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Masters in Economic Development

Social Capability and Resilience to Economic Shrinking: An Empirical Investigation for Latin America c. 1970-2016

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Abstract: Long term economic growth leading to development is as much about growing as avoiding spells of considerable negative growth, or shrinking. However, much more attention has been given to understand what makes countries achieve high growth rates than to avoid shrinking. Here we explore empirically a novel approach which proposes that five interrelated dimensions of social capability (*inclusion, transformation, social stability, and state autonomy* and *accountability*) could help understand resilience to economic shrinking. Making use of public data and a variety of empirical methods we delve into this relation for the Latin American context since 1970. In particular we look at the duration of periods of economic crisis and the performance under international stress. We find mixed evidence for our theoretical framework. While we are able to support *State autonomy* and *accountability*, and *social stability* having a positive relation with shrinking resilience, the same cannot be said about *inclusion* and *transformation*. Further research is clearly required to extend the research beyond the region, and to explore the interrelation between the different dimensions of social capability.

Key words: Shrinking, crisis, resilience, catch-up, social capability, survival analysis, Latin America.

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1. Introduction

For Latin America, the last century could both be appreciated as a success or a failure. On the one hand, Latin America has been able to feed its growing population and increase the living standards, lifting millions of people out of poverty in the way (Bertola, 2016). The region has grown at the world average during the last century, and most of the countries are today in the middle-income category. On the other hand, the continent has experienced a clear divergence with respect to the developed countries, failing to diversify its economies on the way and falling behind the East Asian countries like Korea and Taiwan which were much poorer only 60 years ago, and sit now watching how the likes of China, India and some Southeast Asian countries, showing a dynamism long ago lost in the region, are posited to pull ahead in the mid-term.

The inability of Latin America to catch-up is much less about lack of growth than about the incapacity to sustain it for relatively long periods of time. However, this does not seem to be unique of Latin America. While achieving sporadic growth spurts and even sustaining high growth rates for brief periods seem to be relatively trivial as almost every country has experienced it, sustaining even moderately high growth rates for long periods – say more than 15 years – is something almost exclusively reserved for the small club of rich countries. Borrowing – and twisting – the growth regimes taxonomy of Pritchett et al. (2000), for most countries GDP per capita in the long term does not look just like a "continuous uphill", but rather more like a succession of short hills, and plateaus in the best cases, and a random combination mountains, valleys, plateaus and even cliffs in the worst ones.

This realization carries at least two essential and connected consequences. The first is that focusing on average growth rates for long periods hides very different experiences behind one number. The "topology of growth" of two countries growing at the same rate for a long period could be diametrically different, and to equate those two experiences highly misleading. The second is that equally, or perhaps even more, important than understanding the determinants of long-term economic growth it is to explore what is behind regime transitions, their prevalence, and duration. In particular, for the enterprise of catching-up, one would concentrate over what sets episodes of miracle growth (Hausmann, Pritchett & Rodrik, 2005) and how to avoid crises or output collapses (Hausmann, Rodriguez & Wagner, 2006).

In this regard, the seminal contribution of Easterly et al. (1993) showed that the main difference between poor and rich countries lies in that poor countries grow less frequently and experience recurring episodes of negative growth. In contrasts, rich countries grow at lower rates in periods of positive growth but are able to limit, and when they happen, they tend to be short (Broadberry & Wallis, 2016). Furthermore,

recently Broadberry and Wallis (2017) showed how the improvement of economic performance, in the long run, is accountable to the decline of the frequency and rate of economic shrinking, instead of to an increase on the growth rate. When the long run economic performance improves, the short run growth rate declines, but the frequency of positive growth increases.

Moreover, despite the generalized narrative over crisis recovery, evidence seems to show that output collapses tend to have a lasting effect on the economy. Cerra and Saxena (2008) found that output losses are highly persistent: "less than one percentage point of the deepest output loss is regained by the end of ten years following a crisis." A partial rebound is only observed for civil wars. Moreover, Blyde, Daude, and Fernandez-Arias (2010) found that output collapses during the 1980 crisis meant more than a lost decade for Latin America and Sub-Saharan Africa, as there is strong evidence of persistent productivity: "the evidence suggests that there is irreversible productivity damage" (Blyde, Daude & Fernandez-Arias, 2010, p.383).

Despite all this, the underlying factors that make some countries more prone than others to economic shrinking are yet unknown (Andersson, 2018), although the literature relies on the usual suspects. For Broadberry and Wallis (2017) the proximate factors behind this evolution on the decline of economic shrinking are structural transformation, technological change, demographic transformation, and the incidence of warfare, while the ultimate factor is institutional change. Analyzing full economic crises Hausmann et al. (2006) found that that the onset of crises often coincides with a number of events like wars, export collapses, breaks in capital flows and inflation spurts, but the duration of any given crisis is rather difficult to predict. For Jones and Olken (2008) growth decelerations are associated with declines in investment, increasing inflation, and internal conflict. Finally, Rodrik (1999) argued that "the effect of external shocks on growth is larger the greater the latent social conflicts in an economy and the weaker its institutions of conflict management" (Rodrik, 1999, p.386).

Andersson (2018) recently suggested that it could be worth searching for the ultimate causes of economic shrinking in social capability. Because this concept has historically suffered from the lack of a clear definition, five, and a set of indicators that could proxy them are proposed. The five dimensions are *inclusion, transformation, state accountability, state autonomy*, and *social stability*. In short, *inclusion* stands for the broad capacity to participate in the market, *transformation* relates to the capacity to exploit modern technology to achieve structural transformation, *autonomy* and *accountability* of the State stand for the ability to keep vested interests at bay and the quality of government and the provision of public good respectively. Finally, *social stability* goes beyond the obvious connotation to center on the arrangements of conflict resolution (Rodrik, 1999).

Consequently, in this paper, we investigate whether social capability could help explain why some countries show more resilience to economic shrinking than others. In particular, we try to answer the following research questions, for Latin America:

> ***How could social capability explain episodes of economic shrinking, their occurrence, duration, depth, and recovery?***
>
> ***Which aspects of social capability seem to have been more relevant to avoid shrinking and/or limit its extent?***

We restrict the study to Latin America and the Caribbean (LAC or Latin America from now on) between 1970 and the present. This decision is based on four main reasons. First, it seems reasonable that this exploration must be made in a "developing context" where countries actually experience economic shrinking on a regular basis. Second, some of the social capability dimensions have only recently begun to be consistently measured worldwide and even more recently for the developing world. In this context, the fact that Latin America region has relatively good information for most countries in terms of quality and coverage compared to the rest of the developing world. However, as we will discuss later, data still represents one of our most significant limitations. Third, given the exploratory nature of the task ahead, the relative institutional homogeneity offers the potential of counteracting potential omitted variable bias. And finally, despite the relative institutional homogeneity, the region presents enough variability in terms of development level and social capabilities stock. The study period is an exogenous restriction related to the information available to characterize sufficient episodes both in terms of economic performance, shrinking, and social capability.

During this period, Latin American countries have experienced economic shrinking in more than 25% of the years, averaging 3.3% of negative growth in those years. Moreover, Latin American countries have spent more than 60% of the time in "crises" – either falling into or recovering from one. One hundred three episodes of crisis are identified in the period, almost 3 per country with an average duration of nearly 8 years, and an intensity of 10% at the lowest point (respect to the initial GDP). On the other hand, the continent as a whole has experienced three episodes of overall shrinking coinciding with the three major crises since 1960, namely the Debt Crisis of the early 1980s, the Asian Crisis of the late 1990s, and the Great Financial Crisis of the late 2000s.

The method of study is quantitative and fundamentally explorative and empirical. We make use of public data to characterize growth trajectories, identify shrinking periods and crises, and to also characterize the different dimensions of social capability.

Methodologically, we follow two distinct approaches. In the first one, we identify episodes of crisis to then explore how social capability can explain the duration and intensity. In the second one, we make use of the "natural experiments" of the external crises to explore how social capability could influence countries falling (or not) into a

crisis in a context of international distress. We also explore the extent or intensity with different measures.

To explore the duration of crises, we use survival models, which basically estimate the "probability of an event occurring at a certain time conditional to the event not having occurred before" (Bluhm, de Crombrugghe & Szirmai, 2013, p.29). For this, we estimate semiparametric Cox proportional hazards models.

When exploring international crises, we use standard OLS regressions for different measures of the shrinking intensity. We also utilize a first-difference analysis in order to understand what could explain the much better response during the last international crisis, the great financial crisis (GFC from here on), with respect of the previous two, the debt crisis of the 1980s and the Asian crisis of the late 1990s (DC and AC respectively from here on).

Our main results offer mixed support to our theoretical framework (Andersson, 2018). The relation between social capability and the different aspects of economic shrinking proved to be a complex one, as we find that most aspects of social capability have mixed effects over durations, intensities, and the response to periods of international turmoil. First, we found that, despite the evidence being inconclusive, *inclusion* seems to have a rather negative relation with resilience to economic shrinking. Second, again, despite some mixed results, our evidence does not support transformation being positively related to resilience to economic shrinking. Third, although not conclusively, the evidence points toward *autonomy* being positively related to resilience to shrinking. Fourth, *accountability* showed a positive effect on both analyses; thus it seems safe to say that this dimension is positively related with resilience to economic shrinking. And finally, our results on measures of social stability, both in terms of latent stability and institutional capacity, largely point towards the same direction than state accountability: strong evidence of being positively related to resilience to economic shrinking.

We believe that our main contribution is to provide empirical evidence for the relation between social capability and different aspects of economic shrinking. However, this research has left a lot unanswered and what should follow now is delving into the evidence presented here and pursue more fine-grained explorations not only of the relations, but also the mechanisms behind them.

The rest of this paper is organized as follows. In Chapter 2 we present the theory by, in the first place, discussing the previous research developed related to our topic and to which this paper intends to be a contribution, and in the second place, presenting the theoretical framework of shrinking and social capability. In Chapter 3, we present and discuss the data and research methods. First, we detail the data collected to characterize episodes of shrinking and crisis, and the indicators used to characterize social capability. Then, we present and discuss the different empirical strategies, in particular, how each contributes to answering or research questions. In Chapter 4, we present the empirical research results. Here we start with an overview of the evolution of growth, shrinking,

and social capability on the region, and then move to present the results of our empirical research strategies, including various robustness analyses. Finally, we discuss the results and its implication in connection to our framework and the existing literature. We wrap it all up in Chapter 5 and also propose potential avenues for future research.

2. Theory

This Chapter has two primary purposes. First, we identify and discuss the literature strands that support our research and to which we aim to contribute. Then, we present the specific theoretical approach that guides our investigation of shrinking and social capability.

2.1. Previous Research

This paper is connected – and intends to contribute – to, at least, four literature strands. First, it is closely linked to the literature on catch-up growth and convergence, since resilience to economic shrinking would explain a large part of how successful the convergence efforts of developing countries are. Second, our research is also related to the "growth topology" literature which explores the "episodic" nature of growth, studying both the occurrence and the determinants of growth accelerations, decelerations, crises, and stagnation periods and the transition between them. This strand emerged as a response or a critique to the lack of nuance and oversimplification of the growth regressions literature strand which is found guilty of hiding relevant differences between countries under a single scalar measure of average growth in a given period (often rather long). Here it is particularly close to the sub-strand of literature that studies shrinking, crises, and output collapses and their determinants. Third, the paper is a contribution to the literature on capabilities, in particular, social capability, which in turn, it is highly related to the research on catch-up and convergence. As we shall see, social capability is a term coined to refer to the "qualities" that make a backward country likely to catch-up or not. Finally, the paper contributes to the discussion on why Latin America has not been able to develop. On the one hand, it is at least surprising that not even one country has achieved development by now considering the relatively high-income levels of many countries in the region more than a century ago. On the other hand, only a handful of countries have been able to catch up during this century; all of them located either in Europe or Asia.

2.1.1. Growth Topology

This strand of literature deals with changes in growth patterns or "growth regimes." Some papers center upon the transition between different regimes while others on one specific phenomenon like high growth spells, stagnation spells, growth collapses and

shrinking, investigation both the occurrence and the determinants of the subject of study.

The seminal contribution here was made by Easterly et al. (1993) by showing that while growth rates are not very persistent (in terms of within-country growth variation), the country characteristics usually thought to be the determinants of growth are highly persistent. Furthermore, they found that external shocks (in particular in terms of trade) explain much of the variance in growth rates, and that, moreover, shocks indirectly influence through changes in policy. Thus, the low persistence of shocks would explain the low persistence of growth rates.

Dani Rodrik (1999) made use of the natural experiment of the 1970s as a highly turbulent period to contrast growth before and after 1975 and found that the effect of external shocks on growth is largely mediated by the latent social conflicts and the institutions for conflict management available in each country. By latent social conflicts he referred to social cleavages around wealth, ethnicity, geographical regions, and religion, while institutions of conflict management would be democratic institutions, an effective judiciary, non-corrupt bureaucracy, and modes of social insurance.

Moreover, Claudio Raddatz (2007) showed that although external shocks have an economically meaningful impact on low-income countries per-capita GDP (compared to their own performance), they can account for a rather small proportion of the overall variance (11% in the long run. The remaining 89% is accounted for by factors associated with endogenous shocks.

Hausmann et al. (2005; 2006) looked for growth acceleration and collapses between 1950 and 2000. On the accelerations side, they point out that those are quite frequent but highly unpredictable. Nevertheless, they are correlated with increases in investment and trade, exchange rate depreciations, and political regimes changes. On the side of the growth collapses, they studied crises understood as the full period between an initial GDP downturn and its recovery to the level precisely before the decline began. They found that the onset of crises often coincides with a number of events like wars, export collapses, breaks in capital flows and inflation spurts, but the duration of any given crisis is rather difficult to predict. However, they found that the density of a country's production space is an important predictor of crisis recovery. A country with a denser production space has more room to adapt to external shocks. Production factors can move more easily to less impacted sectors if they are technologically closer, thus providing more flexibility to the economy as a whole. This vision is supported by the research on “related variety” and economic resilience at the regional level (Boschma, 2014, 2016).

Jones and Olken (2008) studied both accelerations and decelerations and found them to be highly asymmetric. Accelerations are associated with trade and not so much with investment. Decelerations are related to declines in investment, increasing inflation, and internal conflict. Moreover, all developing countries have experienced growth spells

higher than the US "best" and others lower than the US "worst." Only very rich countries are able to avoid that pattern.

Berg et al. (2012) explored the determinants of the length of growth spells and found that "external shocks and macroeconomic volatility are negatively associated with the length of the growth spell, while good political institutions predict longer growth spells" (Berg, Ostry & Zettelmeyer, 2012, p.150). Moreover, trade liberalization is associated with longer growth spells, especially if combined with competitive exchange rates, and current account surpluses. Finally, more and more sophisticated manufacture seems to make spells longer. The same is true for more the level of equality displayed by society.

Building from Pritchett (2000) Jerzmanowski (2006) identifies four growth regimes (stable growth, stagnation, crisis, and miracle growth) and showed that although most countries visit all of them, what determines the long-run growth path of any country is the probability of the country to transition between them. Those probabilities are determined by the quality of institutions: better institutions lead to more persistence of hills and mountains; weak institutions lead to more persistence of plateaus and plains. Countries with bad institutions are capable of growing at high rates but unable to sustain it. Later, Jerzmanowski (2011) found that besides institutions, macro policies such as inflation, trade openness, government size, and real exchange rate valuation also affect the pattern of changes in growth regimes. Unlike institutions, policies tend to have mixed effects. For instance, while openness to trade seems to be detrimental for stable growth, makes crises more likely, but also makes miracle growth more likely.

Moreover, the interaction between institutions and policies plays a vital role. For instance, government size lowers growth when combined with sound institutions and increases it when in the presence of weak institutions. Special mention for democracy as it has been showed to contribute to make growth performance more stable (Mobarak, 2005) and lessen the propensity to experience episodes of significant growth reversals (Cuberes & Jerzmanowski, 2009).

Beyond fundamentals (endowment of physical and human capital, labor, NNRR, and institutions), idiosyncratic elements in specialization patterns are important determinants to understand the different growth performances: Different specialization patterns lead to radically different economic performances in otherwise similar countries (Hausmann, Hwang & Rodrik, 2007).

Narrowing down to or subject study, namely economic shrinking and output collapses, Broadberry and Wallis (2017) showed how the improvement of economic performance, in the long run, is accountable to the decline of the frequency and rate of economic shrinking, rather to an increase on the growth rate. Moreover, when the long-run economic performance improves, the short run growth rate declines, but the frequency of growth increases. For them, the proximate factors behind this evolution on the decline of economic shrinking are structural transformation, technological change,

demographic transformation, and the incidence of warfare, while the ultimate factor is institutional change.

Contrary to what is usually assumed, the effects of output collapses are highly persistent. Cerra and Saxena (2008) documented how output behaved following financial and political crises and found that a very minor fraction of output loss is regained even ten years after the crisis ends. A partial rebound was only observed for civil wars. Moreover, Blyde at al. (2010) found that output collapses during the 1980 crisis meant more than a lost decade for Latin America and Sub-Saharan Africa, as there is strong evidence of persistent productivity damage, while "permanent effects on productivity entail lower GDP and lower long-term GDP growth" (Blyde, Daude & Fernández-Arias, 2010, p.383). And even when the effects were temporary, the costs associated are substantial for the economy.

Recently some have built upon the growth collapses of Hausmann et al. (2006). Reddy and Minoiu (2009) studied the patterns and causes of income stagnation. They define a stagnation period as beginning with income per capita falling below the level of the two previous years while being higher than during the next four years. A stagnation period ends when income per capita grow at least 1% for two consecutive years. They found that a large number of countries have suffered long and sometimes intense periods of stagnation, which has translated into the loss of potential income and therefore, a loss of welfare of the population. Stagnating countries are mainly concentrated both in Sub-Saharan Africa and Latin America, and the main determinants of stagnation are conflicts and a pattern of specialization dependent on primary commodity exports.

Bluhm et al. (2016) also looked at stagnation periods, but their definition of such spell is quite similar to the one of Hausmann et al. (2006). However, they study separately the fall period and the recovery period with panel data. They identify some factors that could explain the incidence and persistence of stagnation spells. Regime changes have the largest effect of incidence, and higher inflation increases the chances to remain in stagnation. Trade openness protects against stagnation but does not help to a faster recovery.

Finally, Bluhm et al. (2013) used survival analysis to explore the role of institutions on the duration of periods of crisis. They find robust evidence for institutional underdevelopment before the slumps. Weak institutions are related to more prolonged crises, in particular in the presence of ethnic cleavages. Moreover, they find a clear trend of institutional reforms during crises and immediately after them.

2.1.2. Catch-up Growth and Social Capability

The concept of social capability has been around for a rather long time. It was coined by Ohkawa and Rosovsky (1973), but it was really made known by Moses Abramovitz (1986) when arguing that the concept of backwardness advantage of Alexander Gershenkron (1962) needed qualification. To make use of this advantage and achieve rapid economic growth, a country needs not only to be technologically backward but also socially advanced. Only backward but socially capable societies could catch up.

However, the literature on social capability has suffered from the lack of a consistent definition and the difficulty to measure and empirically explore some of the predictions. In this regard, scholars have taken two main avenues to explore the role of social capability on growth and development. On the one hand, one finds what could be called the "long-term conception of social capability" which understands social capability as traits that are developed and molded over extensively long periods (hundreds or even thousands of years). As such, this theoretical strand explores the relationship between some of the measures regarding early state formation, the agricultural revolution, and urbanization, and current economic performance.

A major representative of this current is Louis Putterman who has authored or co-authored a myriad of papers on the subject (Chanda & Putterman, 2007; Iliev & Putterman, 2007; Putterman, 2000, 2013; Putterman & Weil, 2008). As a whole, this line of inquiry argues that the countries that "had greater potential for rapid economic growth in the late 20th century had largely been determined as early as 1500" (Putterman, 2013, p.352). Indeed, Chanda and Putterman (2007) show that the reversal of fortune observed by Acemoglu et al. (Acemoglu, Johnson & Robinson, 2001, 2002) is limited to the era of European expansion. After 1960 ancient early starters such as China and India are experiencing a rapid catching up, the disadvantages of those areas that were behind in 1500 are resurfacing and the countries there are catching up very slowly if at all.

Moreover, Iliev and Putterman (2007) studied the ex-communist states and found that historical measures of social capability help explain the economic performance both during the communist (1970-1990) era and the transition period (1990-2002). Early states tend to perform better in both periods. As measures of early development, the authors use a variable of state history (constructed by themselves) and population density, and ethnic fractionalization (according to the associated with late development).

Spolaore and Wacziarg (2013, p.362) found that "technology and productivity tend to be highly persistent, and "Neolithic" advantages continue to have positive effects on income per capita". Countries that were at the technological frontier in 1000bc are still at the frontier today (Spolaore & Wacziarg, 2013). However, persistence seems more associated with people than locations. In fact, Putterman and Weil (2008) constructed a matrix to account for international migration since 1500 and found that the origins of a

country's population matters for economic development. They found that countries which ancestors came from places with early development of agriculture and centralized political structures translate into a higher income today. The result holds both between countries and within countries.

Even more related to our topic of research, Tang and Leung (2016) showed that countries with a longer history of state-level institutions tend to experience less macroeconomic volatility today. They measured volatility to capture both short-term shocks and the "episodic nature" of growth in most developing countries. Their finding of state history holds for both measures of volatility.

However, according to Spolaore and Wacziarg (2013), historical factors only explain a fraction (between 40 and 60%) of the variation in income per capita. Thus, important as they might be, long-term historical factors are not a definite sentence, and there is still room for policy and mid-term capability building to have a sizable impact on economic performance. Moreover, in an era of unprecedented innovation and rapid technological change, it is at least theoretically possible for backward nations to catch up rapidly. The bad news here is that all successful and ongoing cases of catch-up (the East Asian miracle countries and China) comply with the model of historical state history.

Nevertheless, on the other hand, Abramovitz himself related social capability to more current social traits like education and institutions. This line of research has been mainly explored (although not explicitly under the label of social capability) under the convergence hypothesis and in particular the conditional version. Cross country regressions have shown over and over that the neoclassical prediction of countries converging in the long-term (in terms of productivity) holds only if one controls for some specific traits like human capital and institutions. In other words, only poor countries that are socially advanced converge.

Another way to refer to these country-specific traits or circumstances that ought to determine the long run income level is "growth fundamentals", and there is extensive literature body around that idea. It is important to note that in this literature, these fundamentals refer to the quality institutions and in particular to governance and state capacity, and it is treated as one component of catching up. The other one being structural transformation.

All of the different dimensions of social capability studied in this paper have been studied in relation to economic growth and development under one the convergence hypothesis and/or growth fundamentals. There is a long literature on inclusion and more specifically on inequality and its effects on economic growth. Despite some controversy, the balance tilts towards high inequality – thus the exclusion of large segments of the population of most market opportunities – hurting long-term economic growth and social development. The lack of structural transformation of an economy understood as the completion of the agricultural transformation the attainment of a productive structure both more diverse and complex (Andersson & Andersson, 2019) is

undoubtedly the basis for long-term sustainable economic growth (McMillan, Rodrik & Verduzco-Gallo, 2014). Much less clear is how society manages to successfully achieve this transformation and its many intricacies and difficulties (Timmer, 2009). State capacity to both finance itself (autonomy) and deliver public goods (accountability) is certainly central for sustaining long-term growth and attempting at development. Although the process, as we know is and should be market-based, no country has ever developed without a strong State capable to direct economic activity and/or act to fix market failures in a way that encourages the innovation process and keep elites and vested interests both benefiting from it and providing further incentives to keep investing in the country's productive capacity. While at the same time, the State creates the conditions to include more and more people in the market activities. Finally, lack of social stability is a deterrent for long-term investment and as such negative for economic growth. Societies lacking institutionalized mechanisms for resolving internal conflicts are then much likely to enter into negative growth phases and/or not be able to tap in into specific opportunities that the world economy could offer (Rodrik, 1999).

However, during the last 50 years, little attempts have been made to further specify the concept of social capability and theoretically connecting it to the process of growth and in particular to the possibility of catching-up. Among notable exceptions are Temple and Johnson (2002) who revived the Adelman-Morris Index (AM Index) and showed that fast growth is in part the outcome of "favorable social arrangements." Moreover, while several indicators of the index appeared related to growth, mass communication was found to have a direct effect over TFP.

2.1.3. Latin American Stagnation

The lack of catching-up in Latin America has been often explained in the context of the resource curse, its colonial legacy, or both. The explanations offered for the negative effect of natural resources over long-term economic growth and development are plentiful (Smith, 2007). First, large exports of primary commodities would lead to exchange rate appreciation that turns domestic activity less competitive in the world market. This phenomenon that also includes a labor supply decrease is known as the "Dutch disease." Second, declining terms of trade (Prebisch, 1962) would hinder capital formation necessary for development. This would be reinforced by the volatility of the price of primary commodities. Third, natural resources usually have weak linkages to other industries, and finally, these sectors (in particular minerals and oil) incentivize rent-seeking behaviors which hinder innovation and entrepreneurship and therefore growth (Smith, 2007).

Since first published (Sachs & Warner, 1995) the natural resource curse theory has been highly influential, and countless studies have provided evidence both in favor and against it. However, after more than two decades of research most evidence appears to

point in the direction that natural resources are not necessarily detrimental to growth and development, even in the presence of weak institutions (Sinnott, Nash & de la Torre, 2010, p.23).

The fact that for each cursed country one might easily find a country, rich in natural resources that managed them properly and achieved high rates of growth (Sinnott, Nash & de la Torre, 2010) does nothing but support these findings. Many of the richest – and socially more developed – countries of the world like Norway, The Netherlands, Sweden, Australia, Canada, and Finland developed through the exploitation of natural resources (Bertola & Ocampo, 2012). Finally, during the recent great financial crisis, the countries that suffered the most in terms of growth collapse were those with higher shares of manufacture ion their exports baskets (Sinnott, Nash & de la Torre, 2010).

This does not mean that countries rich in natural resources does not face a set of unique challenges. The "Dutch disease" is a real phenomenon, and the volatility of commodity prices is also well documented (Sinnott, Nash & de la Torre, 2010). Both aspects pose a challenge for developing countries in that situation, indeed, but they are not found to be ultimately unmanageable in any case. However, any path towards development will present hurdles, and the ones posed by possessing natural resources are hardly the most difficult ones to overcome. In fact, reasonably simple policies and orthodox institutions are enough in most cases (De Gregorio, 2013; Sinnott, Nash & de la Torre, 2010). The failure of Latin America cannot be explained by the abundance of natural resources.

The colonial origins of Latin America's underdevelopment have been outlined by renowned scholars. Acemoglu et al. (2001, 2002) argued that the factor endowment (natural resources and large indigenous populations) led to establishing extractive institutions that have persisted and constrained economic performance ever since. Engerman and Sokoloff (2000) argued that factor endowment made Latin America suitable for large-scale agricultural exploitations and large-scale mining activity that resulted in a highly unequal distribution of land in favor of the white settlers. This inequality translated into a highly unequal distribution of wealth and human capital, which again has persisted and translated into a weak economic performance even after independence. Coatsworth (2008) places the origin of Latin American underdevelopment in the colonial period as well but in a different way. For him, the political economy of the Iberian empires resulted in institutions that did not provide enough security to the elites, constraining this way economic activity.

It is undeniable that colonialism exerted a great deal of influence in Latin America, and the arguments provided by the scholars discussed above are probably all partly true. However, much water has passed under the bridge, and after more than two centuries of independence, it is necessary to look for the causes of underdevelopment in places that could at the same time be deemed as ultimate and conduce towards applicable policies.

Most of the literature around Latin America and international crises coincided on that the better response of the region during the GFC, compared to the DC and AC, in terms

of intensity and rebound could be explained by three major factors. First, improvements in the macroeconomic framework are said to have played a significant role. For example, Bumachar and Goldfajn (2012) highlight the introduction of fiscal rules, central banks targeting inflation instead of exchange rates, and the accumulation of buffers (reserves) that allowed them to enact monetary and fiscal stimulus, while Corbo and Schmidt-Hebbel (2013) also add the much lower levels of debt, and more abundant reserves. Second, healthier and deeper financial systems and capital markets, together with more integration and external conditions, are the main responsible for the stronger response of the (Corbo & Schmidt-Hebbel, 2013). Finally, but no less critical, external factors are deemed to have played a big role. Here the influence of China is undeniable. By stimulating its way out of the crisis, China lowered the volatility of commodities and pushed their prices up again very rapidly (Corbo & Schmidt-Hebbel, 2013).

Alvarez and De Gregorio (2014) attempted to investigate precisely the difference between the last three crises. However, due to data restrictions, they confined their investigation to the last two (AC and GFC). Thy found that there were fundamental differences both at the regional level and the international level that might explain the different responses. On the one hand, the GFC saw big monetary and fiscal expansion, and exchange rates were allowed to float. On the other hand, high terms of trade and low interest rates further benefited economic activity.

They conducted a first-difference analysis between the last two crisis considering all developing economies (not only LAC countries) and found that – consistent with the macroeconomic improvements arguments – the better performance during GFC is associated with exchange rate flexibility, lower private rate credit growth, loosening of the monetary policy, and less financial openness. Moreover, the importance of terms of trade and low international interest rates is consistent with the global environment playing a major role.

For Ocampo and Parra (2006), however, the dual divergence that the developing world experienced between 1980 and the early 2000s, where not only these countries experienced a divergence with respect to the developed world, but there was a remarkable difference in growth rates within the developing world too. Low-income countries tended to grow less than middle-income ones. They show that this periodization of growth *successes* and *collapses* must be explained by external factors (Ocampo & Parra, 2006). Nevertheless, the broad range of experiences among seemingly similar countries must be explained by internal factors (Ocampo & Parra, 2006).

2.2. Theoretical Approach

Standard growth theory does not provide any good way to account for episodes of economic shrinking or output collapses other than being the result of external shocks that "either move the steady state level of income or alter the per capita stock of physical and/or human capital" (Hausmann, Rodriguez & Wagner, 2006, p.10). On the historical side, Schumpeter (2017) viewed crisis or recession as an integral part of long business cycles and as such inevitable and necessary for subsequent growth. Although it is undeniably true that both shocks and economic cycles could indeed explain some episodes and/or specific aspects of economic downturns, they are unable to tell the whole picture. For instance, what then accounts for the variation between seemingly similar countries going through the same cycle or faced with the same external shock? How could this explain the fact that Australia has not experienced a recession in more than a quarter century while every other developed country has?

Broadberry (2016) and Broadberry and Wallis (2017) borrowed from the institutional framework proposed by North, Wallis, and Weingast (2006) to suggest that the process of development could be understood through the transition from a society of identity rules to a society based on impersonal rules. Societies based on identity rules experience episodes of growing and shrinking, and in order to break away from this pattern, it is necessary to transition to a society governed by impersonal rules. In a first iteration, Broadberry and Wallis (2016) suggested that the episodic nature of growth in identity societies could be a result of "disruptive competition between elite coalitions" (Broadberry & Wallis, 2016, p.17). North, Wallis, and Weingast (2006) had offered an attempt of explanation where modern social development depends on the transition from a limited access social order to an open access one.

However, in a later iteration, Broadberry and Wallis (2017) identified this institutional transition (from identity to impersonal) as the ultimate factor and argued that this would operate through a set of proximate factors like structural change, technological change, demographic change and changing the incidence of warfare. Basically, they move away from an elite-based explanation to a more socially-based one.

Is in this context that Andersson (2018) proposes an analytical framework of social capabilities in order to explore the differences in shrinking experiences. This framework identifies five dimensions of social capability intended to identify pervasive and persistent embedded social traits, although not fixed, that make a country to select into more sustainable growth patterns than others. The five dimensions are inclusion, transformation, state accountability, state autonomy, and social stability.

This framework could be seen as a way to deal with the compression of history of the historical approach of Putterman and others that connects the possibility of catching up to social characteristics dating back several hundreds of years. They are certainly not

alone in this view and while it undeniably holds some value, the more recent history and capability building of the last century or 50 years, as well as short-term policies, ought to play a role. And a not minor one.

Delving into the framework itself, the *inclusion* dimension is fundamentally related to the broadening and deepening of the productive capacity. This is, to increasingly expand access to productive resources to larger segments of the population that were previously excluded. It is important to bear in mind that the condition of inclusion or exclusion is complex as individuals are included or excluded respect to others and the opportunities that lay ahead (Oxoby, 2009). However, in concrete terms, discussions about inclusion and/or exclusion tend to focus on poverty, inequality, unemployment, low education attainment, and barriers to social and political institutions.

No matter how one decides to approach this, it seems only intuitive that more inclusive societies where more opportunities to exploit everyone's potential will be more dynamic and more resilient to economic shrinking.

The *transformation* dimension refers to a disposition to exploit modern technology in order to gain productivity in the short run and re-shuffle the economic structure in the long-run. This is done by reallocating resource to from activates with low to high knowledge content. This would reflect both in terms of the structural composition of the economy, particularly the extent of the agricultural transformation, and in terms of the level of diversification and complexity of the productive matrix. An economy less dependent on agriculture (and natural resources) will be less exposed to the volatility that characterizes their prices and demand. Moreover, an economy more diversified and that makes use of higher levels of knowledge on its output base, will be more readily capable of diverting resources from one sector to another and thus avoid the consequences of specific shocks.

This framework identifies three key features of the State in the development process, in particular, to build resilience to shrinking. First, the State must be autonomous from elites and vested interests while still providing a business and institutions environment where those groups want to invest in national development. This, in turn, has two critical aspects to it. First, it is necessary to develop some independent institutions like central banks and development agencies. Second, and perhaps the most important, is the creation of fiscal capacity and a progressive tax system. To this aspect, the framework refers to as *State autonomy*.

Second, once the State has collected, it must be capable of delivering essential public goods and services like infrastructure, education, and health. To this aspect, the framework refers to as *State accountability*. Finally, the State must develop an institutional structure capable of dealing with the conflicts that will arise between different groups of society (Andersson, 2018; Rodrik, 1999). To a combination of this last aspect and the latent social conflict level, the framework refers to as *social stability*.

The connection of this State capability (*autonomy* and *accountability*) and the possibility of catching up and building resilience to economic shrinking is perhaps less intuitive. However, empirically the evidence is strong. No developed country has a tax revenue lower than 30% of the GDP, and although they vary in terms of progressiveness, they all achieve some important level of redistribution. The issue of accountability is even more blurry, but then again, in varying degrees, all currently developed countries engage in delivering infrastructure and some level of welfare state. The question of what comes first is a legitimate one, but some level of accountability seems necessary to modern growth.

Finally, the capability of the State to manage conflicts is arguably the one with a clearer and more intuitive connection to growth and resilience to shrinking: in a very fundamental level, conflict is a deterrent for investment, and a decline in investment is usually the immediate cause of economic downturns (Andersson, 2018).

Now, the process of capability building that would lead to development is chaotic and requires seemingly contradictory things to happen simultaneously (von Borries, 2018). The (socio-economic) system needs to be able to increase productivity, provide formal market access to a greater number of people and groups, keep vested interests, build the modernization and nation-building properties of the State, provide incentives to the elites to invest on the country, deliver public goods and services at an increasing quantity and quality, and develop the institutional structure to solve the conflicts that will emerge during this chaotic process (Andersson & Palacio, 2017).

In this context, our investigation intends to identify how these five dimensions can explain the lack of convergence of Latin America during the last 40 to 50 years by connecting them the tendency shrinking tendency of the countries of the region. Most literature around Latin America and crises have centered on the differences in policy responses between the different cases. We try to go one level deeper into trying to identify the fundamental “whys” that would allow countries on the region to adopt better policies or improve macroeconomic frameworks.

3. Data and Method

This Chapter discusses data and research methods selected to attempt answering our research questions. First, the general data collected to characterize economic performance and episodes of shrinking, and the five dimensions of social capability is presented and discussed in terms of its validity and limitations. Then, we move to discuss the different empirical strategies followed in this paper, together with specific data or variables – constructed based on the raw data – pertinent for each individual strategy.

3.1. General Data

This section presents and discusses the primary information collected to answer our research questions. The paper makes use of public information sources, such as the World Bank, Maddison Project, Penn World Tables, WIID, among others.

Following Andersson (2018), we approach social capability by the characterization of five dimensions: inclusion, transformation, state autonomy, state accountability, and social stability. There is obviously not any perfect measure for any of these dimensions, but we try to proxy them with some well-known indicators. Inclusion is characterized by measures of inequality as the Gini index or top income shares; transformation is characterized by the share of agriculture and manufacture on GDP and employment, and measures of economic complexity and diversification; State autonomy is characterized by the tax revenue over GDP, inflation and independence of the Central Bank; State accountability is characterized by public spending in education; and social stability is characterized by a direct measure of internal conflict and inward FDI flows. Table 3.1 presents a summary of the indicators used and their respective sources.

We constructed four different databases for our different analysis, and Table 7.5 only presents the descriptive statistics main survival analysis. Descriptive statistics for the other three datasets are presented in Tables 7.1 to 7.3 in the Appendix A, and Table 7.5 in Appendix B.

Table 3.1: Main Indicators and Sources

Dimension	**Indicator**	**Source**
Inclusion	Gini Index	Solt, F. (2019)
	Unemployment rate	The World Bank
Transformation	Agriculture share of GDP	The World Bank
	Exports diversification Index	The International Monetary Fund
	Exports quality Index	The International Monetary Fund
	Agriculture share of employment	The World Bank
	Economic complexity Index	The Observatory for Economic Complexity
State Autonomy	Inflation rate	The World Bank
	Central bank independence Index	Garriga, C. (2016)
	Tax revenue	The World Bank
State Accountability	Child mortality rate	The World Bank
	Access to electricity	The World Bank
	Gov. Expenditure in education	The World Bank
Social Stability	Country risk Index	International Country Risk Guide
	Social stability Index	International Country Risk Guide
	Institutional quality Index	International Country Risk Guide
	Ethnic fractionalization	Alesina et al. (2003)
	Linguistic fractionalization	Alesina et al. (2003)
Controls	Net barter terms of trade	The World Bank
	Natural resources rents	The World Bank

Table 3.2: Descriptive Statistics for Survival Analysis Data

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Avg. GDP pc growth (prev. 5 years)	100	3.600	1.922	0.393	8.657
GDP per capita	103	5,133	4,703	243.2	28,727
Log of GDP per capita	103	8.145	0.960	5.498	10.27
Gini Index (SWIID)	80	47.85	6.090	24	60.40
Education expenditure (% of GDP)	75	3.743	1.602	0.905	8.369
Net barter terms of trade	67	113.4	40.20	71.85	306.6
Agriculture share of GDP	97	11.07	8.164	0.948	38.58
Agriculture share of employment	46	19.11	10.48	0.575	37.21
Exports diversification Index	103	3.606	0.814	1.871	5.441
Exports quality Index	103	0.855	0.106	0.578	1.194
Economic complexity Index	58	-0.160	0.481	-1.035	0.984
Inflation rate	103	36.36	125.2	0.705	1,036
Log of inflation	103	15.33	26.14	0.673	190.3
Tax revenue (% of GDP)	63	15.73	4.834	7.276	31.77
Central bank independence Index	93	0.488	0.201	0	0.827
Access to electricity (% of pop.)	64	88.37	8.043	68.03	100
Country risk Index	56	3.791	0.959	2.147	6.725
Institutional quality Index	56	5.596	1.414	2.059	7.615
Social stability Index	56	7.630	1.070	3.750	9.302
NNRR rents (% of GDP)	84	4.393	6.104	0.0102	28.85
Child mortality	101	47.14	41.53	9.780	213.5
Unemployment rate	46	9.379	4.709	2.875	20.22
Ethnic fractionalization	103	0.371	0.195	0.0950	0.740
Linguistic fractionalization	103	0.458	0.206	0.135	0.794
Crisis duration	103	8.107	8.628	2	39
Crisis closed	103	0.845	0.364	0	1
Fall duration	103	3.932	4.759	1	26
Fall closed	103	0.913	0.284	0	1
Peak-bottom ratio	103	0.898	0.117	0.415	1.000

In the following sections, we discuss the selection of variables and sources to characterize economic performance and dimensions of social capability.

3.1.1. Economic performance and Shrinking

The first requirement of our research is to understand the macroeconomic performance of all Latin American countries during the last 50 years. There are numerous measures suitable for this endeavor out there. However, we selected GDP per capita at constant LCU from the World Bank for the following reasons. First, it offers information dating back to at least 1978 of all 33 Latin American countries. The Maddison project has

information further back in time to at least 1960 it covers only 25 Latin American countries, while the Penn World Tables has covers 31. Second, the measure in local currency appeared as the most reliable to characterize episodes of shrinking and crisis. Finally, although it is commonplace to use GDP per worker as a measure of output in this kind of investigation, a per capita measure is more in line with the concept of social capability. We are not only interested in productivity but also the welfare of the population.

However, a measure in local currency makes the comparison of income levels impossible; thus in the cases, we need to control for it, we rely on GDP per capita at Current US$ of the World Bank database.

3.1.2. Inclusion

This dimension is related to the distribution of productive capabilities throughout the population and the capacity of the system to provide increasing opportunities to participate in the formal economy (Andersson, 2018). As such, the primary indicators of social inclusion are those of inequality, poverty, and labor market participation. According to Oxoby (2009), the most relevant ones would be income quintile ratios, the persistence of low income, and long-term unemployment rate.

However, we do not have data for those indicators for our set of countries and study period. Thus, we proxy social inclusion with the market *Gini index* extracted from SWIID (Solt, 2019), and the *unemployment rate* (ILO) from the World Bank database. The SWIID is an effort made by Frederick Solt (2019) to consolidate both market and consumption Gini Index series based on the WIID (World Income Inequality Database). This is arguably the best source for long-term inequality trends for cross country comparisons. However, we had to complement it with specific points form the WIID caring that the data was consistent with our measure. Furthermore, we extended every border point four years backward and/or forward in order to gain coverage and considering that inequality is reasonably persistent, and a measure taken within four years would be representative enough for our purposes.

3.1.3. Transformation

As we know it, development entails a structural transformation of the economy. And not just any transformation but one in which output and employment shifts from agriculture to manufacturing and high productivity services. An economy less based on agriculture it becomes less vulnerable to world market changes and therefore more resilient to shrinking. However, the kind of transformation we are looking for would also entail that

the production structure of the economy become more complex and diversified (Andersson, 2018).

As such, the transformation dimension would be ideally characterized by the share of GDP and employment of the agriculture sector and measures of economic complexity. In this regard, we rely primarily on *agriculture share of GDP* taken from the World Bank database, and measures of *exports diversification* and *exports quality* confectioned by the International Monetary Fund. These indexes are based on bilateral trade flows at the 4-digit SITC level. We have modified the *exports diversification index* in order that higher values indicate more diversification. Higher values of the *exports quality index* indicate higher quality.

We also collected information on *the agriculture share of employment* from the World Bank database, and the *economic complexity index*, and use them for some specific analyses. The *economic complexity index* was developed by the Observatory of Economic Complexity (Simoes & Hidalgo, 2011) and intends to capture the "capacity to identify, create and use knowledge in a productive way" (von Borries, 2018, p.13). However, we rely primarily on the indicators presented above because of the coverage of countries and years they provide.

3.1.4. State Autonomy

Different aspects of State capacity have been long thought to be central for the development process. In particular, here we center on a rather central aspect of it, namely State Autonomy, which could be understood primarily as the capacity of the bureaucratic apparatus to isolate itself from vested interests. However, autonomy is not about a struggle between the state and the elites, which would certainly be detrimental for broad-based welfare but about a balance between nation-building and provide incentives and opportunities for investment and legitimate enrichment.

As such, one of the major indicators of an autonomous state is the development of fiscal capacity and moreover a progressive fiscal system. Another area where one could search for indications of autonomy is in the presence of independent central institutions like Central Banks, or other productive development agencies.

However, tax revenue is scarce for Latin America; thus in order to proxy this capability, we relay in the *Central Bank Index* by Garriga (2016) and the measure of annual *inflation* form the World Bank database. Our measure for the latter is borrowed from Bluhm et al. (2013): $100 \times \ln(1 + \text{inflation rate})$.

3.1.5. State Accountability

Once the state has been able to build fiscal capacity and therefore collect taxes, the next step is delivering public goods and services. The capability associated with this aspect is denominated here State Accountability. This is reflected in the patters of public spending in different sectors, and more accountable states are expected to both higher and more stable levels of spending in areas like education and health. This shows a real commitment detached from economic cycles.

As Palacio (2018) argues, the level of accountability might also show in some specific outcomes form policies, in particular health, educational attainment, or infrastructure. Therefore, for this capability, we rely on measures of *child mortality*, *access to electricity*, and government *expenditure in education*. All are extracted from the World Bank database.

3.1.6. Social Stability

Social Stability is almost intuitively a pre-requisite for development. It is commonplace to attribute the lack of it around regions like Sub-Saharan Africa and Latin America to the recurrent internal armed conflicts and/or civil wars.

Two underlying mechanisms are identified here. On the one hand, a conflictive environment brings uncertainty, which translates quickly into a negative attitude towards investment and which usually predates periods of output shrinking. On the other hand, in developing unstable societies, the already limited state capacity is shifted towards conflict resolution instead of promoting developmental policies.

However, the understanding of social stability here goes beyond the presence or absence of conflict towards the presence and quality of institutions for conflict resolution. As said, the development process is bound to raise internal conflicts even in previously peaceful societies, and the capacity of the institutional structure to deal with those events is thought to be central to avoid downturns.

As such, we constructed three measures to characterize this capability, all based on the International Country Risk Guide dataset, which includes different factors affecting individual country risk between 1984 and 2016. The first measure we use is the standard index that is the sum of all factors and ranges from 0 to 10, with higher values indicating higher risk. The second is a measure of latent social stability (Rodrik, 1999), which we have called the *"social stability index"* and is a composition of the following factors: *"Internal Conflict," "Religious Tensions,"* and *"Ethnic Tensions."* We constructed this index to range from 0 to 10, with higher values indicating more stability. Finally, the third is a measure of conflict management institutions which we have called *"institutional quality index"* and is a composition of the following factors: *"Government Stability," "Military in Politics," "Law and Order," "Democratic*

Accountability," and *"Bureaucracy Quality."* We constructed this index to range from 0 to 10, with higher values indicating better institutions. We also include, in some analyses, the measures of *ethnic and linguistic fractionalization* of Alesina et al. (2002), mainly for comparative purposes, since these measures have been extensively used in previous research.

3.1.7. Other

We have collected data to characterize two factors that could account for external circumstances and/or luck: *Net barter terms of trade*, and *natural resources rents*, both obtained from the World Bank database. With these indicators, we expect to capture changes in the world market that might drive up or down economic performance but are exogenous to the process of social capability formation as long as that is possible.

3.2. Research Methods

The present is a quantitative empirical investigation of the ultimate causes of why some countries show more resilience to economic shrinking than others. This takes the form of quantitative empirical research in which we follow three different strategies in order to explore the different levels in which social capabilities could be related to episodes of shrinking. However, for all three strategies, the basic approach is to estimate different versions of the following equation.

$$Y_{it} = \alpha + \beta_1 SC_{it} + \beta_2 X_{it} + \varepsilon_{it} \quad (1)$$

Where Y_{it} denotes a measure economic performance (growth, shrinking, years of negative growth, etc.), SC_{it} is the set of social capabilities proxied by different indicators, and X_{it} is the vector of control variables. Social capability dimensions indicators are measured as an average of 10 years before the growth or shrinking observation. For example, if Argentina registered growth of 1% in 1990, the corresponding inflation rate to that observation is the average between 1981 and 1990.

Indicators used to control for external circumstances or luck (*terms of trade* and *natural resources rents*), on the other hand, are not measured as moving averages. Instead, since we are trying to measure the effect of relevant external factors at one point in time, we measure them at the onset of shrinking episodes or international crises.

3.2.1. Shrinking Episodes Analysis

This first approach pursues the exploration of how social capability is related to the length and magnitude of shrinking episodes. In order to delve into this exploration, we follow two strategies. In the first one, we identify episodes of *"crises"* following Hausmann et al. (2006), and for each, we measure the duration and intensity. A crisis is understood here as "an interval that starts with a contraction of output per worker and ends when the value immediately preceding the decline is attained again" (Hausmann, Rodriguez & Wagner, 2006, p.6). In order to characterize each episode, we construct three variables to be used in the left-hand side of equation (1), as follows:

- ***Crisis duration:*** Number of years between the beginning and the end of the crisis.
- ***Fall duration:*** Number of years between the beginning of the crisis and its lowest point.
- ***Recovery duration:*** Number of years between the lowest point of the crisis and its end.
- ***Crisis intensity:*** Ratio between the GDP per capita at the bottom of the crisis and GDP per capita at the onset before the crisis (peak-bottom ratio). A higher value indicates a less severe crisis.

Table 3.1 presents a graphic description of a crisis, its different points, and durations. We identified 103 crises between 1970 and 2016 with an average duration of 8 years and an average intensity of 10%. Only 16 of the 103 episodes were not closed by 2016, representing roughly 12%. Table 7.4 in the Appendix presents the characterization of each episode indicating onset year, bottom year, exit year, status (close=1 / open=0), and intensity.

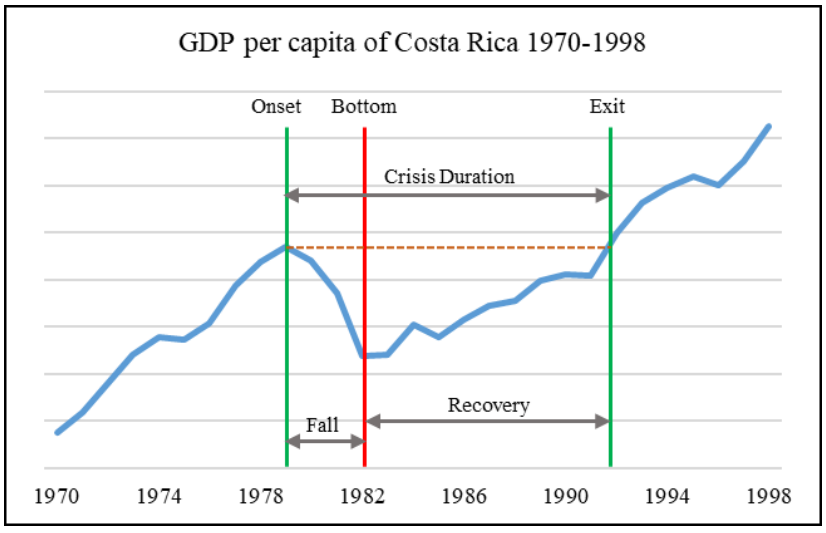

Figure 3.1: Graphical Representation of a Crisis and its Phases

For all durations – *crisis duration*, *fall duration*, and *recovery duration* – we rely on survival analysis methods, which "models the probability of an event occurring at a certain time conditional to the event not having occurred before" (Bluhm, de Crombrugghe & Szirmai, 2013, p.29), and therefore we use it here to understand how social capability might influence the length of each phase of the crisis.

This type of analysis has gained increasing relevance because it uses the information of both censored and uncensored events for the derivation of the likelihood function (Hausmann, Rodriguez & Wagner, 2006). This comes in handy for our analysis because a relevant fraction of our crisis' episodes was not closed by 2016, the last year of data available.

There are basically two approaches to model survival functions: semiparametric and parametric models. Semiparametric is associated with the estimation of Cox proportional hazard models (Hausmann, Rodriguez & Wagner, 2006). Parametric models involve an assumption regarding the distribution or functional form of the hazard function, typically lognormal, Weibull, or exponential. However, all approaches essentially estimate the following equation:

$$h_j(t) = g(t, \beta_0 + X_j\beta_x) \quad (2)$$

That is, the intensity with which the event occurs for individual j is a function of the time and a set of predictors or covariates X_j. What changes, as already explained, is the specification and functional form (Cleves et al., 2010, p.19).

Both parametric and semiparametric models have advantages and disadvantages. While semiparametric models are more flexible, a correctly specified parametric model should lead to a more precise estimate of the hazard function. In this paper, we rely on semiparametric Cox proportional hazard models.

We considered complement this analysis with panel data dynamic random-effects regressions. Although we opted not to include it in the body, a description of the method, the descriptive statistics, and the main results are included in Appendix B.

Finally, when studying the determinants of the intensity of a crisis, a regular OLS regression of equation (1) is used, with the peak-bottom in the left hand-side.

3.2.2. International Crises Analysis

The primary purpose of our second approach is to explore how social capability might help to explain the differences in performance of Latin American countries during times of international crisis. Moreover, in a way, we are also exploring the determinants of the likelihood of experience an output downturn given a scenario of global turmoil.

Therefore, for this second strategy we make use of the "natural experiments" of broad international crises (The debt crisis of the 1980s, the Asian crisis of the late 1990s, and the great financial crisis of the late 2000s) in order to study how the response of countries to external crises is mediated by the level of social capability. Since we are dealing with major global events, the beginning of each one is not much debated, but we fix the first year of each crisis as the first year of negative growth at the regional level (1981, 1998, and 2009 respectively).

We construct the following two variables in order to measure economic performance and shrinking, and use them in the left-hand side of equation (1):

- ***Average growth rate:*** The average growth rate of the next five years since the onset of the crisis.
- ***Years of shrinking:*** Count of the years of negative growth experienced during the five years after the onset of the crisis. Variable takes values between 0 and 5.

With *the average growth rate*, we also pursue a complementary approach by estimating equation (1) in a first-difference setting or equation (3). Basically, we replace "absolute values" by the difference between the different crises, in this case between DC and AC, AC and GFC, and DC and GFC. In formal terms, we estimate the following equation:

$$Y_{it,c1} - Y_{it,c2} = \alpha + \beta_1\left(SC_{it,c1} - SC_{it,c2}\right) + \beta_2(X_{it,c1} - X_{it,c2}) + \varepsilon_{it} \qquad (3)$$

Where Y denotes economic growth average for a certain period, SC a vector of social capability indicators, X a vector of control variables, and c1 and c2 denote two different crises (DC, AC, or GFC).

3.3. Expected results

In general terms, we would expect to find that better social capability leads to higher more resilience to shrinking. This would translate into finding a positive relationship between the different aspects of social capability and growth and a negative relation with the likelihood of shrinking. Moreover, in the context of an international crisis, a higher level of social capability would lead to avoid or minimize an output downturn. Also, when a country enters into a recessionary period, social capability would help to minimize its extent both in terms of duration and intensity.

In accordance with our theoretical framework, by *countries with higher level of social capability* we understand countries more socially and economically inclusive, with higher capacity to make productive use of modern technology, with States both more

autonomous from elites and vested interests and capable of delivering public goods and services, and more stable societies both in terms of the latent level of inter-group conflicts and in terms of the quality of the institutions present to deal with them.

3.4. Limitations

This line of research presents us with some challenges and limitations. Regarding the data, although we have attempted to collect information to characterize all thirty-three Latin American countries during the study period, we have some important information gaps. First, Central American countries, and in particular, the Caribbean islands are highly under-represented in the data. Second, information prior to 1990 is much scarcer and, again, when it is available, it is much more abundant for South American countries and in particular the south cone. However, some non-South American countries also present good information availability like Costa Rica, Honduras, and Jamaica.

Regarding the research methods, any exercise of this kind is subject to several types of specification bias, among them simultaneity bias, omitted variable bias, and inadequacy of the linear specification (Hausmann, Rodriguez & Wagner, 2006). Simultaneity bias could be present due to the clear interconnection between the different dimensions of social capability. Faced with the lack of a proper theory of economic shrinking and output crises, omitted variable bias is certainly present in this investigation.

Endogeneity is usually a problem in cross country growth regressions. Most of the variables used to explain growth differences are thought to be endogenous to growth and development. However, this seems to be much less of a problem here since it is much harder to argue that social capability dimensions, given their high persistence, are endogenous to the business cycle or moreover to a future potential event of shrinking. Nevertheless, it is still very likely that the level of social capability of a country is a function of the historical growth trajectory. It is plausible that a country with episodic growth would, for example, have a harder time to include more people into the formal economy, to develop a state capable of collect and commit to and deliver public goods, or implement the institutions necessary for conflict solving affecting directly all aspects of social capability.

We are clearly aware of all these issues being present and affecting in one way or another the results of our investigation. We try to deal with some by some of the bias by measuring every social capability as a lagged average (10 years) and including some controls to account for specific periods thus eliminating the feedback effect of the economic cycle (Bluhm, de Crombrugghe & Szirmai, 2013). However, given the exploratory nature of our research and the fact that there is no bullet-proof way to deal

with these issues, we do not move further to, for example, try and find instruments for each social capability, which would be the formal way to deal with endogeneity.

A final concern regarding specifically our survival analysis is that countries experience several crises, which in our case is not a minor concern given that we have identified more than three episodes per country on average. In order to deal with this, namely the dependence across episodes, we follow Bluhm et al. (2013), and in the robustness analysis we allow the parameter estimates variances to be correlated – or clustered – across countries.

4. Empirical Research

This Chapter presents the empirical analysis carried out in this paper. First, we make a quick overview of the economic performance and the incidence of shrinking in Latin America since 1970, the evolution of social capability and their relationship with economic performance for the period. Then we turn to investigate our research questions and delve the potential relationship between social capability – its five dimensions – and economic shrinking with the three different strategies presented above.

4.1. Economic Performance and Shrinking 1970-2016

This section presents the evolution of shrinking, social capabilities, and growth in the region for the last 50 years. Figure 4.1 shows the number of years of shrinking for all the countries of the region by decade since 1960. The figure also presents how these episodes divide in terms of the intensity and the average growth of the region for each decade. Unsurprisingly "the lost decades" (Easterly, 2001) of the 80s and 90s when particularly low growth rates were registered in most of the region coincide with higher frequencies of shrinking.

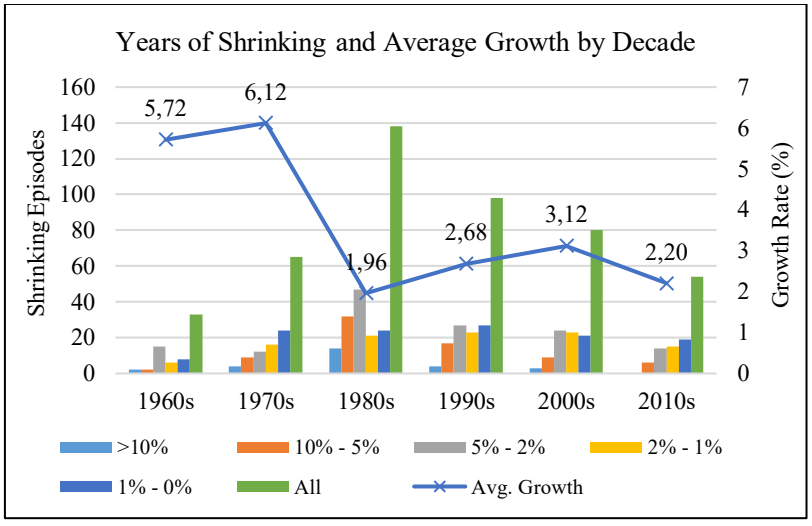

Figure 4.1: Years of Shrinking and Average Growth Rates by Decade

Note: Bars represent the number of years of shrinking at different intensities among LAC countries in each decade. For example, the yellow bar for the 1980s indicates that there were 20 episodes of shrinking of an intensity between 1% and 2% (negative growth) among all LAC countries during that decade.

Table 4.1 presents a more detailed picture by country showing the occurrence of significant shrinking episodes (more two years of consecutive shrinking) and the shrinking frequency in 20-year periods (1960 to 1979, 1980 to 1999, and 2000 to 2016). Here we can see again that shrinking episodes were much more prevalent during the 1980s and 1990s than in the previous and posterior decades.

Table 4.1: Shrinking Frequency and Episodes of Significant Shrinking by Period

Country	Significant Shrinking Episodes			Shrinking Frequency		
	1960-79	1980-99	2000-16	1960-79	1980-99	2000-16
Argentina	0	2	1	0.30	0.45	0.41
Bolivia	0	1	0	0.10	0.45	0.06
Brazil	0	2	0	0.10	0.45	0.29
Barbados	0	2	1	0.10	0.35	0.35
Chile	1	0	0	0.30	0.15	0.06
Colombia	0	1	0	0.00	0.25	0.00
Costa Rica	0	1	0	0.05	0.35	0.06
Cuba	1	1	0	0.35	0.50	0.06
Dominica	0	0	1	0.20	0.05	0.47
Dominican Republic	0	0	0	0.20	0.30	0.18
Ecuador	0	0	0	0.15	0.35	0.24
Guatemala	0	1	0	0.10	0.40	0.06
Honduras	0	1	0	0.20	0.40	0.06
Haiti	1	2	1	0.45	0.60	0.53
Jamaica	1	1	2	0.35	0.40	0.47
Saint Lucia	0	0	2	0.05	0.20	0.59
Mexico	0	1	0	0.00	0.30	0.18
Nicaragua	0	1	0	0.30	0.55	0.12
Panama	1	0	0	0.20	0.20	0.06
Peru	1	1	0	0.25	0.40	0.06
Paraguay	0	0	1	0.10	0.40	0.18
El Salvador	1	1	0	0.20	0.35	0.06
Trinidad and Tobago	0	1	1	0.00	0.45	0.29
Uruguay	0	1	1	0.25	0.30	0.18
Venezuela	0	1	1	0.25	0.60	0.41
Average	**0.28**	**0.88**	**0.48**	**0.18**	**0.37**	**0.22**

Note: Significant periods of shrinking are defined here as 3 or more years of consecutive shrinking (Broadberry & Wallis, 2017).

Figure 4.2 presents a scatter plot of LAC countries, reinforcing the direct relationship between long-term economic growths and shrinking frequency. The countries that have experienced more years of economic shrinking have grown to a lower average rate between 1977 and 2016. Moreover, Figure 4.3 shows how shrinking is associated with a reversal in GDP per capita. While the relation between GDP per capita in 1970 and

shrinking occurrence between 1970 and 2016 is positive, the same relation with GDP per capita in 2016 is negative.

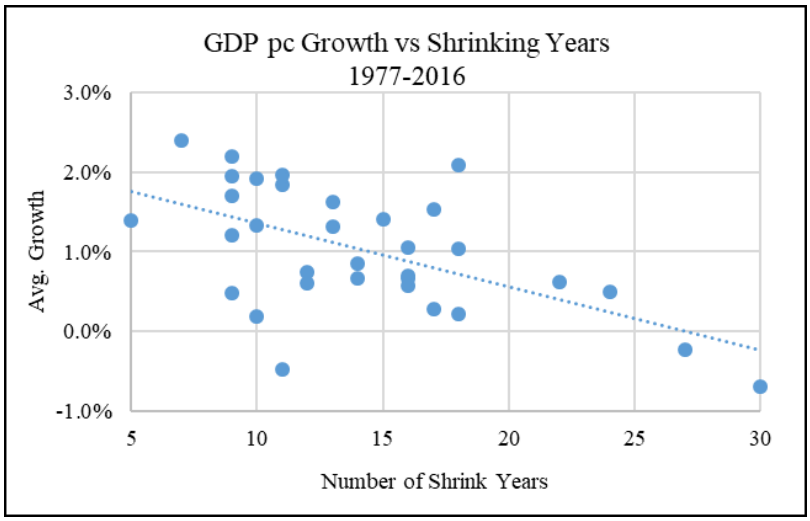

Figure 4.2: Shrinking and Growth 1977-2016

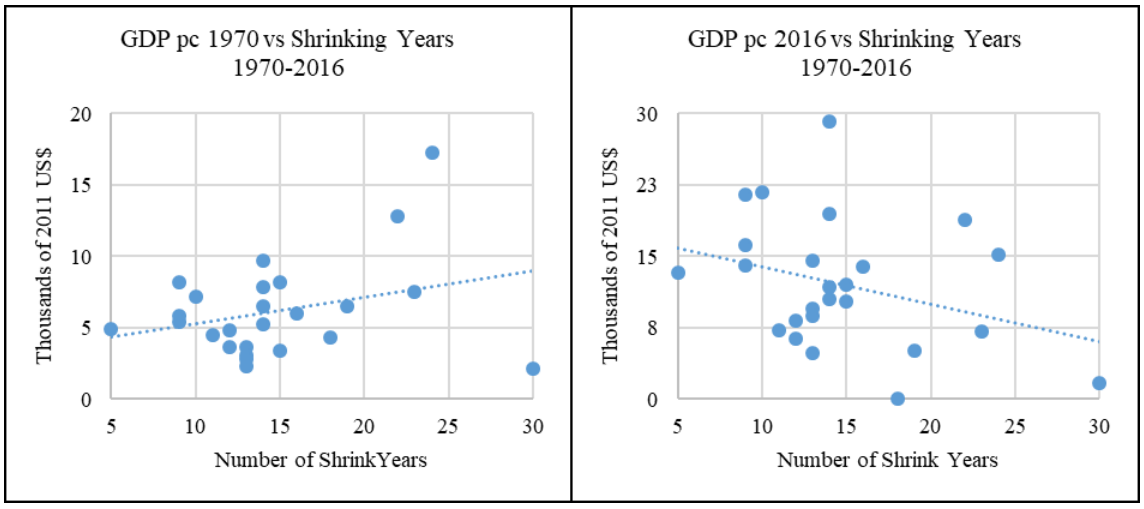

Figure 4.3: Shrinking Years and GDP per capita in 1970 and 2016

Regarding our second research approach which makes use of international as natural experiments, we can see that the economic performance during the last three major crises (Debt crisis, the Asian crisis, and Great Financial crisis), in Figure 4.1 it is possible to appreciate the stark difference between the first two and the last one. Although the decline during the first year of the crisis (year 0) seems to be of a similar magnitude in all three cases, the impressive immediate rebound that appears to "erase" the losses of the previous year, contrasts sharply with the continuing decline and sluggish performance during the debt and Asian crises. Moreover, in Table 4.2 we can

see the variability between countries in terms of average growth and shrinking years during each global crisis.

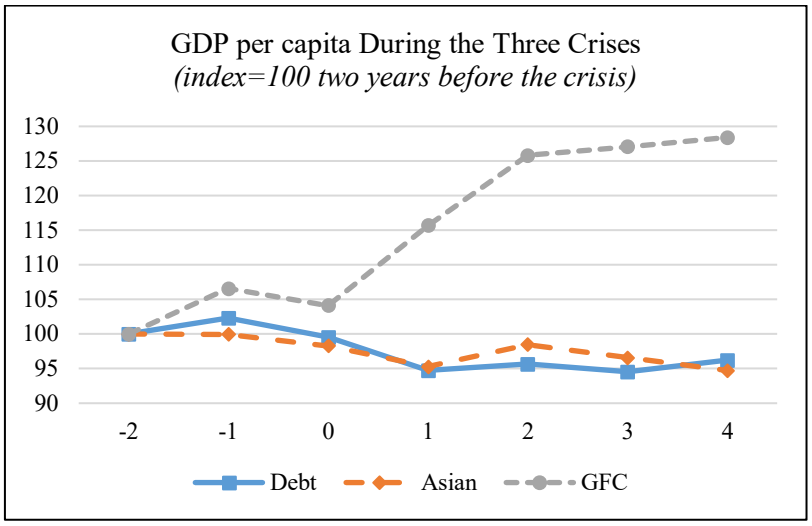

Figure 4.4: GDP per capita During the Three Crises

Table 4.2: Avg. Growth and Shrinking Years by Crisis (five-year period)

Crisis	Average Growth (%)			Shrinking Years		
	Min	Max	Mean	Min	Max	Mean
Debt	-4.40	8.01	-0.44	0	5	2
Asian	-4.32	6.73	0.95	0	5	2
GFC	-4.83	5.10	1.16	0	4	2

All in all, it is possible to see that there has been an inverted relationship between growing and shrinking episodes. On the one hand, while during the 1960's and 1970's low rates of shrinking coincided with high average rates of GDP per capita growth, after the lost decades where growth plummeted, and shrinking rates skyrocketed, the performance between 2000 and 2016 has been right in the middle. However, the growth rate seems to have responded less than the decline in shrinking would suggest. On the other hand, the ability to navigate international crises and avoid major output collapses appears to have significantly improved.

4.2. Social Capability in Latin America 1970-2016

Now we briefly discuss the evolution of social capability in Latin America between 1970 and 2016 through our selected indicators. The main indicators chosen for our

analysis are presented and discussed for a set of 5 countries and the region's unweighted average. The countries are selected in order to be representative of the general trend but also of the diversity of experiences in the region. All figures presented are 10-year moving averages.

4.2.1. Inclusion

Latin America is one of the more unequal regions of the world, if not the most. Figure 4.1 shows the evolution of the Gini Index for selected countries of the region since 1970, and it is possible to see how this evolution has been non-monotonic, and usually, countries have mostly followed similar trends. However, during the last decade there is a clear downtrend that has been exhaustively studied (Bertola, 2016; Bertola & Ocampo, 2012; Rodríguez Weber, 2017; Sanchez-Ancochea, 2017) and is usually attributed to the wave of progressive governments that coincided roughly between the late 1990s and the early 2010s (Bertola, 2016).

In terms of the unemployment rate, we have information for only the last 25 years, and for this period there is not a clear trend. Some countries have been very successful in keeping unemployment down – below 6% - like Peru, Mexico, and the Dominican Republic, while others like Chile and Colombia have struggled more. All in all, there does not seem to be a clear improvement in terms of inclusion in the region for the last 45 years.

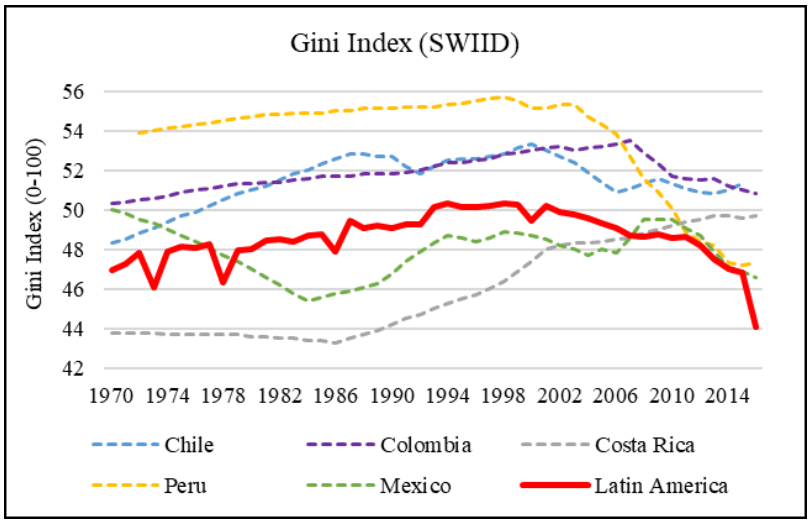

Figure 4.5: Gini Index for Selected Countries

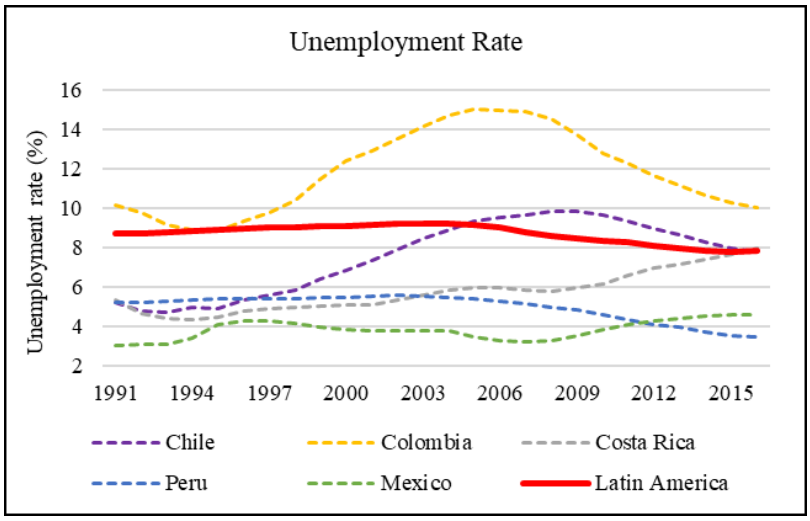

Figure 4.6: Unemployment Rate for Selected Countries

4.2.2. Transformation

Regarding the transformation side of social capability, Figures 4.7 to 4.10 present a mixed picture. On the one hand, both agriculture share of GDP and employment, has decreased significantly, signaling that the agricultural transformation is occurring. On the other hand, while the region has diversified its exports matrix on average, it has lost in terms of complexity. This means that on average economies have moved to the exportation of a broader base of simpler goods and services.

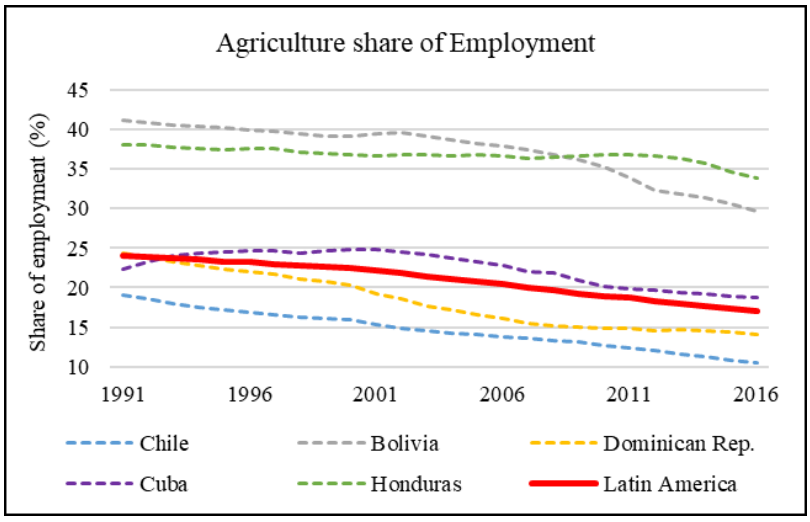

Figure 4.7: Agriculture Share of Employment for Selected Countries

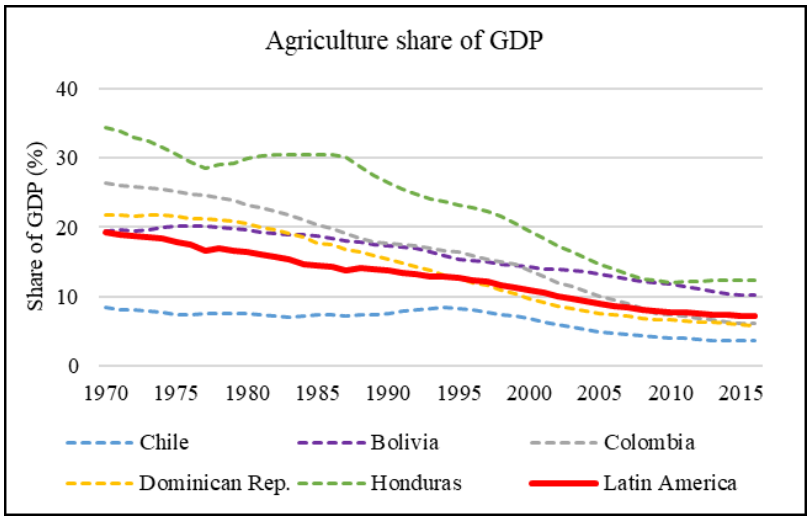

Figure 4.8: Agriculture Share of GDP for Selected Countries

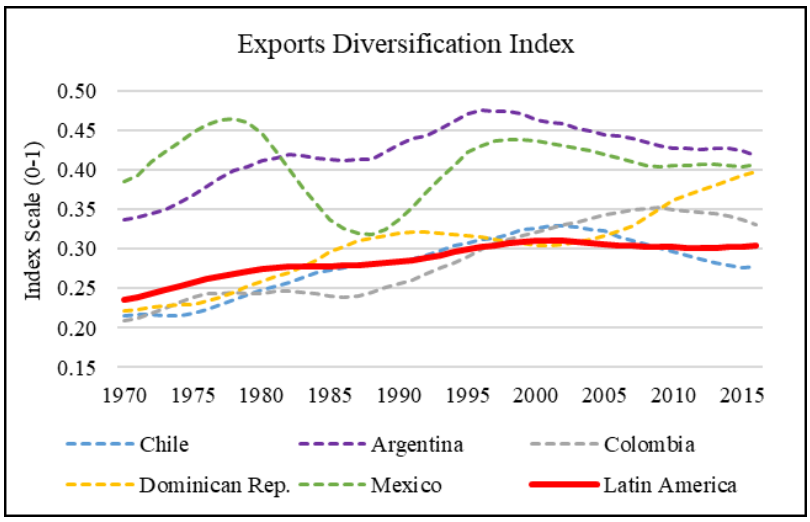

Figure 4.9: Exports Diversification Index for Selected Countries

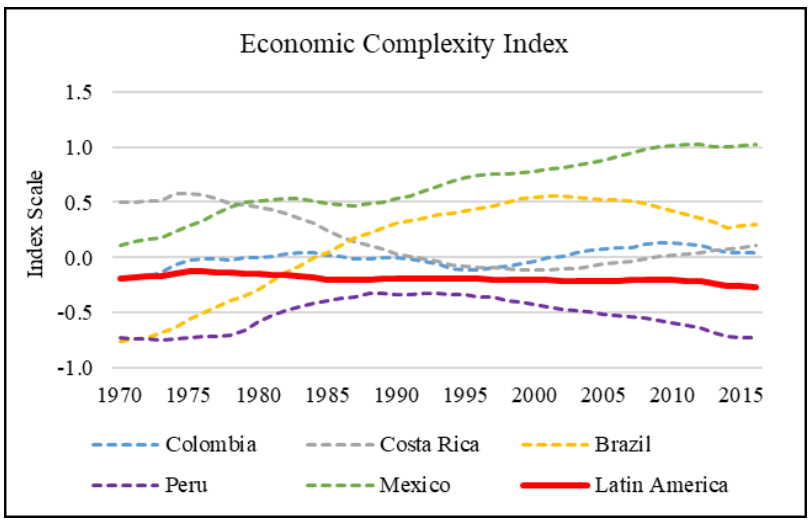

Figure 4.10: Economic Complexity Index for Selected Countries

4.2.3. State Autonomy

State Autonomy presents a somewhat mixed picture. On the one hand, the region as a whole seems to have made meaningful progress in implementing key institutions, in particular, independent central banks (see Figure 4.11) which have arguably helped to control inflation as seen in Figure 4.12.

On the other side, the fiscal capacity of the State has made some improvement in the last 40 years. The tax revenue as a percentage of GDP has gone up from around 15% in 1975 to 17% in 2016. However, this is still quite far from the average of 34% of the OECD countries. Moreover, the taxation system is still highly regressive when compared to OECD countries. Income tax represents more than 60% of the tax base in the OECD and only around 35% in Latin America.

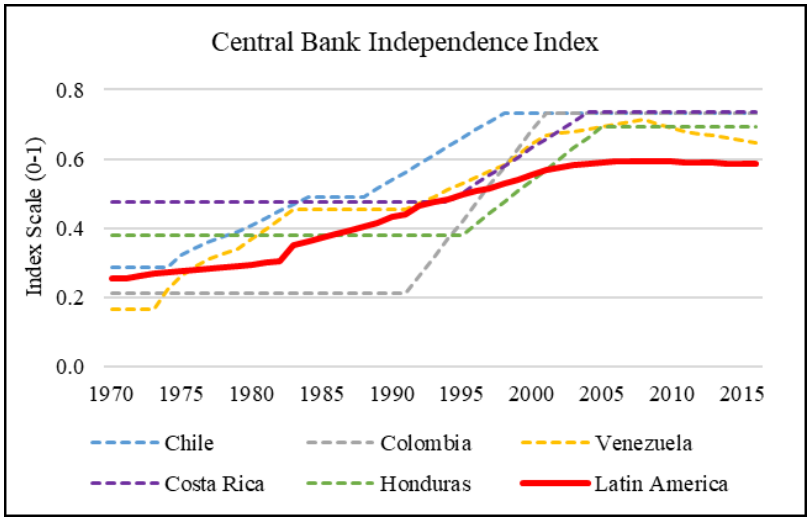

Figure 4.11: Central Bank Independence Index for Selected Countries

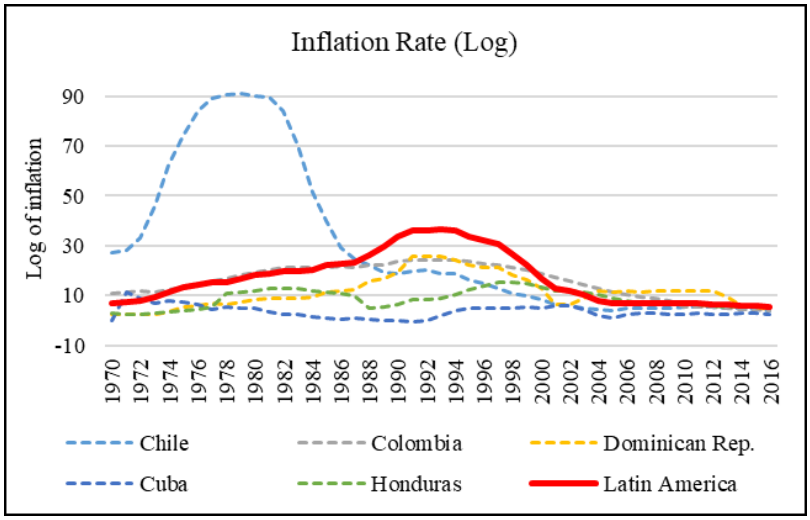

Figure 4.12: Inflation Rate (log) for Selected Countries

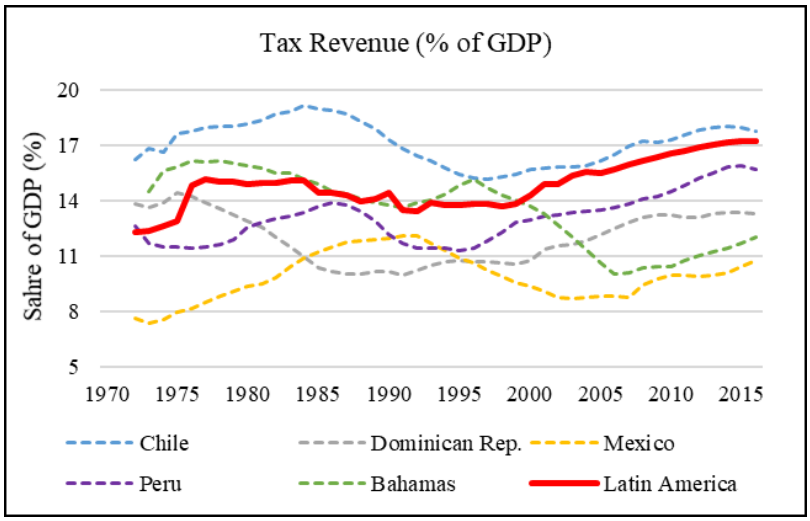

Figure 4.13: Tax Revenue for Selected Countries

4.2.4. State Accountability

In terms of State accountability, there seems to have been substantial progress when measured in terms of tangible outcomes in health or infrastructure provision, in particular, child mortality and access to electricity as seen in Figures 4.14 and 4.15.

However, in a more profound level there the improvement observed in terms of government expenditure in critical public services like education and health is only limited in the overall and varies much more across different countries as seen in Figure 4.16.

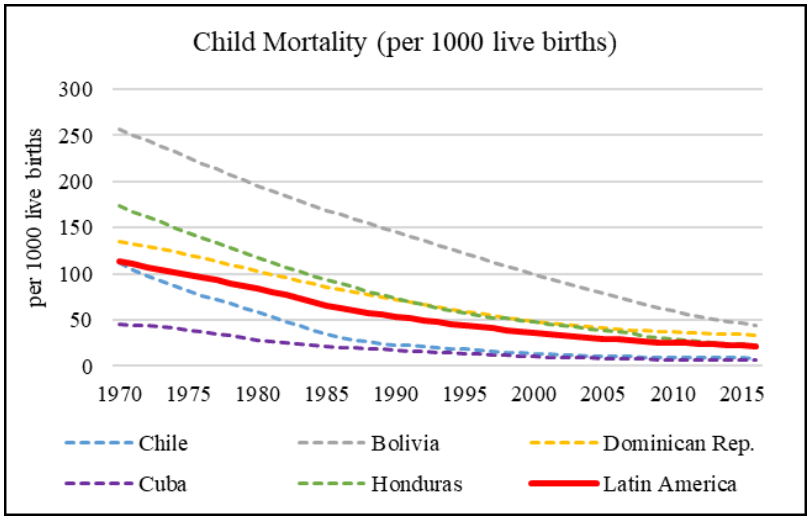

Figure 4.14: Child Mortality for Selected Countries

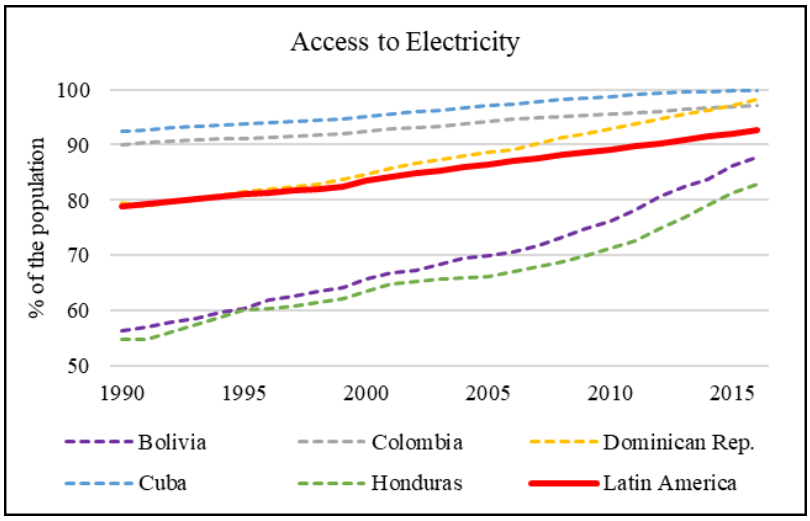

Figure 4.15: Access to Electricity for Selected Countries

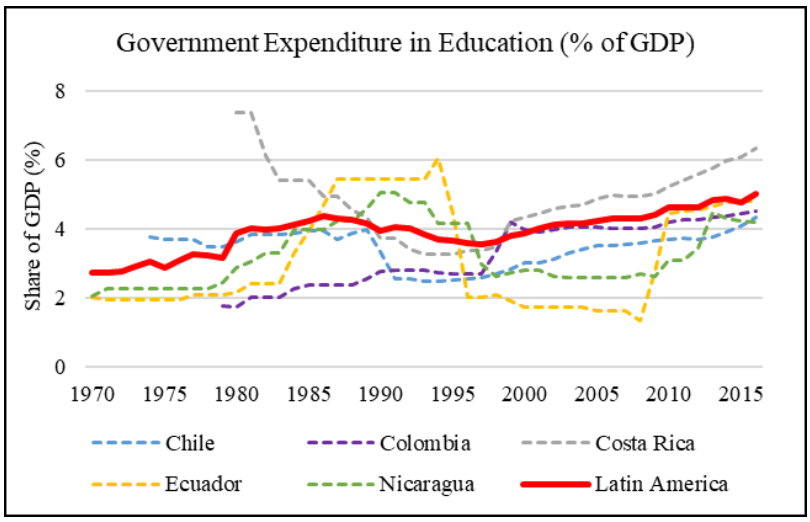

Figure 4.16: Government Expenditure in Education for Selected Countries

4.2.5. Social Stability

Finally, the social stability aspect of social capability seems to have made significant progress both in terms of lowering "latent" social conflict (Figure 4.17) and in terms of improving the quality of the institutional framework in order to deal with potential conflicts between different groups (Figure 4.18).

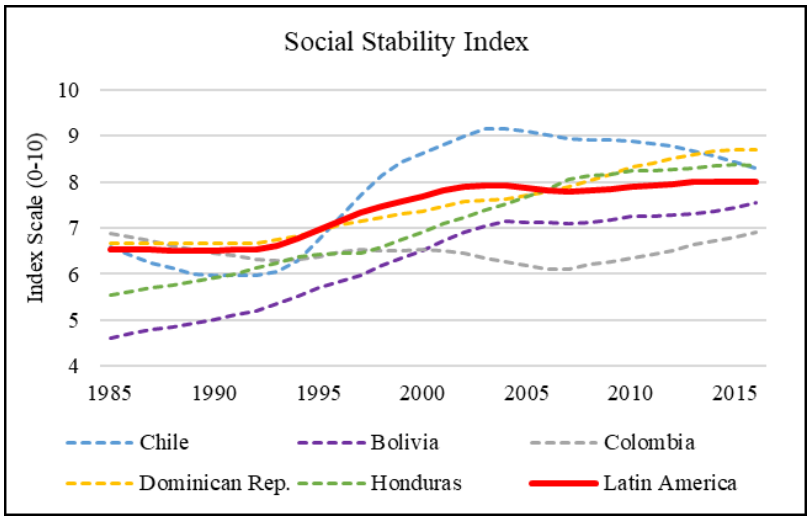

Figure 4.17: Social Stability Index for Selected Countries

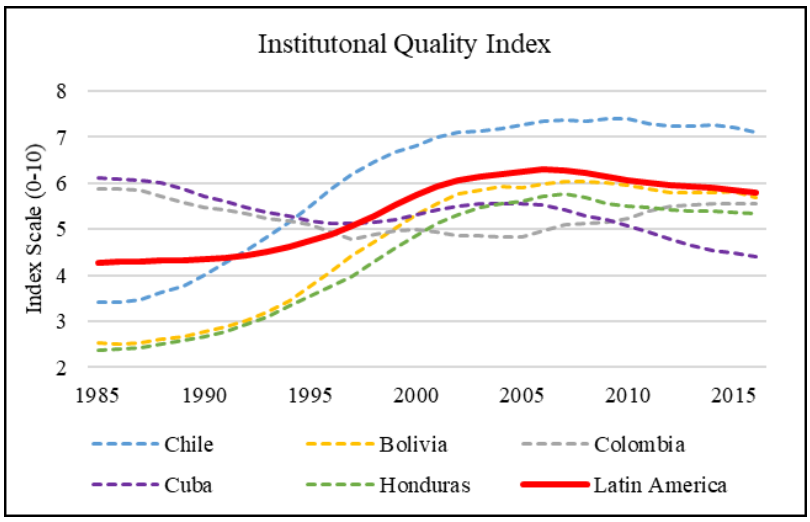

Figure 4.18: Institutional Quality Index for Selected Countries

4.3. Empirical Strategies

The following sections present the results of the two different empirical approaches discussed above. First, we explore the ration between social capability and various aspects of shrinking episodes and crises. Then, we move to use international crisis as natural experiments to understand how social capability might have determined the different responses across countries of the region, and what could explain the better performance during the last great financial crisis and the previous two ones – the debt crisis of the 1980s and the Asian crisis of the late 1990s.

In light of the lack of theoretical mathematical model and exploratory nature of our analysis, we refrain from analyzing the magnitude of the coefficients. Instead, we will

comment on the direction of coefficients and ratios, and their statistical significance only.

4.3.1. Shrinking Episodes Analysis

The primary purpose of this first analysis is to explore different aspects of the relation between social capability and shrinking episodes. In particular, the duration of the different phases, namely the whole crisis, the decline or "fall", and the recovery, as well as the intensity of the crisis. We begin by identifying episodes of crisis in all the countries of the region since 1970. The definition of a crisis – and the heart of the analysis – is borrowed from Hausmann et al. (2006) and comprehends a period beginning with a shrinking of GDP per capita and ending with it reclaiming the value it had before the initial downturn (see Figure 3.1).

Figure 4.19 presents the survival (Kaplan-Meier estimate) and the smoothed hazard functions for the duration of crises. We can see that the smoothed is downward sloped after the first few years indicating that the probability to remain in the crisis diminishes as time passes. However, we can see that there is a late small bump in year 20, indicating that once a country has reached that many time in a crisis, it becomes harder to exit. However, after year 24, the slope is downwards again. Unconditional Survival and Smoothed Hazard Functions for fall and recoveries are included in the Appendix A (Tables 7.1 and 7.2).

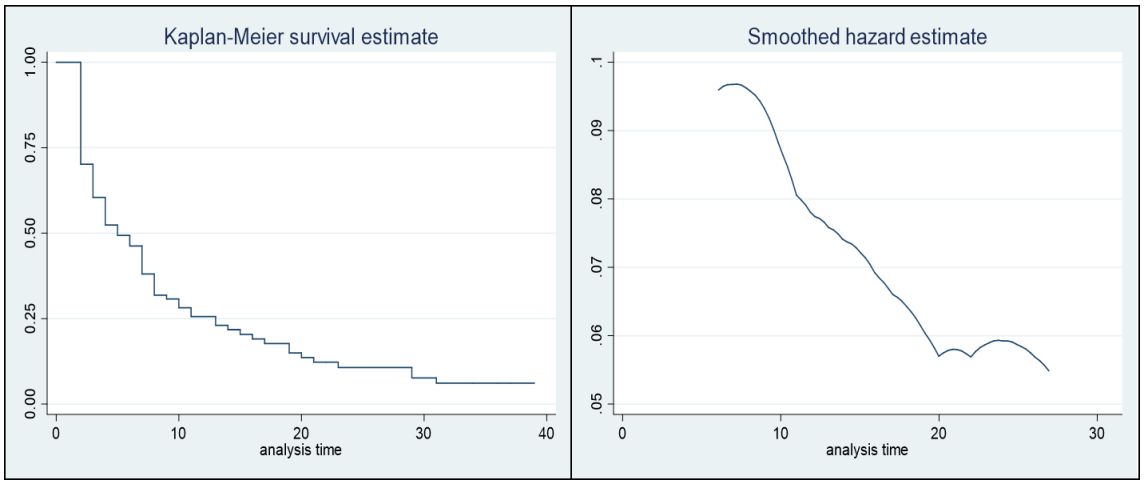

Figure 4.19: Unconditional Survival and Smoothed Hazard Functions

Given the limited quality and availability of information to characterize social capability, our first approach is first to fit variable-by-variable regression, including only the controls related to GDP per capita level and past growth. This is the same strategy that Berg et al. (2012) and Bluhm et al. (2013) followed on their research about

growth and stagnations spells, respectively. Results are presented in Tables 4.2 to 4.4 for whole crises, falls, and recoveries, respectively. We provide information regarding the hazard ratio, p-value, the number of episodes considered (Episodes), the number of episodes finished (Exits), the number of years under the specific period (crisis, fall, recovery), and the log-likelihood (log L) that could serve as "indication to assess potential improvements by the addition of other variables" (Bluhm, de Crombrugghe & Szirmai, 2013, p.34). The first two rows in each table present the values for the control covariates fit together, and from there on only the additional social capability covariate grouped by social capability dimension. It is worth re-stressing that in every model we are controlling for GDP per capita level and past growth. In the case of recovery, we also control for the bottom-peak ratio, which is, as expected, highly significant both economically and statistically, but we do not include it in Table 4.5.

To read hazard ratios, it is necessary to understand that they pivot around the unit. A hazard of 1 means that the probability to exit the spells is not affected by the related covariate. A hazard ratio greater than 1 signals a higher instantaneous probability of termination, which we will call here an "opening" effect of that covariate over duration. Conversely, a hazard ratio lower than 1 signals a "protective" effect, or a lower instantaneous probability of termination (Bluhm, de Crombrugghe & Szirmai, 2013).

Table 4.3 shows our results for crisis duration. The first thing that stands out is that *GDP per capita* level has an opening effect and is statistically significant at 5%. This means that being richer in the onset of a crisis is good in terms of duration. Then, *terms of trade* are statistically significant, but contrary to what expected with a protective effect. The other variables that present statistically significant are *central bank independence* with a high opening effect, and *child mortality* and *country risk index* with protective effects as expected. Moving away from statistical significance, we find that inequality (*Gini index*) has an opening effect, while *unemployment*, as expected, a protective one. Moreover, our indicators for transformation present a mixed picture. As an example, *agriculture share of GDP* presents a small opening effect, while *agriculture share of employment* a small protective effect.

Table 4.3: Survival Analysis variable-by-Variable for Crisis Duration

Variable	Hzd. Ratio	p-value	Episodes	Exits	Time at	log L
Controls						
Log of GDP per capita	**1.288****	(0.025)	100	84	827	-323.6
Avg. GDP pc growth (prev. 5 years)	0.999	(0.983)	100	84	827	-323.6
Net barter terms of trade	**0.991****	(0.024)	67	55	413	-188.3
NNRR rents (% of GDP)	0.974	(0.280)	82	69	684	-249.4
Inclusion						
Gini Index (SWIID)	1.034	(0.111)	80	67	578	-244.2
Unemployment rate	0.969	(0.420)	46	37	207	-115.3
Transformation						
Agriculture share of GDP	0.989	(0.603)	94	81	696	-304.9
Agriculture share of employment	1.003	(0.905)	46	37	207	-115.7
Exports diversification Index	0.837	(0.206)	100	84	827	-322.8
Exports quality Index	1.489	(0.690)	100	84	827	-323.5
Economic complexity Index	0.941	(0.844)	58	49	521	-161.2
State Autonomy						
Log of inflation	1.004	(0.355)	100	84	827	-323.2
Central bank independence Index	**10.705*****	(0.004)	91	77	687	-285.7
Tax revenue (% of GDP)	0.976	(0.415)	63	53	383	-178.3
State Accountability						
Child mortality	**0.985*****	(0.001)	99	83	798	-312.5
Education expenditure (% of GDP)	1.010	(0.903)	75	63	535	-226.1
Access to electricity (% of pop.)	1.006	(0.817)	64	53	275	-186.2
Social Stability						
Country risk Index	**0.570*****	(0.010)	56	48	405	-150.2
Social stability Index	1.353*	(0.052)	56	48	405	-151.8
Institutional quality Index	1.239*	(0.097)	56	48	405	-152.5
Ethnic fractionalization	0.422	(0.132)	100	84	827	-322.5
Linguistic fractionalization	0.600	(0.356)	100	84	827	-323.2

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.4 presents the results for fall duration. Again, here *net barter terms of trade* are statistically significant at 1% with a protective effect. *Natural resources rents* is significant at 10% also with a protective effect. Regarding the social capability covariates, the same covariates present as statistically significant as before and with the same effects. Moreover, *ethnic fractionalization* also presents as statistically significant with a protective effect.

Table 4.4: Survival Analysis variable-by-Variable for Fall Duration

Variable	Hzd. Ratio	p-value	Episodes	Exits	Time at	log L
Controls						
Log of GDP per capita	1.136	(0.199)	100	91	401	-351.1
Avg. GDP pc growth (prev. 5 years)	0.988	(0.833)	100	91	401	-351.1
Net barter terms of trade	**0.990*** **	(0.010)	67	61	213	-209.8
NNRR rents (% of GDP)	0.954*	(0.064)	82	74	331	-268.1
Inclusion						
Gini Index (SWIID)	1.024	(0.224)	80	73	281	-268.2
Unemployment rate	0.997	(0.933)	46	40	109	-128.8
Transformation						
Agriculture share of GDP	0.994	(0.791)	94	87	336	-330.3
Agriculture share of employment	1.000	(0.985)	46	40	109	-128.8
Exports diversification Index	0.873	(0.302)	100	91	401	-350.6
Exports quality Index	2.595	(0.326)	100	91	401	-350.6
Economic complexity Index	1.010	(0.974)	58	51	234	-171
State Autonomy						
Log of inflation	1.002	(0.686)	100	91	401	-351
Central bank independence Index	**7.582*** **	(0.006)	91	84	339	-313.2
Tax revenue (% of GDP)	0.993	(0.786)	63	58	187	-200.4
State Accountability						
Child mortality	**0.986*** **	(0.001)	99	90	383	-341.5
Education expenditure (% of GDP)	1.043	(0.583)	75	68	250	-248.6
Access to electricity (% of pop.)	0.996	(0.847)	64	58	143	-206.6
Social Stability						
Country risk Index	**0.603** **	(0.023)	56	50	194	-162.9
Social stability Index	1.249	(0.142)	56	50	194	-164.6
Institutional quality Index	1.224	(0.122)	56	50	194	-164.5
Ethnic fractionalization	**0.330** **	(0.045)	100	91	401	-349.1
Linguistic fractionalization	0.742	(0.567)	100	91	401	-351

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Finally, Table 4.5 presents the results for the recovery duration. Here we do not get covariates statistically significant at 1% or 5%. Only *agriculture share of GDP* and *child mortality* appear significant at 10% both with a protective effect. It is important to clarify that for this analysis, the values for controls and social capability indicators correspond to the onset of the recovery phase. These values are clearly affected by the decline phase, and it would be interesting to explore the effects of the fall over social capability, but this is not pursued here.

Table 4.5: Survival Analysis variable-by-Variable for Recovery Duration

Variable	Hzd. Ratio	p-value	Episodes	Exits	Time at	log L
Controls						
Log of GDP per capita	1.079	(0.647)	94	84	426	-288.7
Avg. GDP pc growth (prev. 5 years)	**1.245*** **	(0.002)	94	84	426	-288.7
Net barter terms of trade	1.003	(0.631)	69	60	317	-187.3
NNRR rents (% of GDP)	1.018	(0.465)	79	70	394	-228.2
Inclusion						
Gini Index (SWIID)	1.019	(0.473)	79	70	338	-225.6
Unemployment rate	0.985	(0.641)	52	46	207	-133.9
Transformation						
Agriculture share of GDP	0.954*	(0.076)	90	82	380	-277.6
Agriculture share of employment	0.979	(0.346)	52	46	207	-133.6
Exports diversification Index	5.081	(0.308)	94	84	426	-288.2
Exports quality Index	0.232	(0.240)	94	84	426	-288
Economic complexity Index	1.267	(0.503)	54	49	287	-137.4
State Autonomy						
Log of inflation	1.003	(0.409)	94	84	426	-288.4
Central bank independence Index	1.321	(0.721)	88	79	367	-265.8
Tax revenue (% of GDP)	0.961	(0.210)	64	58	261	-178.6
State Accountability						
Child mortality	0.990	(0.123)	94	84	426	-287.5
Education expenditure (% of GDP)	0.899	(0.276)	72	65	269	-212.9
Access to electricity (% of pop.)	1.015	(0.412)	70	62	246	-201.6
Social Stability						
Country risk Index	0.814	(0.343)	58	52	331	-146.8
Social stability Index	1.128	(0.450)	58	52	331	-146.9
Institutional quality Index	1.046	(0.750)	58	52	331	-147.2
Ethnic fractionalization	0.886	(0.836)	94	84	426	-288.7
Linguistic fractionalization	1.353	(0.624)	94	84	426	-288.6

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Now we present "complete" models considering at least one variable for each social capability dimension. The selection of the variables is based on three criteria. First, variables that showed greater statistical significance in the variable-by-variable analysis. Second, variables that, according to our framework, have better theoretical support. Third, variables that provide good combined coverage through time and countries.

Thus, for this complete specification we consider the *Gini index* for inclusion, *agriculture share of GDP, exports diversification index, and exports quality index* for transformation, *log of inflation* and *central bank independence index* for autonomy, *child mortality* for accountability, and the *country risk index* for social stability. We always control for *average GDP per capita growth during the previous five years* and *GDP per capita level*, while in further specifications we also control for other factors

that might account for external conditions or "luck" like *terms of trade* and *natural resources rents*.

Table 4.6 presents the results of the Cox proportional hazard model for crisis, fall, and recovery, as well as the regression for the crisis intensity. Odd columns show models with only social capability factors as covariates, while even columns include controls for *terms of trade*, *natural resources rents*.

Table 4.6: Complete Model for Crisis, Fall, Recovery and Intensity

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
	Crisis		Fall		Recovery		Intensity	
Log of GDP per capita	**0.391****	**0.228****	**0.289*****	**0.210*****	0.929	0.855	-0.043*	**-0.058****
	(0.168)	(0.132)	(0.121)	(0.107)	(0.585)	(0.577)	(0.022)	(0.023)
Avg. GDP pc growth (prev. 5 years)	1.143	1.214*	1.120	1.127	**1.518*****	**1.464****	0.006	0.004
	(0.112)	(0.127)	(0.108)	(0.113)	(0.203)	(0.230)	(0.005)	(0.005)
Gini Index (SWIID)	**1.123*****	**1.126****	**1.075****	1.087*	1.075	1.071	**0.005*****	**0.006*****
	(0.049)	(0.058)	(0.040)	(0.048)	(0.050)	(0.058)	(0.002)	(0.002)
Agriculture share of GDP	1.026	1.016	0.980	0.991	1.082*	1.076	0.002	0.003*
	(0.038)	(0.041)	(0.035)	(0.039)	(0.048)	(0.051)	(0.002)	(0.002)
Exports diversification Index	0.565*	**0.361*****	0.793	0.559*	**4,378*****	**5,898****	-0.011	-0.032*
	(0.169)	(0.136)	(0.216)	(0.194)	(14,181)	(22,694)	(0.019)	(0.018)
Exports quality Index	0.317	7.405	0.804	19.958	0.034	0.262	-0.019	**0.353****
	(0.657)	(22.519)	(1.571)	(57.969)	(0.075)	(0.743)	(0.139)	(0.156)
Central bank independence Index	3.556	3.757	4.653	6.772*	1.359	1.239	0.036	0.052
	(3.723)	(4.232)	(4.964)	(7.659)	(1.363)	(1.303)	(0.048)	(0.046)
Child mortality	**0.967*****	**0.963*****	0.983*	0.978*	**0.967****	**0.970****	**-0.001*****	**-0.002*****
	(0.011)	(0.013)	(0.010)	(0.012)	(0.013)	(0.013)	(0.001)	(0.001)
Country risk Index	0.666	0.565*	0.721	0.707	1.031	1.010	-0.027*	-0.022
	(0.182)	(0.193)	(0.190)	(0.210)	(0.317)	(0.351)	(0.016)	(0.015)
Net barter terms of trade		0.992		0.999		1.002		0.000
		(0.006)		(0.005)		(0.008)		(0.000)
NNRR rents (% of GDP)		**1.124****		1.070		1.042		**0.006****
		(0.064)		(0.056)		(0.059)		(0.003)
Episodes	48	44	48	44	49	46	48	44
Exits	42	38	43	39	46	43	-	-
Time at	291	255	142	130	220	193	-	-
log L	-114.5	-97.45	-129.4	-112.1	-111.9	-104.2	-	-
LR test Chi2	28.86	34.07	20.27	23.51	64.48	57.64	-	-
Pseudo R-squared	0.112	0.149	0.0726	0.0949	0.224	0.217	-	-
R-squared	-	-	-	-	-	-	0.402	0.576

p-values in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Here it is possible to see that GDP per capita level has a consistent protective effect, while previous growth a consistent opening effect. Regarding the social capability covariates, *Gini index* presents a consistent opening effect, statistically significant for crises and falls, while also presenting a positive effect over the intensity of the crisis. *Agriculture share of GDP* presents a minor opening effect over crises as recoveries and

a small protective effect over falls. *Exports diversification* present a protective effect over crisis and falls and a significant and large opening effect over recoveries. *Central bank independence* present a consistent opening effect across durations, while *child mortality* presents a consistently protective one, often statistically significant. Finally, *country risk* presents a protective effect over crises and falls, although only not statistically significant. All in all, the hazard ratios from our complete models largely coincide, at least in the direction with those found in the variable-by-variable analyses.

4.3.2. International Crises Analysis

The main purpose of our second approach is to explore how social capability might help to explain the differences in performance of Latin American countries during times of international crisis. For this, we explore how countries fared during the last three major crises that have hit the region, namely the debt crisis of the 1980s, the Asian crisis of the late 1990s, and the great financial crisis of the late 2000s, following two different strategies. First, we just look for the relation between the average growth and the number of negative growth years during the next five years after the crisis onset. Second, we perform a first-difference analysis to specifically find what could explain the better performance during the last crisis with respect to the previous two.

As in the previous section, we begin our analysis here with a variable-by-variable analysis for average growth and the first-difference analysis. Results are presented in Table 4.7 and Table 4.8, respectively. In the absolute analysis side, we find that, as expected, results mirror between our two dependent variables (average growth and years of shrinking). Thus, we will only comment on average growth results.

In terms of *inclusion*, *the Gini index* shows a positive relationship with growth, while unemployment a negative one, although in both cases, the coefficient is not statistically different from zero. Regarding *transformation*, no indicator is statistically significant. While *agriculture share of GDP* shows the expected negative relationship with growth, all the other indicators show the opposite. *Exports diversification* and *quality*, and *economic complexity* show a negative relation with growth. In terms of *autonomy*, *central bank independence* shows a strong a significant positive relationship with growth, and *inflation* a negative but not significant one.

Regarding accountability, *child mortality* shows a strong and statistically significant negative relation with growth, while both *access to electricity* and *educational expenditure* a positive, although a not significant one. Finally, regarding *social stability*, we find that the *country risk* indicator shows a strong and statistically significant relation with growth. Moreover, our indicators of *institutional quality* and *social stability* present the expected positive relationship, the former also being statistically significant.

Table 4.7: Variable by Variable for Absolute Analysis

Variable	Average Growth				Years of Shrinking			
	Coef.	SE	Obs.	R^2	Coef.	SE	Obs.	R^2
Controls								
Log of GDP per capita	0.237	(0.282)	94	0.072	-0.061	(0.205)	89	0.042
Avg. GDP pc growth (prev. 5 years)	**0.219****	(0.083)			-0.093*	(0.054)	89	0.042
Net barter terms of trade	**-0.010****	(0.005)	71	0.143	0.005	(0.003)	56	0.143
NNRR rents (% of GDP)	-0.069*	(0.040)	85	0.130	0.019	(0.022)	80	0.079
Inclusion								
Gini Index (SWIID)	0.009	(0.087)	80	0.033	-0.029	(0.035)	63	0.090
Unemployment rate	-0.072	(0.053)	58	0.140	0.048	(0.034)	29	0.199
Transformation								
Agriculture share of GDP	-0.071	(0.054)	89	0.087	**0.061****	(0.030)	79	0.052
Agriculture share of employment	0.021	(0.041)	58	0.121	0.006	(0.021)	29	0.143
Exports diversification Index	-0.550	(3.991)	94	0.072	0.849	(2.045)	89	0.098
Exports quality Index	-1.967	(3.591)	94	0.078	0.450	(1.661)	89	0.042
Economic complexity Index	-0.522	(0.671)	60	0.162	0.039	(0.455)	60	0.067
State Autonomy								
Log of inflation	-0.011	(0.010)	94	0.091	0.004	(0.004)	89	0.049
Central bank independence Index	**3.949*****	(1.344)	88	0.128	**-2.288*****	(0.817)	77	0.224
Tax revenue (% of GDP)	-0.029	(0.094)	55	0.017	0.022	(0.037)	37	0.125
State Accountability								
Child mortality	**-0.041*****	(0.007)	93	0.241	**0.026*****	(0.004)	87	0.218
Education expenditure (% of GDP)	0.293	(0.200)	76	0.136	-0.149*	(0.082)	61	0.043
Access to electricity (% of pop.)	0.025	(0.025)	65	0.101	-0.018	(0.015)	32	0.094
Social Stability								
Country risk Index	**-0.994*****	(0.311)	75	0.208	**0.447****	(0.202)	75	0.136
Social stability Index	0.429	(0.291)	75	0.159	-0.212	(0.165)	62	0.111
Institutional quality Index	**0.721*****	(0.257)	75	0.216	**-0.333****	(0.139)	62	0.116
Ethnic fractionalization	2.478*	(1.259)	94	0.109	-	-	-	-
Linguistic fractionalization	1.001	(1.306)	94	0.078	-	-	-	-

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Results of our first-difference analysis do not differ much from the absolute analysis. The only difference worthwhile remarking however here is that *exports diversification index* is highly related to better performance.

Table 4.8: Variable by Variable for First-Difference Analysis

Variable	Coef.	SE	Obs.	R-squared
Controls				
Log of GDP per capita	-0.216	(0.987)	89	0.042
Avg. GDP pc growth (prev. 5 years)	**0.180****	(0.078)	89	0.042
Net barter terms of trade	-0.002	(0.003)	56	0.143
NNRR rents (% of GDP)	-0.100	(0.078)	80	0.079
Inclusion				
Gini Index (SWIID)	-0.053	(0.158)	63	0.090
Unemployment rate	**0.258****	(0.105)	29	0.199
Transformation				
Agriculture share of GDP	-0.080	(0.058)	79	0.052
Agriculture share of employment	0.038	(0.107)	29	0.143
Exports diversification Index	**19.225****	(9.665)	89	0.098
Exports quality Index	-0.859	(5.019)	89	0.042
Economic complexity Index	-0.132	(0.906)	60	0.067
State Autonomy				
Log of inflation	-0.007	(0.005)	89	0.049
Central bank independence Index	**9.677*****	(2.057)	77	0.224
Tax revenue (% of GDP)	-0.253	(0.178)	37	0.125
State Accountability				
Child mortality	**-0.048*****	(0.009)	87	0.218
Education expenditure (% of GDP)	-0.115	(0.302)	61	0.043
Access to electricity (% of pop.)	-0.085	(0.146)	32	0.094
Social Stability				
Country risk Index	**-0.854*****	(0.299)	75	0.136
Social stability Index	0.146	(0.254)	62	0.111
Institutional quality Index	-0.163	(0.181)	62	0.116

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Table 4.9 now presents the results for the complete models considering the same set of variables than in the previous analysis to characterize all social capability dimensions. Columns 1 and 2 simply present the results for the average growth rate during the next five years since the onset of the crisis. Columns 3 and 4 present the results for the number of shrinking years during the next five years since the onset of the crisis. Finally, columns 5 and 6 resent the first-difference analysis with differential average growth rates as the dependent variable. Odd columns present the specification without controls, while even columns present the specification with controls.

Regarding the results of the absolute analysis, in general, we find that the statistically significant variables are *Gini index*, *inflation*, and *child mortality*. This stands for our two dependent variables, *average growth* and *shrinking years*, with the opposite sign as expected. Gini index presents a positive relation with average growth, while inflation and child mortality present a negative relationship. *Exports diversification* comes close

to being significant and shows a positive relation. Finally, the *level of GDP per capita* before the crisis is always highly significant and has a positive relationship with growth, while average GDP growth before the crisis is also highly significant in the settings with controls and with a positive relationship with growth. Overall, we achieve fairly high levels of R-squared, implying that a large proportion of the variance is explained by our models.

In our first-difference analysis, *previous average growth*, *exports diversification*, and *exports quality* are significant at 5% and with a positive relation. However, when including controls only *GDP per capita* level, both turn not significant, and *exports quality* even changes direction. This might very well be because the number of observations drops to only 34 and 43 with and without controls, respectively this last setting. All in all, we find little coincidence between the variable-by-variable analysis and the complete models in terms of statistical significance, magnitude, and even direction of several relations.

Table 4.9: Growth, Shrinking, and Social Capability in Periods of Crisis

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Avg. GDP pc Growth		Years of Shrinking		First- Difference Avg. GDP pc Growth	
Log of GDP per capita	**-1.667****	**-1.368****	**1.252****	**1.457*****	-3.036*	0.828
	(0.829)	(0.634)	(0.543)	(0.407)	(1.689)	(2.476)
Avg. GDP pc growth (prev. 5 years)	0.237*	**0.356*****	-0.104	**-0.168****	**0.439****	0.150
	(0.122)	(0.103)	(0.066)	(0.063)	(0.190)	(0.247)
Gini Index (SWIID)	**0.202*****	**0.258*****	**-0.114*****	**-0.141*****	-0.054	0.008
	(0.059)	(0.066)	(0.029)	(0.032)	(0.338)	(0.351)
Agriculture share of GDP	-0.039	0.026	0.047	0.026	-0.164	0.139
	(0.062)	(0.045)	(0.033)	(0.032)	(0.190)	(0.162)
Exports diversification Index	4.389	4.327	-1.422	-3.215*	**30.031****	6.771
	(3.460)	(3.226)	(2.248)	(1.877)	(12.012)	(14.784)
Exports quality Index	-1.204	-4.063	-0.596	0.122	**14.426****	-6.042
	(3.645)	(4.181)	(1.981)	(2.622)	(6.625)	(10.583)
Log of Inflation	**-0.018****	-0.013*	**0.010*****	**0.009*****	-0.010	-0.001
	(0.008)	(0.007)	(0.003)	(0.003)	(0.010)	(0.009)
Central bank independence Index	0.244	2.017	-0.412	-1.251	4.207	2.447
	(1.769)	(1.495)	(0.778)	(0.851)	(4.686)	(4.517)
Child mortality	**-0.056*****	**-0.043*****	**0.037*****	**0.035*****	-0.019	-0.015
	(0.014)	(0.013)	(0.008)	(0.009)	(0.027)	(0.029)
Social stability Index	-0.597	-0.628	0.340	0.412*	0.037	-0.197
	(0.572)	(0.404)	(0.251)	(0.225)	(0.456)	(0.464)
Institutional quality Index	0.508	1.131*	-0.376	-0.583	-0.318	-0.042
	(0.586)	(0.628)	(0.367)	(0.411)	(0.369)	(0.227)
Country risk Index	-0.119	0.191	-0.201	-0.188	0.079	-0.460
	(0.971)	(0.958)	(0.617)	(0.649)	(0.590)	(0.545)
Net barter terms of trade		0.001		-0.001		0.006
		(0.006)		(0.004)		(0.011)
NNRR Rents (% of GDP)		-0.058		-0.002		-0.004
		(0.066)		(0.033)		(0.115)
Observations	61	54	61	54	43	34
R-squared	0.425	0.719	0.454	0.652	0.469	0.635

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4. Robustness Analysis

This section presents some robustness analyses performed for the empirical approaches discussed above.

4.4.1. Shrinking Episodes Analysis

There are three usual ways to test for robustness in survival analysis. The first is to analyze what is called the "goodness of fit", meaning whether our models explain a large share of the variation of durations (Berg, Ostry & Zettelmeyer, 2012). For this, we check the statistical performance of our full models against some with very little covariates or just the basic controls (Table 4.10). The higher log-likelihood values (less negative) imply that the full models fit the data better than the simpler versions. The Chi^2 statistics values indicate that we can "reject the full set of zero restrictions implicit in the smaller models" (Berg, Ostry & Zettelmeyer, 2012, p.161). Finally, the higher pseudo R^2 values we obtain for full models compared to simpler versions point in the same direction.

Table 4.10: Goodness of Fit

Model	log L	LR test Chi2	Pseudo R-squared
Crisis			
Full Model, Table 4.5	-97.03	34.90	0.152
Only GDP level and growth	-323.6	5.08	0.008
Fall			
Full Model, Table 4.5	-111.7	24.28	0.098
Only GDP level and growth	-351.1	1.73	0.002
Recovery			
Full Model, Table 4.5	-103.5	59.08	0.222
Only GDP level and growth	-288.7	67.27	0.104

A second way to test for robustness consists of experimenting with alternative distribution functions for the duration of growth. This is, in fact, the strategy followed by Berg et al. (2012), Bluhm et al. (2013), and Hausmann et al. (2006). For this, parametric models must be used and check whether the results hold different distributional forms. We test this for Weibull, Gompertz, exponential, log-normal, and log-logistic distributions only for crisis duration, and results are presented in Table 4.11. Since log-normal and log-logistic distributions do not fit proportional hazards models, we have to fit them into an accelerated failure-time (AFT) formulation, where hazard

have a different meaning. Thus, we report the coefficients that should be read in relation to duration of the crisis. A negative coefficient means that higher values of the related variable shorten the duration until the event. In our case the end of a period of crisis, fall or recovery. A positive coefficient means that higher values of the related variable prolong the duration until the event (Bluhm, de Crombrugghe & Szirmai, 2013). Therefore, all in all, we can see that results hold across different distribution functions.

Table 4.11: Robustness to Functional Forms

Variables	(1) Cox	(2) Weibull	(3) Gompertz	(4) Exponential	(5) Log-logistic	(6) Log-normal
	Hazard Ratios				Coefficients	
Log of GDP per capita	**0.391****	**0.442****	**0.433****	0.529	**0.413****	**0.438****
	(0.168)	(0.180)	(0.173)	(0.210)	(0.209)	(0.219)
Avg. GDP pc growth (prev. 5 years)	1.143	1.162	1.129	1.091	-0.075	-0.080
	(0.112)	(0.117)	(0.109)	(0.100)	(0.047)	(0.049)
Gini Index (SWIID)	**1.123*****	**1.155*****	**1.154*****	**1.077****	**-0.078*****	**-0.068*****
	(0.049)	(0.050)	(0.049)	(0.040)	(0.018)	(0.019)
Agriculture share of GDP	1.026	1.027	1.037	1.009	-0.021	-0.017
	(0.038)	(0.038)	(0.039)	(0.034)	(0.018)	(0.018)
Exports diversification Index	0.565*	0.579*	**0.536****	0.731	0.250*	0.208
	(0.169)	(0.163)	(0.159)	(0.195)	(0.129)	(0.131)
Exports quality Index	0.317	0.039	0.095	0.220	1.146	1.769*
	(0.657)	(0.087)	(0.194)	(0.438)	(0.986)	(0.967)
Central bank independence Index	3.556	8.822*	7.557*	2.619	-0.528	-0.420
	(3.723)	(10.538)	(8.517)	(2.589)	(0.463)	(0.474)
Child mortality	**0.967*****	**0.970*****	**0.965*****	**0.983***	**0.021*****	**0.020*****
	(0.011)	(0.010)	(0.010)	(0.009)	(0.005)	(0.005)
Country risk Index	0.666	0.623*	0.664	0.805	0.106	0.126
	(0.182)	(0.165)	(0.166)	(0.205)	(0.153)	(0.144)
ln p (Weibull)		**2.043*****				
		(0.238)				
ϒ (Gompertz)			**1.243*****			
			(0.059)			
ln ϒ (Log-logistic)					**-1.162*****	
					(0.128)	
ln σ (Log-normal)						**-0.597*****
						(0.110)
Episodes	48	48	48	48	48	48
Exits	42	42	42	42	42	42
Time at	291	291	291	291	291	291
log L	-114.5	-38.98	-41.44	-52.13	-37.99	-37.66
LR test Chi2	28.86	40.25	38.16	18.60	38.89	35.45

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Finally, we ought to test for unobserved heterogeneity and omitted variables. First, we formally test the proportional hazards assumption. This is nothing else than a model specification test where we verify whether we have adequately parametrized the model

and chosen a proper specification of $X\beta_x$ (Cleves et al., 2010). Results suggest that our specification is adequate.

This test does not put the bar very high, though; thus, we explore further. A first alternative approach is to look for the presence of unobserved heterogeneity or "frailty". We run parametric models with Weibull and log-normal distributions without and with frailty, and the results are shown in Table 4.12. We can see that the results do not change at all, which is a signal that are not be in the presence of unobserved heterogeneity.

Table 4.12: Robustness to Frailty

Variables	**(1)**	**(2)**	**(3)**	**(4)**
	Weibull		**Log-normal**	
	No Frailty	**Frailty**	**No Frailty**	**Frailty**
Log of GDP per capita	**0.442****	**0.442****	**0.438****	**0.438****
	(0.180)	(0.180)	(0.219)	(0.219)
Avg. GDP pc growth (prev. 5 years)	1.162	1.162	-0.080	-0.080
	(0.117)	(0.117)	(0.049)	(0.049)
Gini Index (SWIID)	**1.155*****	**1.155*****	**-0.068*****	**-0.068*****
	(0.050)	(0.050)	(0.019)	(0.019)
Agriculture share of GDP	1.027	1.027	-0.017	-0.017
	(0.038)	(0.038)	(0.018)	(0.018)
Exports diversification Index	0.579*	0.579*	0.208	0.208
	(0.163)	(0.163)	(0.131)	(0.131)
Exports quality Index	0.039	0.039	1.769*	1.769*
	(0.087)	(0.087)	(0.967)	(0.967)
Central bank independence Index	8.822*	8.823*	-0.420	-0.420
	(10.538)	(10.539)	(0.474)	(0.474)
Child mortality	**0.970*****	**0.970*****	**0.020*****	**0.020*****
	(0.010)	(0.010)	(0.005)	(0.005)
Country risk Index	0.623*	0.623*	0.126	0.126
	(0.165)	(0.165)	(0.144)	(0.144)
ln p (Weibull)	**2.043*****	**2.043*****		
	(0.238)	(0.238)		
ln σ (Log-normal)			**-0.597*****	**-0.597*****
			(0.110)	(0.110)
ln θ		0.000		-16.312
		(0.000)		-1,047
Groups (countries)	20	20	20	20
Episodes	48	48	48	48
Exits	42	42	42	42
Time at	291	291	291	291
log L	-38.98	-38.98	-37.66	-37.66
LR test Chi2	40.25	40.25	35.45	35.45

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The second strategy is to look for omitted variables. The time distribution of shrinking episodes presented above suggests that including dummy variables for each decade indicating the beginning of the crisis could be the right choice. Table 4.13 shows the models without controls with and without decadal dummies. Decadal dummies for the 1980s, 1990s, and 2000s are highly significant, and coefficients change little with or without dummies. Also, levels of statistical significance hold almost for every coefficient.

Table 4.13: Robustness to Omitted Variables (Decadal Dummies)

Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
	Crisis		**Fall**		**Recovery**	
Log of GDP per capita	0.514	**0.391****	**0.369****	**0.289*****	0.955	0.929
	(0.226)	(0.168)	(0.162)	(0.121)	(0.618)	(0.585)
Avg. GDP pc growth (prev. 5 years)	1.165	1.143	1.120	1.120	**1.498*****	**1.518*****
	(0.133)	(0.112)	(0.122)	(0.108)	(0.208)	(0.203)
Gini Index (SWIID)	**1.111****	**1.123*****	1.056	**1.075****	1.071	1.075
	(0.055)	(0.049)	(0.043)	(0.040)	(0.053)	(0.050)
Agriculture share of GDP	1.031	1.026	0.987	0.980	1.079*	1.082*
	(0.040)	(0.038)	(0.037)	(0.035)	(0.048)	(0.048)
Exports diversification Index	**0.540****	**0.565***	0.736	0.793	**3,017****	**4,378*****
	(0.164)	(0.169)	(0.200)	(0.216)	(10,204)	(14,180)
Exports quality Index	0.035	0.317	0.177	0.804	0.036	0.034
	(0.083)	(0.657)	(0.364)	(1.571)	(0.080)	(0.075)
Central bank independence Index	1.599	3.556	2.127	4.653	1.394	1.359
	(1.941)	(3.723)	(2.473)	(4.964)	(1.549)	(1.363)
Child mortality	**0.972****	**0.967*****	0.987	0.983*	**0.968****	**0.967****
	(0.013)	(0.011)	(0.012)	(0.010)	(0.014)	(0.013)
Country risk Index	0.889	0.666	0.995	0.721	0.995	1.031
	(0.276)	(0.182)	(0.304)	(0.190)	(0.314)	(0.317)
Net barter terms of trade		0.993		1.001		1.005
		(0.007)		(0.006)		(0.009)
NNRR rents (% of GDP)		1.104		1.039		1.040
		(0.072)		(0.061)		(0.060)
Peak-bottom ratio					546*	439
					(2,066)	(1,625)
Decadal dummies	**Yes**	**No**	**Yes**	**No**	**Yes**	**No**
Episodes	48	48	48	48	49	49
Exits	42	42	43	43	46	46
Time at	291	291	142	142	220	220
log L	-112	-114.5	-126.4	-129.4	-111.4	-111.9
LR test Chi2	33.92	28.86	26.37	20.27	65.52	64.48
Pseudo R-squared	0.132	0.112	0.0945	0.0726	0.227	0.224

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.4.2. International Crises Analysis

We have tested for heteroscedasticity and multicollinearity and find no or little evidence of neither (the variance inflation factor (vif) is around 5.1 for some models). Moreover, our results on Table 4.9 hold when we control for terms of trade and natural resources rents However, we further look for omitted variables, and here the obvious choice is to include crisis dummies (DC, AC, and GFC) for the absolute analysis, and pair of crises dummies (DC-AC, DC-GFC, and AC-GFC) for the first-difference analysis. Table 4.13 presents the models without controls with and without these dummies. We find that all direction, magnitudes, and levels of statistical significance hold almost for every coefficient.

Table 4.14: Robustness to Omitted Variables (Crises Dummies)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
	Avg. GDP pc Growth		Years of Shrinking		First- Difference Avg. GDP pc Growth	
Log of GDP per capita	**-1.667****	**-1.587***	**1.252****	**1.203****	-3.036*	**-5.459*****
	(0.829)	(0.846)	(0.543)	(0.538)	(1.689)	(1.781)
Avg. GDP pc growth (prev. 5 years)	0.237*	**0.325****	-0.104	**-0.152****	**0.439****	**0.430****
	(0.122)	(0.131)	(0.066)	(0.069)	(0.190)	(0.194)
Gini Index (SWIID)	**0.202*****	**0.115**	**-0.114*****	**-0.085****	-0.054	-0.035
	(0.059)	(0.071)	(0.029)	(0.034)	(0.338)	(0.341)
Agriculture share of GDP	-0.039	-0.045	0.047	0.051	-0.164	-0.064
	(0.062)	(0.062)	(0.033)	(0.034)	(0.190)	(0.174)
Exports diversification Index	4.389	3.182	-1.422	-0.891	**30.031****	30.844*
	(3.460)	(3.672)	(2.248)	(2.313)	(12.012)	(15.617)
Exports quality Index	-1.204	0.114	-0.596	-1.104	**14.426****	10.778
	(3.645)	(3.179)	(1.981)	(1.833)	(6.625)	(7.519)
Log of Inflation	**-0.018****	-0.015*	**0.010*****	**0.010*****	-0.010	-0.005
	(0.008)	(0.008)	(0.003)	(0.004)	(0.010)	(0.010)
Central bank independence Index	0.244	-1.796	-0.412	0.229	4.207	3.351
	(1.769)	(1.758)	(0.778)	(0.802)	(4.686)	(4.348)
Child mortality	**-0.056*****	**-0.033****	**0.037*****	**0.027*****	-0.019	-0.014
	(0.014)	(0.016)	(0.008)	(0.009)	(0.027)	(0.033)
Social stability Index	-0.597	-0.367	0.340	0.234	0.037	-0.141
	(0.572)	(0.499)	(0.251)	(0.240)	(0.456)	(0.331)
Institutional quality Index	0.508	0.490	-0.376	-0.444	-0.318	-0.341
	(0.586)	(0.552)	(0.367)	(0.378)	(0.369)	(0.280)
Country risk Index	-0.119	0.167	-0.201	-0.396	0.079	0.317
	(0.971)	(0.902)	(0.617)	(0.641)	(0.590)	(0.455)
Crisis dummy	No	Yes	No	Yes	No	Yes
Observations	61	61	61	61	42	42
R-squared	0.425	0.499	0.455	0.489	0.464	0.568

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Moreover, we include country fixed-effects to the absolute analysis models in order to test for unobserved heterogeneity. Results are presented in Table 4.15 and we can see that although the direction of the coefficients in general hold, there are large changes in magnitudes and statistical significance. Thus signaling that we are in presence of unobserved heterogeneity between countries.

Table 4.15: Robustness to Country Fixed-Effects

Variables	(1)	(2)	(3)	(4)
	Avg. GDP pc Growth		Years of Shrinking	
	RE	FE	RE	FE
Log of GDP per capita	**-1.667****	-2.802*	**1.252*****	1.064
	(0.806)	(1.632)	(0.417)	(0.929)
Avg. GDP pc growth (prev. 5 years)	0.237**	0.430*	-0.104*	-0.156
	(0.116)	(0.213)	(0.054)	(0.121)
Gini Index (SWIID)	**0.202*****	-0.011	**-0.114*****	-0.084
	(0.047)	(0.234)	(0.029)	(0.133)
Agriculture share of GDP	-0.039	-0.185	0.047*	0.054
	(0.048)	(0.143)	(0.027)	(0.082)
Exports diversification Index	4.389	**28.887****	-1.422	-12.899*
	(3.065)	(12.933)	(2.063)	(7.363)
Exports quality Index	-1.204	14.317*	-0.596	-2.738
	(3.816)	(7.642)	(1.884)	(4.350)
Log of Inflation	**-0.018****	-0.012	**0.010*****	0.008
	(0.008)	(0.011)	(0.003)	(0.007)
Central bank independence Index	0.244	4.153	-0.412	-1.459
	(1.420)	(4.725)	(0.759)	(2.690)
Child mortality	**-0.056*****	-0.041	**0.037*****	0.029*
	(0.013)	(0.029)	(0.008)	(0.016)
Social stability Index	-0.597	-0.255	0.340	-0.316
	(0.383)	(0.950)	(0.268)	(0.541)
Institutional quality Index	0.508	1.663	-0.376	-0.447
	(0.398)	(1.072)	(0.259)	(0.610)
Country risk Index	-0.119	1.981	-0.201	-1.200
	(0.687)	(1.866)	(0.583)	(1.063)
Observations	61	61	61	61
R-squared	-	0.584	-	0.504
Number of country	25	25	25	25

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Finally, we test whether our results are driven by one specific crisis. Therefore, in Table 4.16 we compare the coefficients from our basic regression of *average GDP growth* with no controls (column 1 in Table 4.9) with three specification each one omitting

observations from one crisis. We find that coefficients largely hold, however, some levels of significance do not.

Table 4.16: Sensitivity Analysis to Crises

Variables	(1) All	(2) No DC	(3) No AC	(4) No GFC
	Avg. GDP pc Growth			
Log of GDP per capita	**-1.667****	-1.777*	**-0.932**	-2.140
	(0.829)	(0.957)	(0.715)	(1.909)
Avg. GDP pc growth (prev. 5 years)	0.237*	0.231	0.223	0.133
	(0.122)	(0.160)	(0.136)	(0.212)
Gini Index (SWIID)	**0.202*****	0.170**	**0.274*****	0.148*
	(0.059)	(0.076)	(0.063)	(0.082)
Agriculture share of GDP	-0.039	-0.105	0.056	-0.074
	(0.062)	(0.076)	(0.058)	(0.097)
Exports diversification Index	4.389	1.728	6.790*	4.403
	(3.460)	(3.975)	(3.378)	(8.180)
Exports quality Index	-1.204	-2.671	-4.113	1.720
	(3.645)	(4.579)	(3.088)	(4.526)
Log of Inflation	**-0.018****	**-0.016****	-0.012	-0.013
	(0.008)	(0.008)	(0.019)	(0.010)
Central bank independence Index	0.244	-1.646	2.411	-0.897
	(1.769)	(1.786)	(1.969)	(2.775)
Child mortality	**-0.056*****	**-0.044****	**-0.049*****	**-0.054****
	(0.014)	(0.018)	(0.013)	(0.022)
Social stability Index	-0.597	-0.867	-0.209	-0.627
	(0.572)	(0.584)	(0.499)	(0.846)
Institutional quality Index	0.508	1.715	0.214	0.096
	(0.586)	(1.109)	(0.548)	(0.796)
Country risk Index	-0.119	1.229	-0.452	-0.614
	(0.971)	(1.391)	(0.960)	(1.450)
Observations	61	49	36	37
R-squared	0.425	0.385	0.756	0.287

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

4.5. Discussion

In this section, we comment on the results presented above in the context of our theoretical framework and the related literature.

4.5.1. Shrinking Episodes Analysis

To be able to comment on this issue properly, in Table 4.17, we present a summary of the results obtained. We indicate what the expected relation for each variable and the actual relationship on both the variable-by-variable analyses and the complete models.

Regarding *inclusion*, the *Gini Index* presents consistently an unexpected opening effect overall duration in all settings, while also being related to less acute crises. This goes directly against our hypothesis that more inclusive societies would fare better in episodes of shrinking: more equality seems related to longer and more intense crises. Moreover, the limited evidence we have for *unemployment* is not conclusive as it presents an opening effect over crises, a protective effect over falls and recoveries, and a negative relation with intensity.

In terms of *transformation*, all our indicators present a mixed picture. For example *agriculture share of GDP* presents a protective effect in the variable-by-variable models, but an opening effect on complete ones. Moreover, despite having five indicators for this dimension, they almost never turn statistically significant. All considered there is not sufficient evidence to support the idea that *transformation* has an opening effect over durations or intensity.

Concerning *state autonomy*, contrary to our expectations, *inflation* seems to have a consistent opening, although it never turns statistically significant. Nevertheless, *central bank independence*, presents a consistent opening, and often significant, effect according to our expectations. This could be signaling that independent central banks with a specific mandate, despite having less flexibility and being armed with fewer tools to help a country out of a crisis, have been important for countries of the region to shorten periods of economic downturn. Moreover, this also seems to correlate with less severe crises in terms of our peak-bottom ratio. However, our combination of indicators make it difficult to state conclusively that *state autonomy* is related to shorter and less intense crises.

Regarding *state accountability* and *social stability*, our results are probably the most straightforward and in agreement with our initial expectations both regarding duration and intensity. Therefore, we could say that *state accountability* and *social stability* have both been good to shorten crises and make them less intense. Furthermore, our measure

of fractionalization, in agreement with the literature, present a consistent protective effect over durations and a negative relation with intensity.

Table 4.17: Summary of Survival Analysis Results

Variable	Durations Analysis							Intensity Analysis		
	Expected Effect	Crisis		Fall		Recovery		Expected Sign	VbV Models	Complete Models
		VbV Models	Complete Models	VbV Models	Complete Models	VbV Models	Complete Models			
Inclusion										
Gini Index (SWIID)	**Protect**	Open	**Open**	Open	**Open**	Open	Open	(-)	**(+)**	**(+)**
Unemployment rate	**Protect**	Open	/	Protect	/	Protect	/	(-)	(-)	/
Transformation										
Agriculture share of GDP	**Protect**	Protect	Open	Protect	Open	Protect	Open	(-)	(+)	(+)
Agriculture share of employment	**Protect**	Open	/	Protect	/	Protect	/	(-)	(+)	/
Exports diversification Index	**Open**	Protect	**Protect**	Protect	Protect	Protect	**Open**	(+)	(-)	(-)
Exports quality Index	**Open**	Open	Protect	Open	Protect	Open	Protect	(+)	(+)	**(+)**
Economic complexity Index	**Open**	Protect	/	Open	/	Open	/	(+)	(-)	/
State Autonomy										
Log of inflation	**Protect**	Open	/	Open	/	Open	/	(-)	(-)	/
Central bank independence Index	**Open**	**Open**	Open	**Open**	Open	Open	Open	(+)	**(+)**	(+)
Tax revenue (% of GDP)	**Open**	Protect	/	Protect	/	Protect	/	(+)	(-)	/
State Accountability										
Child mortality	**Protect**	**Protect**	**Protect**	**Protect**	**Protect**	Protect	Protect	(-)	**(-)**	(-)
Education expenditure (% of GDP)	**Open**	Open	/	Open	/	Protect	/	(+)	(+)	/
Access to electricity (% of pop.)	**Open**	Open	/	Protect	/	Open	/	(+)	(+)	/
Social Stability										
Country risk Index	**Protect**	**Protect**	Protect	Protect	Protect	Protect	Protect	(-)	**(-)**	(-)
Social stability Index	**Open**	Open	/	Open	/	Open	/	(+)	(+)	/
Institutional quality Index	**Open**	Open	/	Open	/	Open	/	(+)	(+)	/
Ethnic fractionalization	**Protect**	Protect	/	Protect	/	Protect	/	(-)	(-)	/
Linguistic fractionalization	**Protect**	Protect	/	Protect	/	Open	/	(-)	(-)	/
Controls										
Net barter terms of trade	**Open**	**Protect**	Protect	**Protect**	Protect	Open	Protect	(+)	(-)	(+)
NNRR rents (% of GDP)	**Open**	Protect	**Open**	Protect	**Open**	Open	Open	(+)	(-)	(+)

Note: Bold and green-shade indicate significance at 5%

4.5.2. International Crisis Analysis

As in the previous section, Table 4.18 presents a summary of the results of this analysis. Regarding *inclusion*, *Gini index* presents consistently the inverted relation with respect to what we expected to find. In this sense, it seems to be the case that less inclusive countries were able to transit better the periods of global turbulence both in terms of average growth and in terms of the number of years of negative growth.

In terms of *transformation,* we can see that *agriculture share of GDP* shows the expected sign consistently, despite being not statistically significant in all cases. The rest of the indicators present mixed evidence, although, in the first-difference analysis, both *exports diversification* and *exports quality* seem to be relevant in explaining the better performance between crises.

Concerning *state autonomy*, both inflation and *central bank independence* present the expected sign and are often statistically significant. The limited evidence we have for *tax revenue* goes against our expectations, presenting a negative relation, although statistically non-significant. However, it seems safe to say that greater *autonomy* appears to be related to better performance, and more resilience to shrinking, in times of crisis.

State accountability this time also presents consistent picture. In the variable-by-variable analysis, all indicators show the expected sign, and *child mortality* is statistically significant. Furthermore, this translates to the rest of the analyses. Thus, it appears that greater *accountability* is also related to faring better in times of crisis.

Finally, in terms of *social stability*, the whole picture is again consistent with our expectations, much more in the variable-by-variable models than in the complete ones, however. This could be attributable to the drop in observations registered in the complete models, in particular for the first difference analysis.

Table 4.18: Summary of International Crisis Analysis Results

Variable	GDP pc Growth			First-Difference			Shrink Years		
	Expected Effect	VbV Models	Complete Models	Expected Effect	VbV Models	Complete Models	Expected Effect	VbV Models	Complete Models
Inclusion									
Gini Index (SWIID)	(-)	(+)	**(+)**	(-)	(-)	(-)	(+)	(-)	**(-)**
Unemployment rate	(-)	(-)	/	(-)	**(+)**	/	(+)	(+)	/
Transformation									
Agriculture share of GDP	(-)	(-)	(-)	(-)	(-)	(-)	(+)	**(+)**	(+)
Agriculture share of employment	(-)	(+)	/	(-)	(+)	/	(+)	(+)	/
Exports diversification Index	(+)	(-)	(+)	(+)	**(+)**	**(+)**	(-)	(+)	(-)
Exports quality Index	(+)	(-)	(-)	(+)	(-)	**(+)**	(-)	(+)	(-)
Economic complexity Index	(+)	(-)	(-)	(+)	(-)	/	(-)	(+)	/
State Autonomy									
Log of inflation	(-)	(-)	**(-)**	(-)	(-)	(-)	(+)	(+)	**(+)**
Central bank independence Index	(+)	**(+)**	(+)	(+)	**(+)**	(+)	(-)	**(-)**	(-)
Tax revenue (% of GDP)	(+)	(-)	/	(+)	(-)	/	(-)	(+)	/
State Accountability									
Child mortality	(-)	**(-)**	**(-)**	(-)	**(-)**	(-)	(+)	**(+)**	**(+)**
Education expenditure (% of GDP)	(+)	(+)	/	(+)	(-)	/	(-)	(-)	/
Access to electricity (% of pop.)	(+)	(+)	/	(+)	(-)	/	(-)	(-)	/
Social Stability									
Country risk Index	(-)	**(-)**	(-)	(-)	**(-)**	(+)	(+)	**(+)**	(-)
Social stability Index	(+)	(+)	(-)	(+)	(+)	(+)	(-)	(-)	(+)
Institutional quality Index	(+)	**(+)**	(+)	(+)	(-)	(-)	(-)	**(-)**	(-)
Ethnic fractionalization	(-)	(+)	/	(-)	/	/	/	/	/
Linguistic fractionalization	(-)	(+)	/	(-)	/	/	/	/	/
Controls									
Net barter terms of trade	(+)	**(-)**	(+)	(+)	(-)	/	(-)	(+)	(-)
NNRR rents (% of GDP)	(+)	(-)	(+)	(+)	(-)	/	(-)	(+)	(-)

Note: Bold and green-shade indicate significance at 5%

4.5.3. Rounding Up

All in all, our analysis is only able to support the "predictions" of our theoretical framework partially, and we are not in a position to validate our expectations entirely. The relation between shrinking and social capability has proven to be an intricate one, and more research is required to untangle it. Moreover, let's not forget that we have approached the subject of resilience to economic shrinking from different angles – durations, intensity, and responses to international crises – and it is not all that surprising that different aspects of social capability had disparate effects over them. However, our findings are consistent and hold across the different analyses.

In the first place, we find that – at least according to our main indicator, the *Gini index* – *inclusion* has opening effects over the duration of crises, falls and recoveries, which goes against the findings of Bluhm et al. (2013). Moreover, inequality also seems related to making crises less intense and to help countries fare better in periods of international turmoil. All in all, and considering our limited evidence for *unemployment*, we cannot say that *inclusion* has had a positive relation with resilience to economic shrinking.

The positive relation between different measures of transformation and growth or the negative one with some aspects of shrinking has been well documented in the literature (Bluhm, de Crombrugghe & Szirmai, 2013; Hausmann et al., 2014; Hausmann, Rodriguez & Wagner, 2006; Mcmillan, Rodrik & Sepulveda, 2017). However, we find rather weak and altogether contradictory evidence from our indicators pointing towards transformation having positive effect over crises duration or how countries fare in times of crisis.

Concerning State autonomy, we find a consistent opening effect of central bank independence over all durations. Moreover, in terms of faring in periods of international crisis, we consistently find the presumed negative effect of inflation and positive effect of central bank independence. All this is consistent with the literature about both growth topology (Bluhm, de Crombrugghe & Szirmai, 2013; Rodrik, 1999), and Latin America (Corbo & Schmidt-Hebbel, 2013; De Gregorio, 2013). Therefore, despite, tax revenue presenting a protective effect over durations and a negative relation with growth in times of crisis, we find that, all in all, the evidence points more toward *autonomy* being positively related to resilience to shrinking.

State accountability and social stability present the strongest evidence in line with the theoretical framework predictions. In terms of *accountability*, *Child mortality* has a protective effect over all durations, while *educational expenditure* and *access to electricity* present the opposite effect. Regarding social stability our main measures for conflict and institutional quality consistently show to have opening effects over durations, in agreement with Bluhm et al. (2013, 2016) who consistently found an

opening effect of good institutions (in both panel data and survival data analyses) over fall and stagnation spells. Moreover, the effects are consistent with the positive effects of stability and institutional quality over how countries fare in times of crisis.

Combining this last point and the results for *central bank independence* and *inflation*, our investigation seems to be rather supportive of the effects of the structural adjustment programs institutional reforms, at least in terms of building resilience to economic shrinking. Moreover, these results are in line with the findings of Rodrik (1999) in terms of both institutional quality and latent conflict being important on how different countries of the region during the lost decades of the 1980s and 1990s.

Finally, it should be pointed out that all our results are only valid (if) for the Latin American context. And it should be no coincidence that precisely those areas where the region has made the more progress (accountability and social stability) appear to be significantly related to certain aspects of resilience to shrinking. However, no country of Latin America is still "immune" to shrinking, and this could be read precisely in terms of the lack of *autonomy*, and more acutely of *inclusion*, and *transformation*.

5. Conclusions

Long term economic growth leading to development is as much about growing as avoiding spells of negative growth or shrinking. Historically much more attention has been given to understand what makes countries achieve high growth rates than to avoid shrinking. However, Broadberry and Wallis (2017) recently showed how the improvement of economic performance, in the long run, is accountable to the decline of the frequency and rate of economic shrinking, rather to an increase on the growth rate. Moreover, Andersson (2018), in a simple counterfactual experiment, showed that if not for the shrinking periods Latin America and Sub-Saharan Africa would not have diverged from East Asia in terms of GDP per capita.

Although it is pretty clear that growth collapses tend to be clustered in time (Perez Caldentey, 2010), and in particular around international crises, and moreover that the nature of the crises tend explains a significant part of their characteristics (Rodrik, 1999), we still know much less about what makes some countries fare better or consistently face shorter and less intense crises or recover faster. In this regard, Andersson (2018) proposed that social capability would be a road worth to explore in connection with economic shrinking. Backward but socially advanced countries would be able to catch up in large because they are able to avoid economic shrinking.

This was the departing point of our research, which we set to explore the relationship between social capability and different aspects of economic shrinking in the Latin American context making use of mostly public data and several different empirical methods. On the one hand, we explored the intensity and duration of crises (and its phases of fall and recovery) through panel data and survival analysis. On the other hand, we made use of the last three international crises that hit the region broadly to understand how different responses to them could be accounted for by differences in social capability.

Our main results offer mixed support to our theoretical framework (Andersson, 2018). The relation between social capability and the different aspects of economic shrinking proved to be a complex one, as we find that most aspects of social capability have mixed effects over durations, intensities, and the response to periods of international turmoil. First, we found that, despite the evidence being inconclusive, *inclusion* seems to have a rather negative relation with resilience to economic shrinking. Second, again, despite some mixed results, our evidence does not support transformation being positively related to resilience to economic shrinking. Third, although not conclusively, the evidence points toward *autonomy* being positively related to resilience to shrinking. Fourth, *accountability* showed a positive effect on both analyses; thus, it seems safe to say that this dimension is positively related with resilience to economic shrinking. And

finally, our results on measures of social stability, both in terms of latent stability and institutional capacity, largely point towards the same direction than state accountability: strong evidence of being positively related to resilience to economic shrinking.

These results are at odds with previous research – and our expectations – in terms of *inclusion* and *transformation* (Bluhm, de Crombrugghe & Szirmai, 2013, 2016; Rodrik, 1999), and largely in agreements concerning *autonomy*, *accountability* and *social stability* (Bluhm, de Crombrugghe & Szirmai, 2013; Jerzmanowski, 2011; Jones & Olken, 2008; Mobarak, 2005).

We believe to have contributed to broadening the knowledge base not only around social capability but also about the topology of growth and its episodic nature, as well as to the determinants of Latin American stagnation during the last 30 to 40 years. However, as usual, this research has left a lot unanswered and moreover opened new important questions that should be pursued in future research. For example, an exciting avenue for further exploration could be the inverted relation between crisis and social capability. Therefore, explore how social capability evolves in periods of economic downturn, and whether this evolution tends to help or make a recovery more difficult. Moreover, it would be interesting extending this analysis beyond Latin America while also exploring the relation or interaction between the different dimensions of social capability.

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7. Appendix

7.1. Appendix A

Table 7.1: Descriptive Statistics for Survival Data – Recoveries

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Avg. GDP pc growth (prev. 5 years)	100	0.0461	2.811	-8.782	5.790
GDP per capita	103	4,772	4,514	347.6	30,260
Log of GDP per capita	103	8.066	0.955	5.854	10.32
Gini Index (SWIID)	83	48.62	5.504	38.60	59.60
Education expenditure (% of GDP)	75	4.137	1.578	1.062	7.811
Net barter terms of trade	75	104.5	26.75	57.67	212.2
Agriculture share of GDP	99	10.56	7.765	0.434	33.83
Agriculture share of employment	58	19.26	11.46	0.709	51.63
Exports diversification Index	103	0.298	0.0795	0.185	0.537
Exports quality Index	103	0.855	0.101	0.529	1.143
Economic complexity Index	58	-0.153	0.459	-0.985	1.005
Inflation rate	103	91.66	351.8	0.245	2,892
Log of inflation	103	20.77	38.67	-0.471	214.4
Tax revenue (% of GDP)	69	15.70	4.754	4.839	31.16
Central bank independence Index	96	0.507	0.190	0	0.827
Access to electricity (% of pop.)	76	87.89	10.96	32.04	100
Country risk Index	64	3.979	1.129	1.835	6.760
Institutional quality Index	64	5.422	1.451	2.221	8.064
Social stability Index	64	7.426	1.280	3.819	9.349
NNRR rents (% of GDP)	87	3.890	5.922	0.0117	29.02
Child mortality	102	39.15	29.18	9.530	163.7
Unemployment rate	58	9.675	4.886	2.914	22.72
Ethnic fractionalization	103	0.371	0.195	0.0950	0.740
Linguistic fractionalization	103	0.458	0.206	0.135	0.794
Peak-bottom ratio	103	0.898	0.117	0.415	1.000
Duration of recovery	103	4.175	4.888	0	26
Duration closed	103	0.845	0.364	0	1

Table 7.2: Descriptive Statistics for International Crises Data – Absolute

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Avg. GDP per capita growth	99	0.554	2.706	-4.831	8.007
Avg. GDP pc growth (prev. 5 years)	94	2.773	2.705	-7.006	9.566
GDP per capita	99	4,702	4,939	243.2	30,188
Gini Index (SWIID)	80	48.65	5.681	27	59.90
Education expenditure (% of GDP)	76	3.862	1.855	0.905	9.814
Net barter terms of trade	71	122.7	48.05	62.12	305.4
Agriculture share of GDP	94	11.97	8.403	0.948	38.59
Agriculture share of employment	58	21.31	12.38	0.548	54.04
Exports diversification Index	98	0.294	0.0723	0.189	0.533
Institutional quality Index	75	5.182	1.552	2.059	8.350
Economic complexity Index	60	-0.184	0.459	-1.064	0.984
Inflation rate	99	71.22	317.3	0.825	2,807
Tax revenue (% of GDP)	55	15.19	4.875	7.057	31.16
Central bank independence Index	91	0.483	0.196	0	0.827
Access to electricity (% of pop.)	65	84.96	14.28	29.75	100
Country risk Index	75	4.169	1.171	1.582	6.775
Social stability Index	75	7.226	1.300	3.750	9.153
Exports quality Index	98	0.838	0.108	0.513	1.110
NNRR rents (% of GDP)	87	5.475	6.897	0.0113	28.74
Child mortality	96	49.41	40.21	7.440	211.9
Unemployment rate	58	8.801	4.751	2.794	20.33
Ethnic fractionalization	99	0.405	0.204	0.0950	0.740
Linguistic fractionalization	99	0.437	0.212	0.135	0.794
Log of inflation	99	18.68	31.10	0.800	190.3
Log of GDP per capita	99	8.036	0.931	5.498	10.32
Years of shrinking during the period	99	1.960	1.463	0	5
Debt crisis dummy	99	0.333	0.474	0	1
Asian Crisis dummy	99	0.333	0.474	0	1
Great Financial Crisis dummy	99	0.333	0.474	0	1

Table 7.3: Descriptive Statistics for International Crises Data – First-Difference

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Avg. GDP per capita Growth	99	1.066	3.960	-11.24	10.80
Years of shrinking during the period	97	-0.309	2.143	-5	4
Avg. GDP pc growth (prev. 5 years)	89	0.844	3.956	-10.39	10.10
GDP per capita	99	3,925	4,156	-1,194	23,850
Log of GDP per capita	99	0.877	0.517	-0.233	2.297
Gini Index (SWIID)	63	0.383	2.963	-4.400	11
Education expenditure (% of GDP)	61	0.250	1.532	-4.566	3.390
Net barter terms of trade	56	-25.22	69.70	-208.3	178.6
Agriculture share of GDP	89	-5.586	6.287	-32.08	16.11
Agriculture share of Employment	29	-3.395	5.065	-10.86	16.17
Exports diversification Index	97	0.0205	0.0448	-0.111	0.151
Exports quality Index	97	-0.00240	0.0923	-0.263	0.269
Economic complexity Index	60	-0.0366	0.330	-0.772	0.859
Inflation rate	99	-11.80	454.0	-2,799	2,793
Log of Inflation	99	-7.433	41.94	-182.4	168.1
Tax revenue (% of GDP)	37	0.574	3.691	-9.494	9.821
Central bank independence Index	83	0.179	0.200	-0.0625	0.633
Access to electricity (% of pop.)	32	6.054	4.378	-4.947	14.66
Country risk Index	75	-1.006	1.057	-3.591	1.365
Institutional quality Index	66	0.191	1.904	-4.820	3.581
Social stability Index	66	0.132	1.472	-3.828	2.691
NNRR rents (% of GDP)	84	-0.497	5.462	-18.93	13.04
Child mortality	93	-36.56	30.19	-128.9	0.180
Unemployment rate	29	-0.400	3.101	-10.87	5.448
Asian - GFC dummy	99	0.333	0.474	0	1
Debt - GFC dummy	99	0.333	0.474	0	1
Debt - Asian dummy	99	0.333	0.474	0	1

Table 7.4: Detail of Crisis Episodes

Country	First Year	Last Year	Bottom Year	Crisis Duration	Fall Duration	Recovery Duration	Closed	Peak-Btm Ratio
ARG	1981	1996	1990	16	10	6	1	79.3%
ARG	1999	2005	2002	7	4	3	1	78.1%
ARG	2009	2010	2009	2	1	1	1	93.1%
ARG	2012	2016	2016	5	5	0	0	94.7%
ATG	1992	1993	1992	2	1	1	1	99.5%
ATG	1995	1998	1995	4	1	3	1	93.2%
ATG	2001	2004	2002	4	2	2	1	93.0%
ATG	2008	2016	2011	9	4	5	0	76.2%
BHS	1970	1984	1975	15	6	9	1	67.1%
BHS	1990	1999	1993	10	4	6	1	84.5%
BHS	2003	2016	2016	14	14	0	0	82.4%
BLZ	1981	1988	1985	8	5	3	1	89.0%
BLZ	1994	2000	1998	7	5	2	1	94.2%
BLZ	2005	2006	2005	2	1	1	1	99.9%
BLZ	2008	2016	2009	9	2	7	0	98.8%
BOL	1978	2006	1986	29	9	20	1	73.5%
BRA	1981	1987	1983	7	3	4	1	86.6%
BRA	1990	1995	1992	6	3	3	1	92.9%
BRA	1998	2000	1999	3	2	1	1	97.8%
BRA	2003	2004	2003	2	1	1	1	99.8%
BRA	2009	2010	2009	2	1	1	1	98.9%
BRA	2014	2016	2016	3	3	0	0	91.2%
BRB	1981	1986	1982	6	2	4	1	92.6%
BRB	1990	1998	1992	9	3	6	1	85.5%
BRB	2001	2004	2001	4	1	3	1	97.3%
BRB	2009	2016	2014	8	6	2	0	95.1%
CHL	1973	1979	1975	7	3	4	1	80.5%
CHL	1982	1989	1983	8	2	6	1	82.0%
CHL	1999	2000	1999	2	1	1	1	98.3%
CHL	2009	2010	2009	2	1	1	1	97.5%
COL	1982	1985	1983	4	2	2	1	98.0%
COL	1998	2004	1999	7	2	5	1	93.5%
CRI	1980	1992	1983	13	4	9	1	84.4%
CRI	1996	1997	1996	2	1	1	1	98.8%
CRI	2009	2010	2009	2	1	1	1	97.7%
CUB	1986	2006	1993	21	8	13	1	62.2%
DMA	1979	1981	1979	3	1	2	1	80.9%
DMA	1994	1995	1994	2	1	1	1	99.8%
DMA	2001	2003	2002	3	2	1	1	96.9%
DMA	2009	2016	2013	8	5	3	0	95.8%
DOM	1984	1987	1985	4	2	2	1	94.9%
DOM	1990	1992	1991	3	2	1	1	91.8%
DOM	2003	2005	2003	3	1	2	1	97.2%
DOM	2009	2010	2009	2	1	1	1	99.6%

Table 7.4: Crisis Episodes (cont.)

Country	First Year	Last Year	Bottom Year	Crisis Duration	Fall Duration	Recovery Duration	Closed	Peak-Btm Ratio
ECU	1982	1994	1987	13	6	7	1	95.0%
ECU	1999	2004	2000	6	2	4	1	92.8%
ECU	2009	2010	2009	2	1	1	1	98.9%
ECU	2015	2016	2016	2	2	0	0	96.0%
GRD	1980	1982	1981	3	2	1	1	98.8%
GRD	1992	1996	1993	5	2	3	1	95.4%
GRD	2001	2002	2001	2	1	1	1	97.8%
GRD	2004	2005	2004	2	1	1	1	99.1%
GRD	2006	2007	2006	2	1	1	1	95.7%
GRD	2009	2015	2012	7	4	3	1	91.2%
GTM	1981	1999	1986	19	6	13	1	81.7%
GTM	2009	2011	2009	3	1	2	1	98.4%
GUY	1977	1996	1990	20	14	6	1	68.7%
GUY	2005	2006	2005	2	1	1	1	98.1%
HND	1974	1976	1975	3	2	1	1	95.0%
HND	1980	2002	1983	23	4	19	1	86.9%
HND	2009	2012	2009	4	1	3	1	95.6%
HTI	1981	2016	2004	36	24	12	0	55.2%
JAM	1973	1994	1985	22	13	9	0	64.6%
JAM	1996	2006	1998	11	3	8	1	93.7%
JAM	2008	2016	2010	9	3	6	0	92.1%
KNA	1991	1992	1991	2	1	1	1	97.7%
KNA	1998	1999	1998	2	1	1	1	98.5%
KNA	2003	2003	2005	3	1	2	1	95.2%
KNA	2007	2008	2007	2	1	1	1	98.8%
KNA	2009	2015	2012	7	4	3	1	92.1%
LCA	1980	1981	1980	2	1	1	1	96.5%
LCA	1991	1992	1991	2	1	1	1	99.1%
LCA	1997	1998	1997	2	1	1	1	98.1%
LCA	2000	2004	2002	5	3	2	1	94.3%
LCA	2009	2016	2013	8	5	3	1	96.9%
MEX	1982	1998	1988	17	7	10	1	87.6%
MEX	2001	2005	2002	5	2	3	1	97.0%
MEX	2009	2012	2009	4	1	3	1	93.2%
NIC	1978	2016	1993	39	16	23	0	41.5%
NIC	2009	2011	2009	3	1	2	1	95.5%
PAN	1983	1996	1989	14	7	7	1	78.9%
PAN	2009	2010	2009	2	1	1	1	99.5%
PER	1976	2006	1992	31	17	14	1	67.3%
PER	2009	2010	2009	2	1	1	1	99.8%
PRY	1982	1988	1984	7	3	4	1	90.1%
PRY	1992	1993	1992	2	1	1	1	99.2%
PRY	1996	1997	1996	2	1	1	1	99.3%
PRY	1999	2008	2002	10	4	6	1	88.3%

Table 7.4: Crisis Episodes (cont.)

Country	First Year	Last Year	Bottom Year	Crisis Duration	Fall Duration	Recovery Duration	Closed	Peak-Btm Ratio
SLV	1979	2012	1986	34	8	26	0	65.1%
SLV	2009	2012	2009	4	1	3	1	97.5%
SUR	1979	2007	1996	29	18	11	1	73.2%
SUR	2014	2016	2016	3	3	0	0	88.9%
TTO	1980	1981	1980	2	1	1	1	97.5%
TTO	1983	2001	1993	19	11	8	1	64.9%
TTO	2009	2016	2016	8	8	0	0	92.5%
URY	1982	1992	1984	11	3	8	1	78.5%
URY	1995	1996	1995	2	1	1	1	97.8%
URY	1999	2006	2002	8	4	4	1	84.4%
VCT	1973	1980	1975	8	3	5	1	72.4%
VCT	1987	1988	1987	2	1	1	1	99.8%
VCT	1994	1995	1994	2	1	1	1	98.7%
VCT	2009	2016	2010	8	2	6	1	94.5%
VEN	1978	2014	2003	37	26	11	0	62.4%
Total	**-**	**-**	**-**	**835**	**405**	**430**	**87**	**-**
Average	**-**	**-**	**-**	**8.1**	**3.9**	**4.2**	**0.8**	**89.8%**
Minimum	**-**	**-**	**-**	**2**	**1**	**0**	**-**	**41.5%**
Maximum	**-**	**-**	**-**	**39**	**26**	**26**	**-**	**99.9%**

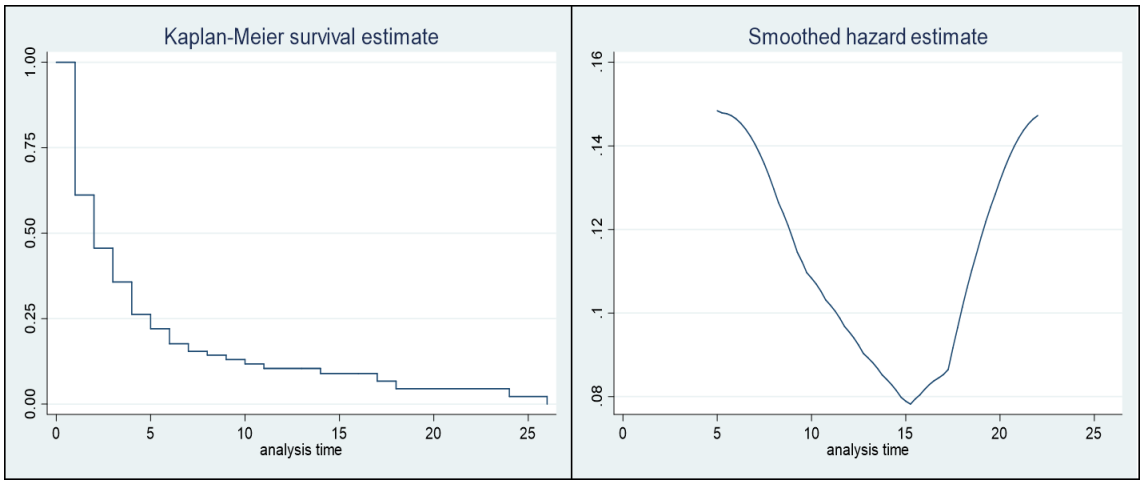

Figure 7.1: Unconditional Survival and Smoothed Hazard Functions – Falls

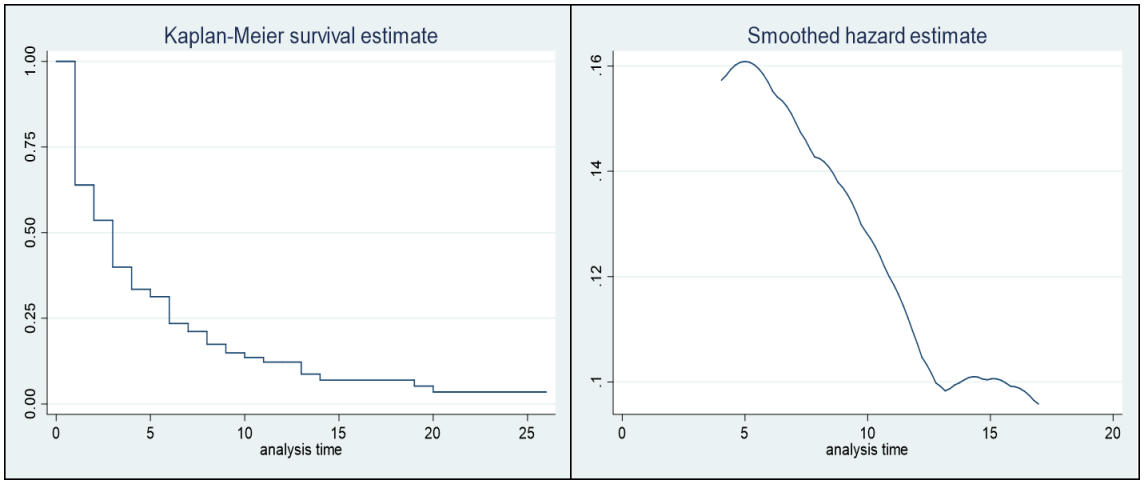

Figure 7.2: Unconditional Survival and Smoothed Hazard Functions – Recoveries

7.2. Appendix B

As a complement of the survival analysis, we conducted a panel data analysis with which we investigate two aspects. First, the relation between social capability and annual growth rates and the probability to shrink in any given year. For this, we estimate equation (1) with a regular OLS regression, and a dynamic random-effects probit model respectively. (The dummy variable for the latter takes the value of 1 if the growth rate of a given year is negative and 0 otherwise). Second, we explore the probability to enter, remain and exit periods of crisis and fall as defined above (dummy variables that take the value of 1 if the country is in a crisis or fall, and 0 otherwise).

Here we also rely on dynamic random-effects probit models in the same way Bluhm et al. (2016). One advantage of such models – with respect to standard linear probability models – is that they can account for the state dependence. However, since our specification relies on assuming that unobserved heterogeneity and the outcome are nor correlated, we cannot properly identify the presence and magnitude of the genuine state dependence (Grotti & Cutuli, 2019). Nevertheless, this is still progress when we intend to estimate models where we can reasonably presume state dependence.

Finally, dynamic random-effects probit models also tackle the initial condition problem, which refers to the presence of a correlation between the initial value of the outcome variable and unobserved factors. There are a few ways to deal with this, and our model relies on controlling for the initial state and the within-unit (country) average of our time variant independent variables (Grotti & Cutuli, 2019).

Our specific model specification (xtpdyn) has the following form:

$$y_{it} = \gamma Z_{it} + \rho y_{it-1} + c_i + u_{it} \quad (4)$$

Where y_{it} represents the probability of experiencing one particular status (shrink, crisis, or fall) in period "t" as a function of its state in the previous period y_{it-1} and a set of time-varying variables Z_{it} conditional to country-specific unobserved effects c_i (Grotti & Cutuli, 2019).

Descriptive statistics are presented in Table 7.5 and results in Table 7.6. For annual growth, we find that the only statistically significant (5%) variables are *agriculture share of GDP* and the *exports diversification index*. Both have the expected sign: the former shows a negative relation with growth, while the latter a positive one. Marginally significant (10%) are *inflation*, *child mortality*, and *country risk index*. The first two present the expected negative relationship with growth, while the latter a

positive one. Both the *Gini Index* and *central bank independence* have the expected relation, but both coefficients are not statistically significant.

Table 7.5: Descriptive Statistics (Panel Data)

Variables	(1) N	(2) mean	(3) sd	(4) min	(5) max
Annual GDP pc growth	1,219	1.527	4.231	-15.36	19.09
Avg. GDP pc growth (prev. 5 years)	1,209	1.537	2.808	-8.782	9.665
GDP per capita	1,219	4,813	4,889	243.2	31,018
Gini Index (SWIID)	971	48.66	5.636	24	60.40
Education expenditure (% of GDP)	940	4.103	1.809	0.900	12.97
Net barter terms of trade	951	110.4	34.59	50.98	306.6
Agriculture share of GDP	1,177	11.24	7.860	0.434	38.59
Exports diversification Index	1,220	0.296	0.0708	0.183	0.539
Exports quality Index	1,219	0.842	0.101	0.506	1.110
Inflation rate	1,221	73.50	302.0	-4.512	2,901
Log of inflation	1,221	18.47	32.28	-4.940	219.6
Tax Revenue (% of GDP)	736	15.34	5.019	4.839	35.25
Central bank independence Index	1,147	0.506	0.177	0	0.827
Access to electricity (% of pop.)	881	85.45	14.36	28.00	100
Country risk Index	925	4.146	1.184	1.558	6.981
Institutional quality Index	925	5.228	1.530	1.752	8.358
Social stability Index	925	7.268	1.329	3.750	9.382
Agriculture share of employment	754	20.97	12.24	0.343	55.30
NNRR rents (% of GDP)	1,077	4.569	6.099	0.00605	35.36
Child mortality	1,209	43.22	34.14	5.940	211.9
Unemployment rate	754	8.692	4.774	2.208	23.32
Ethnic fractionalization	1,221	0.405	0.203	0.0950	0.740
Linguistic fractionalization	1,221	0.437	0.211	0.135	0.794
Log of GDP per capita	1,219	8.059	0.938	5.498	10.34
Economic complexity Index	740	-0.201	0.447	-1.128	1.022
Dummy for year in crisis	1,221	0.631	0.483	0	1
Dummy for year in fall	1,221	0.329	0.470	0	1
Dummy for shrinking	1,221	0.300	0.458	0	1

Concerning the dynamic random-effects models, the correct way to understand these coefficients is as follows: a positive value indicates that higher values of that variable imply higher propensity for shrinking (higher probability of state=1) or a protective effect. For example, we find that richer countries are less prone to experience shrinking in all settings.

This analysis also provides coefficients for the initial state and the "within-unit average" of each explanatory variable. However, we will center on the standard coefficients. The first thing that stands out is that the direction of the coefficients is not always consistent

throughout all dependent variables. Agriculture share of GDP, Gini Index, and central bank independence seem to have a protective effect for annual shrinking and crises, and an opening effect for falls. However, the rest of our indicators are consistent through. Both exports diversification and quality, and country risk index present an opening effect, while child mortality and inflation present a protective effect.

Table 7.6: Panel Data Analysis Results

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)
	Annual GDP pc Growth	Dynamic Random-Effects Probit								
		Standard Coefficients			Initial State Coefficients			Within-Unit Avgs. Coefficients		
		Shrink	Crisis	Fall	Shrink	Crisis	Fall	Shrink	Crisis	Fall
Lagged state	-	0.277*	0.009	0.054	0.869*	**-1.424*** **	-0.265	-	-	-
	-	(0.145)	(0.099)	(0.138)	(0.444)	(0.272)	(0.198)	-	-	-
Log GDP pc year before	-0.065	-0.024	**-0.816*** **	-0.257	0.120	**-1.487*** **	-0.169	0.110	**2.016*** **	0.658
	(0.115)	(0.190)	(0.228)	(0.277)	(0.300)	(0.351)	(0.379)	(0.308)	(0.513)	(0.542)
Avg. GDP pc growth (prev. 5 years)	**0.789*** **	**-0.177*** **	-0.021	-0.001	**0.141*** **	-0.123*	0.016	**-0.162** **	0.003	0.057
	(0.063)	(0.031)	(0.034)	(0.024)	(0.047)	(0.064)	(0.073)	(0.067)	(0.066)	(0.102)
Gini Index (SWIID)	-0.001	0.003	0.102*	-0.011	**0.243** **	-0.021	-0.065	**-0.284** **	-0.068	0.037
	(0.018)	(0.044)	(0.061)	(0.058)	(0.102)	(0.069)	(0.073)	(0.116)	(0.097)	(0.096)
Agriculture share of GDP	**-0.021** **	0.044*	0.002	**-0.025** **	0.093	-0.036	-0.039	**-0.215** **	**0.100** **	0.064
	(0.009)	(0.023)	(0.015)	(0.011)	(0.059)	(0.039)	(0.037)	(0.099)	(0.044)	(0.056)
Exports diversification Index	**3.081** **	-2.852	-4.846	-7.870*	-2.576	-9.287*	-10.620*	**11.301*** **	12.746*	**17.161** **
	(1.312)	(2.700)	(3.638)	(4.445)	(3.975)	(4.897)	(5.852)	(3.792)	(7.232)	(7.798)
Exports quality Index	0.228	-1.843	**-3.115** **	-2.589	-2.429	**-8.966** **	2.289	2.811	**21.332*** **	2.639
	(1.398)	(2.068)	(1.522)	(1.587)	(3.417)	(4.320)	(4.077)	(5.595)	(6.122)	(5.351)
Log of inflation	-0.008*	-0.000	**0.004** **	0.002	-0.005	**-0.043*** **	**-0.021** **	0.005	**0.052*** **	**0.018*** **
	(0.004)	(0.003)	(0.002)	(0.001)	(0.009)	(0.011)	(0.009)	(0.005)	(0.013)	(0.006)
Central bank independence Index	0.204	0.485	0.090	-0.137	-1.194	**-2.153** **	-1.729*	0.094	1.501	**3.672*** **
	(0.473)	(0.614)	(0.489)	(0.477)	(0.761)	(1.016)	(0.913)	(1.119)	(1.498)	(1.286)
Child mortality	-0.007*	0.011	**0.008** **	**0.010*** **	-0.015	**-0.045*** **	-0.017	0.014	**0.062*** **	0.033
	(0.004)	(0.007)	(0.004)	(0.004)	(0.011)	(0.012)	(0.015)	(0.018)	(0.017)	(0.024)
Country risk Index	0.188*	-0.104	-0.101	-0.036	0.020	-0.103	0.065	0.300	0.152	-0.527
	(0.110)	(0.108)	(0.093)	(0.068)	(0.148)	(0.118)	(0.154)	(0.258)	(0.262)	(0.334)
Observations	652	641	641	641	641	641	641	641	641	641
Number of countries	25	25	25	25	25	25	25	25	25	25

Robust standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1