(2)	(3)	(4)
Time	6.711*	-0.886	2.347	1.028
	(3.572)	(15.069)	(7.723)	(9.575)
Treated	2.162	2.373*	2.277*	2.288*
	(1.354)	(1.347)	(1.348)	(1.355)
Did	-4.501***	-4.584***	-4.781***	-4.823***
	(1.354)	(1.347)	(1.348)	(1.355)
Public school dummy		9.716	7.581	-0.015
		(17.077)	(8.248)	(8.764)
Private school (dependent) dummy		1.937	3.284	6.183
		(13.168)	(9.429)	(8.192)
Male Dummy			-11.199***	-10.735***
			(1.930)	(1.828)
Cultural possessions			14.327***	13.878***
			(0.953)	(0.946)
Home educational resources			8.649***	8.602***
			(0.943)	(0.948)
Wealth			5.243***	5.004***
			(0.854)	(0.880)
Mother ISCED qualification			6.483***	6.326***
			(0.380)	(0.408)
Father ISCED qualification			3.688***	3.371***
			(0.787)	(0.789)
Teacher/student ratio				-0.438
				(0.423)
School size				0.017***
				(0.004)
Constant	486.509***	485.256***	458.487***	448.087***
	(3.572)	(3.755)	(3.302)	(6.512)
Observations	24460	24262	22558	21274
R^2	0.001	0.002	0.133	0.151
Clusters	215	214	214	211

Notes: For simplicity, we report only the results obtained using the first of 5 test scores. Results are similar using alternative test scores. Standard errors in parentheses clustered at school level.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

Table 4.5: Diff in Diff - Brazil

Dependent variable: Pisa test scores	(1)	(2)	(3)	(4)
Time	5.319*	1.912	6.344	14.134*
	(3.204)	(10.428)	(6.887)	(7.987)
Treated	25.103***	24.913***	25.460***	26.096***
	(0.779)	(0.811)	(0.809)	(0.937)
Did	6.405***	6.545***	7.563***	6.908***
	(1.173)	(1.196)	(1.203)	(1.339)
Public school dummy		7.292	5.819	-1.844
		(10.436)	(6.873)	(8.070)
Private school (dependent) dummy		-32.578***	-21.989***	-15.001***
		(2.029)	(3.315)	(3.489)
Male dummy			-8.527***	-8.039***
			(0.948)	(1.064)
Cultural possessions			-3.730***	-2.761***
			(0.750)	(0.851)
Home educational resources			13.372***	12.810***
			(0.616)	(0.680)
Wealth			18.263***	16.246***
			(1.184)	(1.289)
Mother ISCED qualification			2.925***	2.726***
			(0.325)	(0.365)
Father ISCED qualification			1.112***	0.972***
			(0.318)	(0.358)
Teacher/student ratio				-0.621***
				(0.091)
School size				0.011***
				(0.003)
Constant	378.961***	375.421***	404.911***	410.562***
	(1.936)	(1.706)	(2.340)	(4.279)
Observations	61636	58480	51808	41058
R^2	0.027	0.030	0.156	0.168
Clusters	1544	1469	1464	1151

Notes: For simplicity, we report only the results obtained using the first of 5 test scores. Results are similar using alternative test scores. Standard errors in parentheses clustered at school level.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$

4.4.5 Robustness Tests

The previous results rely on the assumption that trends across the disciplines and the countries considered were similar absent the Portuguese language orthographic reform. In order to test more formally this assumption, and following the extensive diff in diff literature, we gather data on three previous PISA surveys 2000, 2003, and 2006. PISA 2000 used less advanced methods than the more recent PISA studies. Nonetheless, we include it to show the robustness of the results. We then estimate our main model (1) using three alternative specifications to check for the existence of differential pre-trends. Given that the reform would only affect students who did their PISA exam after 2009, one should expect that the coefficient of interest, the triple interaction - Reading x Time x Portugal not to be statistically significant.

The results of these exercises are reported in Table 6. In Panel A, we run the triple difference in difference regression using all the previous PISA years available- 2000, 2003, 2006 and 2009. Our coefficient of interest remains insignificant. In Panel B, we run the regression using PISA data for 2003, 2006 and 2009. The triple interaction: Reading x Time x Portugal remains insignificant.

Last, in Panel C, we run the regression using the last two PISA scores available before the reform (2006 & 2009). In column (1), the coefficient of interest is negative and statistically significant. Nevertheless, this should not be a problem since we know that socioeconomic background significantly contributes to exam results from the educational literature. In the following columns, we control for school type, individual and school characteristics. The coefficient of interest remains negative, however not significant. Overall, the results in our falsification test increase our confidence that the Portuguese language reform had a negative impact on Portuguese students.

Table 4.6: Falsification Exercises- DDD

	(1)	(2)	(3)	(4)
Panel A				
Reading x time x Portugal	3.275	1.207	0.427	2.708
	(2.125)	(2.338)	(2.346)	(2.978)
School type		✓	✓	✓
Individual controls			✓	✓
School controls				✓
Panel B				
Reading x time x Portugal	0.275	1.207	0.427	-4.397
	(2.300)	(2.338)	(2.346)	(3.202)
School type		✓	✓	✓
Individual controls			✓	✓
School controls				✓
Panel C				
Reading x time x Portugal	-5.371*	-3.805	-4.666	-4.397
	(2.933)	(2.933)	(2.937)	(3.202)
School type		✓	✓	✓
Individual controls			✓	✓
School controls				✓

Notes: The dependent variable in all regressions is Pisa Test scores. For simplicity, we only report the results obtained using the first of five test scores. Panel A reports the results for the years 2000, 2003, 2006 2009. Panel B reports the results for the years 2003, 2006 and 2009. Panel C reports the results for the years 2006-2009. Standard errors clustered at the school level are reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

4.5 Conclusion

This paper contributes to the economics literature by investigating the short term impact that the Portuguese language reform has had on students PISA outcomes in Portugal and Brazil. Although language reforms have occurred throughout history and have been extensively researched in other fields, there have been few attempts to explore the cost of those reforms to society and the economy.

We adopt a difference in difference framework by exploiting the fact that the reform affected much more Portuguese students when compared to Brazil. Our first strategy was to use a triple difference in difference model to measure the impact of the reform on Portuguese students. Our second strategy was to run a simple diff in diff for Portugal and Brazil separately. The results obtained support our hypothesis. We argue that the reform has had a detrimental impact on Portuguese students Pisa test scores.

Supporters of the Portuguese language reform have argued about its many benefits-integrated market, cultural exchanges, and the Portuguese language's status internationally. This paper shed light on the short term costs of the reform to human capital.

We see two future avenues for further research in the field. First, we need to better understand the long term costs and benefits of the reform on Portuguese-speaking countries. Research should not be restricted to only Portugal and Brazil. This would give a better picture of the overall impact of the reform. Another avenue for research is to understand how different language reforms affect different countries. One suggestion is to look into whether language reforms that face public opposition have a greater detrimental impact on students than those facing less public hostility.

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Appendices

Appendix A

Chapter 2

List of Countries

Albania, Algeria, Azerbaijan, Argentina, Australia, Austria, Bangladesh, Armenia, Belgium Bosnia Herzegovina, Brazil, Bulgaria, Belarus, Canada, Chile, China, Colombia, Croatia Cyprus, Czech Republic, Denmark, Dominican Republic, Ecuador, El Salvador, Ethiopia, Estonia, Finland, France, Georgia, Germany, Ghana, Greece, Guatemala Hungary, Iceland, India, Indonesia, Iran, Iraq, Ireland, Israel, Italy, Japan, Kazakhstan, Jordan, South Korea, Kuwait, Kyrgyzstan, Lebanon Latvia, Libya, Lithuania, Luxembourg, Malaysia, Mali, Malta, Mexico Moldova, Montenegro, Morocco, Netherlands, New Zealand, Nigeria, Norway Pakistan, Peru, Philippines, Poland, Portugal, Qatar, Romania, Russia Rwanda, Saudi Arabia, Serbia, Singapore, Slovakia, Vietnam, Slovenia South Africa, Zimbabwe, Spain, Sweden, Switzerland Thailand, Trinidad and Tobago, Tunisia, Turkey, Uganda, Ukraine, North Macedonia, Egypt United Kingdom, Tanzania, United States , Burkina Faso, Uruguay Uzbekistan, Venezuela, Yemen, Zambia

Variables Description

- **Liberal democracy data**: Varieties of Democracy (V-Dem) is a new data-set that measures democracy. It provides a multidimensional score that reflects the complexity of democracy as a system of rule that goes beyond the simple presence of elections.
- **Polity data**: Democratic quality measurement that scores countries based on their democratic characteristics. I use constraint on the executive as an alternative measurement of democratisation. Source: Center for Systemic Peace.
- **World Value Survey/ European Value Survey**: Generalized trust: Generalized trust: Respondents are given 2 options: (2) Do not trust and (1) Trust. I change the order so that higher value means higher trust. Missing data is dropped.
- **GDP p/ capita**: Country GDP in US dollars. Source: World Bank.
- **Education**: Expected years of schooling in formal education. Source: World Bank.
- **Fractionalization**: Measurement of ethno-linguistic fractionalization. Source: Alesina et al (2003).
- **Muslim dummy**: Muslims as a percentage of population. Source: La Porta et al. (1999) and World Bank.
- **Urban population**: Percentage of the population living in urban centres. Source: World Bank.
- **Common law dummy**: Identifies the legal origin of the Company Law or Commercial code of each country. There are five different classifications: English Common Law, French Commercial Code, Socialist/Communist Laws, German Commercial Code Scandinavian Commercial Code. Source: La Porta et al. (1999).
- **World region data**: Regional classification of countries. Source: World Bank.
- **Colonial data**: Classification of the former colonial ruler of the country. Each country that has been colonized since 1700 is included. Source: The Quality of Government (QoG) Institute- Department of Political Science at the University of Gothenburg.
- **Domestic/ International conflict data**: Number of domestic/ international armed conflicts per country in a given year. Internal armed conflict

occurs between the government of a state and one or more internal opposition group(s) without intervention from other states. Source: Uppsala Conflict Data Program (UCDP)- Department of Peace and Conflict Research, Uppsala University.

- **Oil data**: Oil rents are the difference between the value of crude oil production at world prices and total costs of production. Source: Quality of Government Institute (Department of Political Science at the University of Gothenburg).

Appendix B

Chapter 3

Variables Description

1872 Census

Slave ratio: number of slaves divided by total population at each municipality

Latino Barometro

Generalized trust: Respondents are given 2 options: (1) Do not trust and (2) Trust. I change the order so that higher value means higher trust. Missing information is dropped.

Trust Government: Respondents are given 4 options. (1) No confidence, (2) little confidence, (3) Some confidence and (4) full confidence. I change the order so that higher value means higher trust. Missing information is dropped.

Age: Age of participants in the Latino barometro survey.

Gender: Dummy variable for male or female.

Education: Respondents educational level, ranging from 1 to 7. A higher value means higher educational level.

Subjective income: Respondents income at the end of the month, ranging from 1 to 4. 1 means income does not reach the end of the month. A value of 4 means the respondent has saved part of the income.

Current economic situation: Respondent view on the current economic situation of the country. Ranging from 1 (very bad) to 5(very good).

Municipality

Gini: inequality measurement at the municipality level.

Formal employment: Percentage of the population which is in formal employment.

HDIM: Human development index at the municipality

Expected years education: The amount of year in education expected for a child.

Income p/ capita: Income per capita at the municiaplity in Brazilian Reais.

Poverty rate: Percentage of the population living in poverty

Geographic

Distance equator: distance from the municipality centre to the equator (absolute value). Data obtained from the National Institute of Geology (INGEO)

Distance to the coast (KM): distance from municipality centre to the coast. Data calculated by the Federal University of Rio de Janeiro.

Institutional data

Instituional quality: A measure of institutional quality at the municipality, ranging from 1 to 6. Calculated based on urban property tax data.

Foundation year: Year that municipality was founded.

Results excluding bad controls

Table B.1: Robustness- Effect of Slavery on Generalized Trust

Dependent variable: Generalized Trust	(1)	(2)	(3)
Slave ratio	0.636	0.763	0.373
	(0.675)	(0.693)	(0.705)
Individual controls		✓	✓
Geographic controls			✓
Year FE	✓	✓	✓

Notes: This table shows results excluding municipality and institutional controls. Year FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

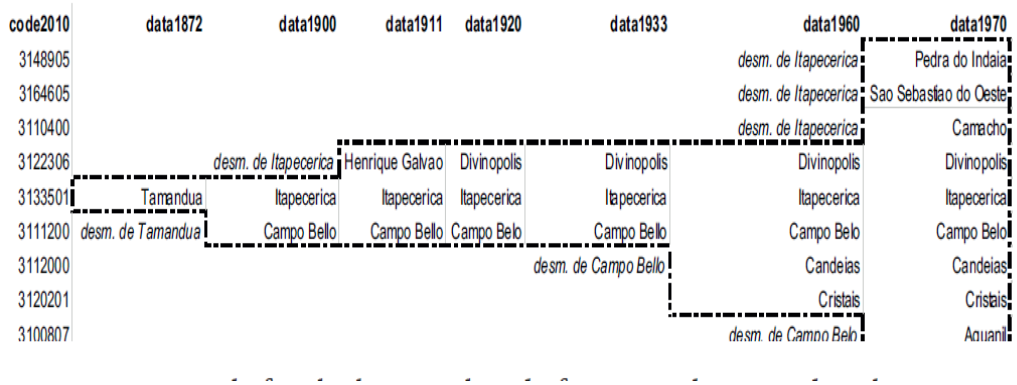
Table B.2: Robustness- Effect of Slavery on Trust Government

Dependent variable: Generalized Trust	(1)	(2)	(3)
Slave ratio	-0.213	-0.144	0.060
	(0.181)	(0.144)	(0.132)
Individual controls		✓	✓
Geographic controls			✓
Year FE	✓	✓	✓

Notes: This table shows results excluding municipality and institutional controls. Year FE = fixed effect. Standard errors clustered at the MCA level reported in parentheses.* $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. See appendix for full set of controls.

Slave ratio data

The figure below shows how Minimum Comparable Areas were constructed (Ehrl, 2017). In the example above, the municipality of Tamandua was subdivided into several new municipalities during the 20th century. I calculated the slave ratio for Tamandua in 1872 and assigned the same slave ratio for all municipalities that were subsequently created. In many cases, what occurred was that as cities grew, the government divided them into several new municipalities.



code2010	data1872	data1900	data1911	data1920	data1933	data1960	data1970
3148905						*desm. de Itapecerica*	Pedra do Indaia
3164605						*desm. de Itapecerica*	Sao Sebastiao do Oeste
3110400						*desm. de Itapecerica*	Camacho
3122306		*desm. de Itapecerica*	Henrique Galvao	Divinopolis	Divinopolis	Divinopolis	Divinopolis
3133501	Tamandua	Itapecerica	Itapecerica	Itapecerica	Itapecerica	Itapecerica	Itapecerica
3111200	*desm. de Tamandua*	Campo Bello	Campo Bello	Campo Belo	Campo Bello	Campo Belo	Campo Belo
3112000					*desm. de Campo Bello*	Candeias	Candeias
3120201						Cristais	Cristais
3100807						*desm. de Campo Belo*	Aguanil

Source: Ehrl (2017)

Appendix C

Chapter 4

Variables Description (PISA data)

Gender: Dummy variable for male or female

Father education: Student father education level according to the International Standard Classification of Education (ISCED) qualification scale. Values range from 0 (pre primary education) to 6 (Second stage of tertiary education).

Mother education: Student mother education level according to ISCED. See father education for more details.

Wealth: Pisa attributes a wealth score for each student. The score is calculated based on students questionnaires. For instance, a student is awarded a higher score if he has a room of his own, access to the internet, tv, computer, among others. See Pisa technical report for each survey year for a full description of how the wealth score is calculated. Home resources: Pisa attributes a score for each student based on home resources. For instance, a student is awarded a higher score if he has access to a quiet place to study and a computer with internet access. For a full description of how the home resources score is calculated see Pisa technical report for each survey year.

Cultural possessions: Pisa attributes a score for each student based on their access to cultural resources. For instance, a student is awarded a higher score if he has access to classical literature, books of poetry, education software, among others. For a full description of how the home resources score is calculated see Pisa technical report for each survey year.

School size: The number of students in each school.

Private school: Dummy variable for private school.

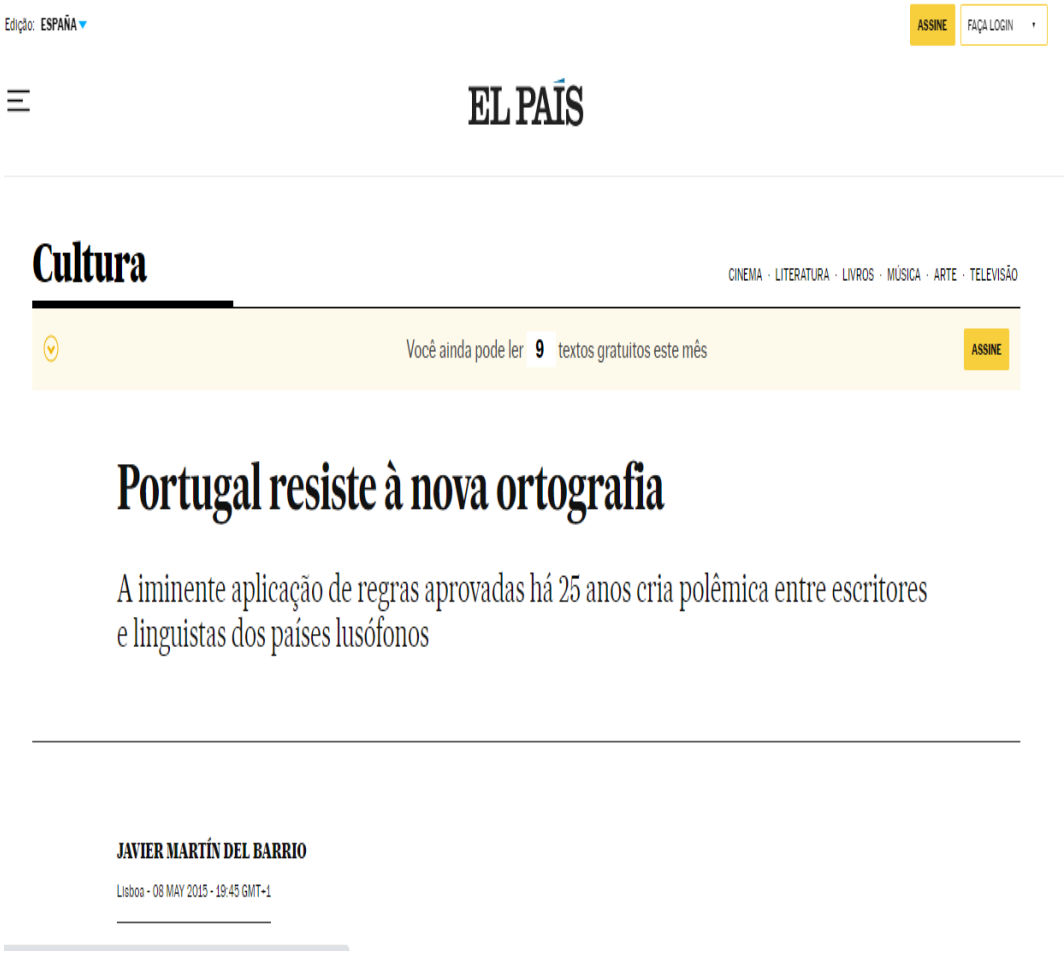
Private dependent school: Dummy variable for private schools that receive government support.

Public school: Dummy variable for government owned school.

Teacher student ratio: The number of students who attend a school divided by the number of teachers in the institution

Reading/ Mathematics test score: Individual students are assigned scores known as plausible values. Each plausible score is a random value drawn from the distribution of the scores. The scores are calculated through multiple imputations based on students answers to the question and background questionnaire. Depending on the year of the exam, students are assigned 5 or 10 scores for each subject. Theoretically, there is no minimum or maximum score. Pisa states that most students who participate in the exams get a score between 400 and 600 points. However, few students get scores of over 800. For a full description of how scores are calculated, see Pisa technical report for each survey year.

Newspaper headlines



Notes: El País- May 2015

Notes: Diario de Noticias- October 2020

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LIVROS

Petição para desvincular Portugal do acordo ortográfico entregue no Parlamento

No dia em que a Academia de Ciência de Lisboa reúne, na sua sede, profissionais da escrita, é entregue oficialmente na Assembleia da República uma petição contra o acordo ortográfico.

Nuno Pacheco

8 de Março de 2017, 15:19

Receber alertas

Notes: Público- March 2017

BRASIL • EDUCAÇÃO

Parlamento de Portugal analisará pedido contra acordo ortográfico

Petição assinada por 6.212 pessoas pede que o país seja desvinculado do tratado

AGÊNCIA BRASIL

18/07/2013 - 14:01 / Atualizado em 18/07/2013 - 14:04

Notes: Agencia Brasil- March 2017