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2022

Document Version:
Other version

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Citation for published version (APA):

Andersson, M., Palacio, A., & von Borries, A. (2022). *Why has economic shrinking receded in Latin America? A social capability approach*. (Lund Papers in Economic History; No. 2022:236).

Total number of authors:
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Lund Papers in Economic History



No. 236, 2022

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Abstract

This paper investigates why economic shrinking episodes in Latin America and the Caribbean have declined since the 1970s. Following recent literature on long-term growth, we propose that the reduced frequency and rate of shrinking might reveal the dynamic transition from a natural state to an open-access society. Empirical support is derived from the notion of social capabilities: societies that invest in their social capabilities are more likely to reduce the shrinking frequency and flourish in the long term. Using survival models, we tested three capabilities (transformation, inclusion and autonomy) that, we argue, reflect an increase in resilience to economic shrinking. We found that transformation has not lowered the risk of shrinking in the region. However, both the inclusion and autonomy capabilities reduce the risk. We conclude that institutional transformations in Latin America and the Caribbean partly explain why economic shrinking has receded. Compared to previous decades, this is an essential step towards open-access societies. However, the persistent dependence on a narrow range of natural resources hinders progressive transformation and threatens the possibility of turning their economies to open societies.

Keywords: economic shrinking; income convergence; natural states; social capabilities

JEL code: O47; O57

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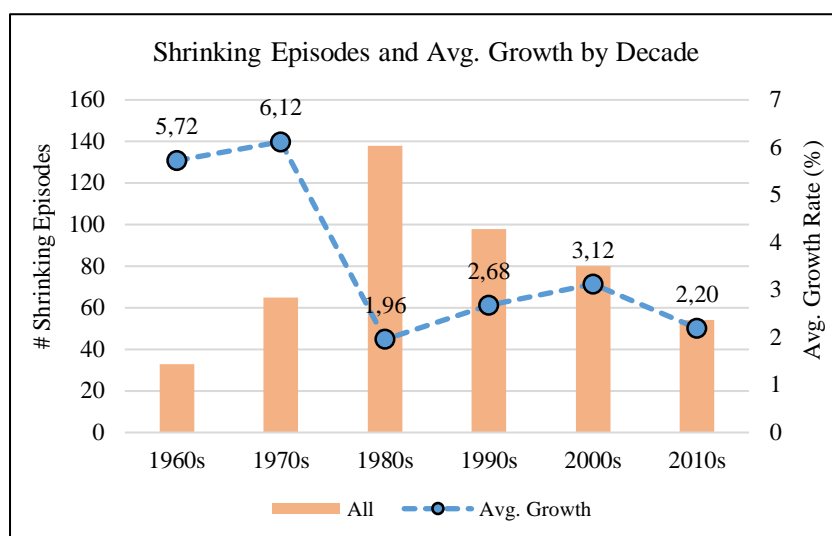
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1. Introduction

Throughout recorded human history, the process of long term growth has to different degrees been interrupted by occasional years of economic shrinking. While all countries hold the ability to grow, developing countries tend to experience much more economic shrinking compared to more prosperous countries. It turns out that long-term economic performance and the prospects of becoming an ‘open-access society’ actually depend on the decline in the frequency and rate of economic shrinking rather than increased economic growth (North et al., 2009). Consequently, economic shrinking, defined as a year when per capita growth is less than zero, i.e., when GDP per capita levels ‘shrink’, affects the prospect of income convergence between countries; therefore, resilience to shrinking cannot be omitted from empirical growth analysis. By resilience, we mean the ability of an economy to absorb or dodge a disturbance to avoid shrinking.

The paper explores patterns of economic shrinking and growth and hypothesised determinants of shrinking in 33 countries in Latin America and the Caribbean (LAC) during the period 1970–2016. Our point of departure is the simple observation that shrinking episodes increased from around 60 in the 1970s to 140 during ‘the lost decades’ of the 1980s. The number then reduced to 100 in the 1990s, 80 in the 2000s, before finally returning to 60 in the 2010s (Figure 1). Given these alterations in economic performance, we aim to understand why Latin America shifted towards low-frequency shrinking and whether this trend can be sustainable in the long run. Although per-capita GDP levels in LAC have demonstrated weak convergence with the levels of economic leaders (Roy et al., 2016), we argue that the decreased frequency and rate of economic shrinking in Latin America—not in the Caribbean—supports the contention that there has been a moderately positive transition towards open-access societies in recent decades.

Figure 1: Shrinking episodes and average growth rates in Latin America



Source: World Bank development indicators. Note: the graph covers data from 33 LAC countries

To empirically analyse whether this shrinking pattern marks a watershed in the modern economic history of Latin America, we apply a social capability framework. The social-capability approach advanced the debate surrounding income convergence in the 1980s, emphasising that only the ‘socially advanced’ within the technologically backward economies would exploit the benefits of backwardness a la Gerschenkron (Abramovitz, 1986, 1994, 1995). Abramovitz (1986: 405) defined social capabilities as the ability to “absorb more advanced technologies”, and they have taken the form of human capital, organisations and institutional policies. Potential indicators of these capabilities have included the right to vote, social capital, the enforcement of property rights, years of education, years of managerial and technical experience, and the share of credit provided to the private sector (Abramovitz, 1986; Rodrik, 2011; Temple & Johnson, 1998). However, the trouble with the concept has been that “no one knows just what it means or how to measure it” (Abramovitz 1986: 388).

Despite social capability being notoriously difficult to quantify, given the vague nature of the original definition, it is useful as a theoretical concept. While social capabilities in the relatively few studies that make use of the concept have been used to identify key components of the growth process, in this paper, we use it to capture resilience to economic shrinking and to understand the transition from what North et al. (2009) call a *limited access order* towards an *open-access order*. That is, moving from a situation in which organisation formation is restricted and the elite controls most of the assets to a situation in which the rule

of law impartially governs the society's operations. In such an open-access society, assets and rents are to benefit the many rather than the few.

To unpack and specify Abramovitz's social capabilities (1986, 1995), it is necessary to focus on critical aspects that emerge in the process. To this end, we built on previous work of Andersson's modified approach which facilitates empirical scrutiny (Andersson & Andersson, 2019; Andersson, 2018; Andersson et al., 2020). Following Abramovitz, this approach regards social capabilities as a set of national characteristics that constitute more fundamental determinants of the long-term growth trajectory than triggers of the short-term capacity to create growth. By implication, social capabilities are factors related to resilience to economic shrinking. Drawing on this approach, we focus on three capabilities that are particularly relevant in the LAC context: the ability for transformation, autonomy, and inclusion. These capabilities, grounded in social science theory, are empirically operational and should be considered interactive processes rather than mere outcomes.

We argue that a progressive change in each capability strengthens resilience to economic shrinking in different ways: (i) the transformation capability suggests a market-based transformation of the economy away from being relatively undiversified and resource-dependent; (ii) the autonomy capability suggests a state that designs and enforces non-partisan laws to avoid interference from vested interests; and (iii) the inclusion capability marks a society with broad-based access to, and participation in, productive activities and socio-political initiatives for compensating those with limited access to opportunities. Essentially, we hypothesise that societies that invest in their social capabilities experience less risk of shrinking and, therefore, a greater chance of achieving economic convergence.

We have investigated this hypothesis using survival models that incorporate multiple shrinking episodes across countries. The survival models were tested in various subsamples (South America or Mexico, Central America, and the Caribbean) within the region. For transformation capability, our models showed, counterintuitively, that increases in the export diversification index would lead to higher risk of shrinking in the next period. This result can be partly explained by technological upgrades mostly occurring within the natural resource sector rather than across sectors (Crespi et al., 2018). Furthermore, becoming the largest global food-and-commodities exporter in the 2000s connected a select few to global value chains, but failed to generate sufficient forward and backward linkages with, for instance, the manufacturing sector. Consequently, the boom did not generate increased society-wide complexity and structural change.

We also find that the inclusion capability, measured by the Gini coefficient, is likely to lower the risk of shrinking. LAC is riddled with a history of inequality and persistent unemployment, except for the 2000s when the income distribution improved for the first time in almost 150 years (Sánchez-Ancochea, 2019). The improvement came mostly from increases in productive employment and extended coverage of social policies. However, sustaining high employment levels with a productive structure dependent on a few natural resources and political instability is likely to be difficult. Even if the windfalls from the boom enabled expansion of social protection policies in the labour market, one-third of the population remained outside of the formal economy (ECLAC, 2012).

Meanwhile, our model's measurement of autonomy indicated a decline in the risk of shrinking. This decline is associated with the end of autocratic governments, prevalent during the 1970s and 1980s, when the primary beneficiaries from the state-led growth model were a select group of privileged elites (Thorp & Lowden, 1996). Subsequent transitions to democracy introduced new institutions and judicial practices to promote open markets and private rights, reduce public corruption and increase human rights (Domingo, 2012). The democratisation of these societies improved the quality of institutions and policymaking, with a useful example being the introduction of central banking independence to control inflation regimes in the early 1990s (Cukierman, 2008). While the benefits of low inflation are well documented, it is imperative for institutional independence to be able to deliver reliable information and reduce uncertainty.

This paper's main conclusion is that reduced shrinking is associated with the institutional transformation connected to the region-wide shift to democracy. However, these transformations were not able to foster a more complex economy. In the 2000s, natural resource-oriented growth – attached to favourable terms of trade – facilitated the decline in the frequency and rate of shrinking. These terms of trade have deteriorated since 2014 and might offset the recent improvement of the income distribution. Hence it is a major challenge to maintain gainful employment in export sectors and expand social protection in a setting of declining terms of trade and taxation revenue. Accordingly, it seems necessary for national innovation systems to support the Kuznetsian process of structural change of the economy. In contrast to previous decades, LAC nations now have the advantage of consolidating the autonomy capability to provide a better foundation for investment in the capabilities of transformation and inclusion.

In the catching up perspective applied in this paper, self-sustained growth is a function of the ability to promote structural transformation (technological upgrading and diversification), the inclusion of people to generate and share the economic surplus, and the modernization and nation-building properties of the state to set up autonomous and accountable arrangements. Accordingly, a late-comer country that manages to develop these social capabilities has a higher probability of increasing its resilience to economic shrinking, enabling catching up towards richer countries. In turn, such growth generates further advancements of social capability and makes the entire process mutually reinforcing and virtuous. Inherent in the capability approach is the two-way direction of causality between capabilities and resilience to shrinking. By implication, as the development of social capability fosters higher resilience to economic shrinking, we would also expect growth to be better sustained and self-generating.

The paper has six sections. The next section illustrates the declining rate and frequency of shrinking in developing countries since the 1970s. The third section presents the theoretical ideas underpinning the capability approach and its relationship to economic shrinking. Section four details the data and method used, before section five presents the results, and section six delivers our conclusions.

2. Economic shrinking in developing countries, 1970-2016

Economic shrinking is most strongly associated with the least developed or poorest economies (Easterly et al., 1993). These countries are poor because they more frequently experience shrinking episodes than rich countries, and as countries develop, both the frequency and rate of shrinking tend to decline (Andersson, 2018; Broadberry & Wallis, 2017; North et al., 2009). To document this pattern, table 1 shows the frequency and rate of shrinking and growth across various regions of the developing world as decadal averages. The rate of shrinking is the average of the shrinking years, and the rate of growth indicates an average of the growing years.

Table 1. Shrinking and growing in the developing world, by decades.

	1971-1980	1981-1990	1991-2000	2001-2010	2011-2018
Asia first tier					
Frequency of shrinking	6%	6%	12%	20%	3%
Rate of shrinking	-2,5%	-1,3%	-4,8%	-2,0%	-0,1%
Rate of growing	7,0%	6,5%	4,8%	4,3%	2,2%
Asia second tier					
Frequency of shrinking	24%	14%	10%	9%	2%
Rate of shrinking	-2,9%	-3,2%	-4,8%	-2,4%	-0,4%
Rate of growing	4,8%	4,6%	4,3%	5,3%	4,2%
Eastern Europe					
Frequency of shrinking	4%	36%	24%	12%	11%
Rate of shrinking	-3,5%	-4,5%	-5,0%	-6,7%	-1,9%
Rate of growing	5,3%	3,5%	6,1%	6,4%	3,5%
Latin America					
Frequency of shrinking	21%	48%	25%	18%	11%
Rate of shrinking	-3,3%	-4,5%	-2,6%	-3,0%	-3,3%
Rate of growing	4,0%	2,5%	3,1%	3,8%	2,8%
Latin America without Venezuela					
Frequency of shrinking	20%	47%	23%	17%	8%
Rate of shrinking	-3,4%	-4,4%	-2,5%	-2,7%	-2,1%
Rate of growing	4,1%	2,5%	3,1%	3,5%	2,8%
The Caribbean					
Frequency of shrinking	25%	31%	28%	36%	32%
Rate of shrinking	-5,7%	-3,1%	-2,5%	-2,7%	-1,6%
Rate of growing	5,8%	4,7%	3,4%	3,9%	2,2%
Middle East & North Africa					
Frequency of shrinking	35%	47%	28%	29%	39%
Rate of shrinking	-7,2%	-7,4%	-4,9%	-2,8%	-3,5%
Rate of growing	7,7%	6,2%	6,8%	3,6%	3,1%
Sub-Saharan Africa					
Frequency of shrinking	45%	52%	43%	24%	18%
Rate of shrinking	-4,5%	-4,0%	-4,3%	-3,4%	-4,2%
Rate of growing	5,0%	3,4%	4,6%	5,0%	3,2%

Source: Penn data version 9.1. See appendix for the list of countries.

The table reveals three patterns. First, on average, over the entire period from 1970 until 2000, Sub-Saharan Africa features the highest shrinking frequency in the developing world, followed by the Middle East and North Africa. The Caribbean and Latin America occupy the third and fourth positions. Most notable is that even if the average rate of growth is somewhat higher in Asia than in the rest of the regions, the frequency of shrinking in both first and second-tier Asia is significantly lower than in the rest of the regions. Second, frequencies of

shrinking have declined in most regions following period 1981–1990, with Latin America being especially successful. From the 2000s onwards, the decline in the frequency of shrinking occurred everywhere, but not in the Caribbean and the Middle East and North Africa. Third, the rate of growth has also been in decline everywhere, but accelerated during the commodity boom of the 2001–2010 decade.

While shrinking episodes can derive from shocks – such as export collapses, sudden capital freezes, high inflation, natural disasters, regime changes, and violent conflicts – a theoretical explanation using neoclassical models indicates that adverse changes in fundamentals (institutions and human capital) over long periods might offset the effects of technical progress (Hausmann et al., 2006; Rodrik, 2000). However, models that decompose growth into factor accumulation and technical progress, or TFP, cannot ‘explain’ shrinking since capital and labour tend not to disappear (i.e., both physical and human capital are long-lasting) (Pritchett, 2000). Furthermore, attributing shrinking to negative TFP provides little information because it cannot disentangle its principal components. In other words, these theories have limited power to explain why some countries are more prone to shrinking than others. For instance, why East Asia has been more resilient to shrinking than Latin America – despite the latter having a higher income per capita in the 1960s – remains unanswered. We argue that the best way to address questions like this is to apply a social capability approach.

3. Economic shrinking and the capability approach

North et al. (2009) argue that one of the main characteristics of modern societies, in which material prosperity and political liberties are combined, is that their economies experience fewer economic shrinking episodes. That pattern is associated with the transition from limited-access natural states to open-access societies. Their framework suggests that the transition from a natural state to an open-access society relies on the consolidation of three specific doorstep conditions, or significant institutional changes (North et al., 2009): (i) the establishment of the rule of law, meaning that ‘the law applies equally to all elites and [is] enforced without bias’ (pp.156–157); (ii) that perpetually lived organisations become dominant, ‘defined by the identity of the organisation rather than the identity of its members’ (p. 152); and (iii) that the state has a monopoly on violence and that the military does not significantly interfere in economic or political matters. Notably, a natural state limits ordinary citizens’ rights and possibilities to form organisations of economic and political significance (North et al., 2009). This limited access to organisations typically concentrates assets and

rents among the select few that can form organisations. In a natural state aspiring to elevate to an open-access society, it is critical to consolidate the doorstep conditions mentioned earlier. Our approach suggests that these conditions can be empirically captured by assessing the evolution of social capabilities that we argue will increase a society's resilience to economic shrinking.

The natural state is the most typical form of rule in human history, and it still represents approximately 85–90% of the countries in the world. However, these limited-access natural states may conform to different sub-categories (North et al. 2009, p. 21): (i) *fragile* natural states that are unable to support any organisation other than the state; (ii) *basic* natural states that can support organisations, but only within the framework of the state; and (iii) *mature* natural states that can support a broad range of more complex organisations outside the direct control of the state. According to North et al. (2009), mature natural states might become open-access societies when the doorstep conditions have been fulfilled. Although several basic natural states exist on the continent, the vast majority of LAC countries can be categorised as mature natural states; however, no country has become an open-access society. To enable such a transition, countries must abolish institutional arrangements that enforce the rule of law unequally and with partisan bias, limit the right to create autonomous organisations, or use violence to avoid negotiation or participation.

To better understand these grand processes, we apply a social capability approach. Our selection of social capabilities is derived directly from Abramovitz (1995), who in turn based his discussion on the work of Simon Kuznets. Abramovitz divided the social capabilities into two sets of elements relating to (1) “people’s basic social attitudes and political institutions” and (2) “the ability to exploit modern technology”. The first group of elements (1), covers, according to Abramovitz, the provision of effective and just incentives. Given the weight Kuznets (1966) assign to the key role of *egalitarianism*, Abramovitz (1995) suggests such incentives to be “the social outlook that opens the way to talent and sanctions rewards for its accomplishments” (p. 32). In our conceptualisation, we regard this simply as ‘inclusion’, characterising the extent of individual access to productive resources, social overhead and whether the market is open to entry. If inclusion is suppressed, social tension and instability are likely to be frequent characteristics of the social outlook. Concerning effective political institutions, we argue this is captured by what we call the autonomy capability. While we recognize the importance of formal institutions, we argue that they are mainly influential to the extent that there is the capacity for enforcement (Greif, 2008).

The second group of elements (2), i.e., the ability to exploit modern technology, is at the social level effectively synonymous with ‘transformation’, which is an indicator of the ability of an economy to allocate productive resources to economic activities with higher value-added (see Hausmann et al. 2013). In short, from Abramovitz’ two groups of elements, we derive three distinct but inter-related and, in principle, measurable capabilities: *transformation*, *inclusion*, and *autonomy*.

Hence, the capabilities we select come from Abramovitz’ hypothesis and the doorstep conditions suggested by North, Wallis and Weingast. However, both frameworks lack precision for empirical scrutiny, which is a logical effect of their frameworks’ scope and objectives, respectively: NWW are discussing secular changes taking place over centuries, and Abramovitz was looking for the fundamental sources of growth beyond conventional neo-classical growth accounting. Our capability approach suggests empirically tangible indicators that capture and shed light on more short-term changes. These are detailed in the following paragraphs.

Transformation describes the ability to invest in more productive technologies that may reduce the dependency on a narrow range of resources with a volatile aggregate output (Acemoglu & Zilibotti, 1997). If the establishment of new organisations is allowed, incentives to invest in new technologies increase (Cox et al., 2019), and simultaneously, opportunities to adopt new technologies can pave the way for new organisations. These changes likely make economies less prone to shrinking. This expectation appeared reasonable as LAC embraced a process of economic liberalisation following the late-1970s debt crisis. The region moved from state-led and inward-looking industrialisation strategies towards export-oriented strategies based on natural resources, and ideas from the Washington consensus promoting a smaller state, macroeconomic stability, trade, financial liberalisation, and fiscal reform (Saad-Filho, 2010). During the 1990s, state-owned enterprises in LAC accounted for over 55% of the privatisation revenues globally (Chong & Lopez de Silanes, 2005). The renewed reliance on the market led to more private competition to exploit the comparative advantage of natural-resource sectors, while macroeconomic policy could avoid risks and threats from the external environment (Spillan et al., 2014). The ideological shift, at least theoretically, opened up the possibility of new organisations and technological change.

Autonomy describes the ability to choose rules and regulations that prevent interference from vested interests (Cafaggi & Pistor, 2015). Historically, elites often choose the institutional setting that protects their relative standing at the expense of other groups and,

therefore, society at large (Acemoglu & Robinson, 2012). If the costs incurred by the relatively disadvantaged groups are greater than the benefits to the dominant elites, economic shrinking is more likely (Cuberes & Jerzmanowski, 2009). Accordingly, shrinking can, to some extent, be counter-acted by consolidating democratic rule through the three doorstep conditions mentioned earlier (the rule of law, monopolising violence, and enabling organisation formation). These conditions are central to creating independent institutions with insulated bureaucracies – such as central banks and development agencies – and state-owned enterprises that reduce the risk of shrinking by providing vital public goods or enforcing laws impartially (Courpasson & Clegg, 2006).

This hypothesis also fits the recent experience of LAC. In the 1970s, only five countries in the region featured civil governments¹, with the military in the rest of Latin America curtailing political mobilisation and leading national development efforts according to the Import Substitution Strategy of Industrialization (O'Donnell, 1978). In a climate of relatively rapid growth, the region's debts grew more than tenfold between 1970 and 1982 (Sachs & Williamson, 1985). Taxation was low, and asking central banks² to fund government expenditures was common. One notorious result of these actions, inflationary pressure, was inseparable from the actions of these autocratic governments. However, following the debt crisis, autocratic rule in the region declined, and out of the 33 countries, only two remained in the hands of dictators (Cuba and Haiti). The transition to democracy provided room for the gradual consolidation of the rule of law, the creation of political parties, and the monopoly of violence under civil governments. One of the main achievements in decision-making policy was reforming the role of central banking in macroeconomic stability and reduced inflation rates (Cukierman, 2008; Jácome & Vázquez, 2008).

Finally, *inclusion* describes the ability to distribute access to economic opportunities broadly and institutionalise a progressive response to individuals and groups of the population that have been curtailed or excluded from participating in the distribution of assets and power (Almond & Powell, 1966; Rodrik, 2000). Recent literature has found support for the notion that inequality seems to be related to growth-break episodes (Berg & Ostry, 2017). A growth break can turn into an episode of economic shrinking. Consequently, a welfare system or

¹ Colombia, Costa Rica, Dominican Republic, Mexico and Venezuela

² The mode of legal independence in central banking became the norm in most countries: Chile (1989); El Salvador (1991); Argentina, Colombia, Ecuador, Nicaragua and Venezuela (1992); Mexico and Peru (1993); Honduras (1994); Bolivia, Costa Rica, Paraguay and Uruguay (1995); and Guatemala (2001).

anticyclical expenditure policies that respond to the unpredictable consequences of economic shrinking could make society less prone to *inequality-induced social instability*.

This hypothesis is also reasonable for LAC, where high inequality levels have existed since colonial times and especially during regimes based on the Import Substitution Strategy of Industrialization and the Washington consensus (Williamson, 2015). However, following decades of persistent inequality, the political elites seem to have understood that the legitimacy of the market-oriented model relies on protecting the labour force from international macro-economic shocks (Fiszbein et al., 2014; Saad-Filho, 2010). Additionally, following Chile's example, most LAC countries began upgrading their social protection systems in the 1990s (ECLAC, 2012).

However, inclusion remains limited given that – except for Argentina and Brazil – tax collection in the region does not constitute more than 30% of GDP (WorldBank, 2020). Informal economic practices still involve approximately one-third of the population (ECLAC, 2012). Nonetheless, social protection is now a significant component of the region's development discourse. Fiszbein et al. (2014) estimate that LAC countries transfer benefits constituting close to 30% of the average poor's person income/consumption. Economic inclusion may provide citizens with more resources to engage in politics and broaden political inclusion. Likewise, political inclusion might make demands for economic inclusion more likely to impact policy-making, and reinforce citizens' commitment to democracy. Such a virtuous cycle will likely reduce social tensions, hence strengthen resilience to shrinking.

As a sum up, our theoretical approach stems from combining the social capability hypothesis for catch-up growth by Abramovitz and the framework in *Violence and Social Orders* by North, Wallis and Weingast. Our point of departure is the empirical observation that the achievement of generating the long-term growth required for becoming an open access society hinges foremost on the reduction of the frequency of economic shrinking. While all economies can generate growth, only a few have displayed the ability to move from a shrinking-prone to a shrinking-resilient economy. Accordingly, the key that would enable economically backward economies to catch up with economically more progressed economies lies in developing resilience to economic shrinking. This resilience reflects certain qualities in the structures of the economy and capabilities in the fabric of society. Abramovitz formulated his social capability hypothesis around the deep-seated conditions for growth. The capabilities he proposed were meant to capture the facilitators of long-term catching up, i.e., given what we know today, a growth process marked by a lower frequency of economic shrinking.

Hence, we hypothesise that social capabilities are negatively associated with economic shrinking over the long term even if the advancement of social capabilities does not lead to complete avoidance of shrinking – also, the most endowed country in the world occasionally shrinks. The social capabilities, however, increase the resilience to shrinking. The analysis detailed in the following sections tests the hypotheses concerning these three social capabilities.

4. Social capabilities and the pattern of shrinking: data and methods

Growth slumps and economic crises are a standard but elusive area of interest of macroeconomics (Hausmann et al., 2006), with the conventional investigative approach being to use average between-country output growth paths. However, this approach disregards essential information and does not answer questions regarding certain growth episodes becoming more frequent or relatively delayed (Berg et al., 2012). To address these questions, some studies have used survival analysis to examine the relationship between the duration of growth periods and the various predictors, or ‘hazards’, of growth. Instead of sustained growth, our approach concerned the opposite, considering each episode of economic shrinking, which would be otherwise subsumed in the average and, thus, understudied.

Using a sample of 33 LAC countries, we identified 430 shrinking episodes between 1970 and 2016 (see Appendix Tables A and B). The phenomena studied were ‘multiple-failure time data’, a concept defined by the same subject experiencing two or more events (Cleves et al., 2008). For example, Colombia experienced five shrinking episodes, while Argentina experienced 22. The episodes happened in different years and sometimes sequentially. In contrast, a simple average, or the relative frequency during a specific interval, would miss potential information derived from the failure time between shrinking episodes.

To analyse this data, we used particular types of survival models known as ‘variance adjusted models’, which utilise all shrinking episodes while also considering the interdependence of the failure times (Cleves, 2019). Specifically, we employed a version known as the ‘conditional risk set model’, which assumes ordered failure events where ‘the subject is not at risk of a second event until the first has occurred and so on’ and time until each event is measured from the previous event rather than from the time of entry. Finally, we

used a semiparametric Cox³ proportional hazard model to relate the shrinking episodes at each failure time to a set of predictors.

The choice of a semiparametric model was based on making fewer assumptions of the functional form and the nature of the approach. In other words, the predictors, or indicators of capabilities, were based not on a particular theory but a variety of ideas drawn from the existing literature. The predictors, or indicators of capabilities, cover an average of 10 years before a shrinking episode. The relationship between the capabilities and the multiple-failure-time data is expressed in equation 1:

$$h_j(t) = g(t, \beta_0 + X_j\beta_x) \quad (1)$$

The outcome variable is $h_j(t)$, or the hazard rate capturing the multiple failures and the time between the events. The Cox model has no intercept, and therefore the value of β_0 , or the baseline hazard, is undefined. β_x is a vector of unknown regression coefficients for three predictors of shrinking: (i) the export diversification index from the International Monetary Fund, capturing the transformation capability (IMF, 2019); (ii) Garriga's (2016) central bank independence index, capturing the autonomy capability (Garriga, 2016); and (iii) Solt's (2020) Gini index, capturing the inclusion capability (Solt, 2020). We selected these three variables based on the sequential testing of potential predictors of the capabilities while controlling for previous years of growth (see Table C for the variable-by-variable analysis). All variables were regressed independently, but – following Berg et al. (2012) and Bluhm et al. (2013) – including only controls related to per-capita GDP⁴ level and past growth. These controls were chosen based on the LAC business cycle. The latter is characterised by recession periods that are long and weak relative to other developing regions (Pérez Caldentey et al., 2013). The average expansion in LAC is close to three years, and the commodity boom in the 2000s lasted seven years. In East Asia, in comparison, the average expansion lasts eight years. Net barter terms of trade are also included because their change is usually associated

³ The Cox proportional model makes fewer assumptions than typical parametric methods and is, therefore, the most popular model for measuring the relationship between predictors and the time to event – the shrinking episode – through the hazard function.

⁴ There were three main reasons for this selection. First, this is a reliable and widely used dataset that offers information dating back to at least 1978 for all LAC countries. Second, local currency appeared most adequate for characterising shrinking episodes. Third, given the study is not only interested in productivity but also in welfare, a per-capita measure over a per-worker one was preferred. However, when controlling for per-capita GDP level, a measure using current US dollars from the World Bank database was considered.

with external shocks leading to economic shrinking (Berg et al., 2012; Rodrik, 1999). In some analyses, we included natural-resource assets, the measures of ethnic and linguistic fractionalisation. These measures are relevant to LAC macro-economic development and have been present in previous research (Alesina et al., 2003). In sum, the controls are expected to capture changes in the world market that might have driven economic performance but would have remained exogenous to the process of social-capability formation.

Finally, we attempted to collect information characterising all the countries during the study period, but some information gaps remain. For instance, poorer countries in the region are highly under-represented in the data. Pre-1990s information is particularly scarce and, when available, it is more abundant for wealthier countries, particularly those of the southern cone. We group countries in various subregions: all 33 countries, South America, South America and Mexico, South America and Central America, and South America and the Caribbean. Our variables cover an average of 10 years prior to observation, but we also run the exercise with 5 years. The results did not change regardless of the number of countries or the average of 5 or 10 year.

Any exercise of this kind is also subject to other types of specification bias (Hausmann et al., 2006): (i) simultaneity bias potentially being present in this case due to the interconnection between the different dimensions of social capability, and (ii) omitted-variable bias almost certainly present due to the lack of a theory of economic shrinking. Endogeneity is also an issue in this kind of research because the explanatory variables are also a function of the growth and development trajectory. However, while in the short-to-medium term, the stock of social capabilities renders them less likely to be affected by the business cycle, in the longer term, a country's social capabilities level is most likely to be a function of its historical growth trajectory.

5. Results

This section examines the empirical relationship between social capabilities and the incidence of shrinking episodes. The sample comprises 33 LAC countries, with Table 2 presenting the results of a survival model using odds ratios. An odds ratio of 1 indicates that the probability of the event occurring was not affected by the related covariate. An odds ratio greater than one indicates a higher instantaneous probability of occurrence; we label this a 'triggering' effect of that covariate over the duration. Conversely, an odds ratio below one indicates an 'avoidance' effect or a lower instantaneous probability of occurrence. It is worth noting that

the coefficient estimates do not change with the number of countries. Similar work has been done for sustained growth periods, but not for shrinking (A. Berg et al., 2012; Bluhm et al., 2013).

We found that the risk of economic shrinking increased with the export diversification index for all subsamples. In all models, export diversification increases the risk of shrinking. However, this does not suggest that the most diversified and complex economy become more prone to economic shrinking. At a global scale, the association between diversification and resilience to shrinking is conclusive, with the most complex economies in the world (as measured by the Economic Complexity Index) shrinking the least. Instead, our result suggests that LAC has not registered significant improvements in its production matrix since the 1980s (Hartmann et al., 2017; Ocampo, 2007). Except for Mexico and Brazil, there was modest improvement in the technological matrix and the diversification of the region's exports (Hartmann et al., 2017; Weiss & Jalilian, 2004). Indeed, technological improvements were mostly concentrated within the natural-resource sector (Crespi et al., 2018; Katz, 2001), especially those proclaiming the *reprimarisation* of the economy during the recent commodity boom appear to have been correct (ECLAC, 2012). The commodity boom, which lasted almost seven years, was seemingly unprecedented good fortune that mitigated the risk of shrinking over the previous decade. Both controls measuring growth from previous years and terms of trade confirmed that the risk of shrinking had declined. Accordingly, we can conclude that, despite reduced shrinking episodes in recent decades, the region's transformative capability did not increase.

Regarding the inclusion capability, the risk of shrinking decreases when the distribution of income is more evenly spread. Our framework anticipated weaker resilience to shrinking when a substantial part of the population was not engaged in productive activities or not benefitting from key public goods such as physical security, health care or social protection schemes that could diffuse social discontent and inequalities. Our estimations support this contention in all our samples. There have been important advances since the 1990s. First, the expansion of the social protection system from 2.6 per cent of GDP in the early 1990s to 3.2 per cent of GDP in the late 2000s (Sánchez-Ancochea, 2019) and more recently, the lowest unemployment records during the boom of 2000s. The boom allowed also governments to avoid excessive pressure on the fiscal budget and the balance of payments (Bértola & Ocampo, 2012). Not surprisingly, the income gap with the developed world also narrowed during this period (Moreno-Brid & Garry, 2016). But, as a caveat, this might be a

one time event in the history of the region. In short, the capability of inclusion measured by the Gini index suggests that more equal distribution of income reduces the risk of shrinking.

Table 2. *Survival models of economic shrinking in LAC, 1970-2016*

VARIABLES	Full Model	South America	South A. + Mexico	South A. + Central A	South A. + Caribbean
	Odds ratio				
Transformation					
Exports Diversification Index	2.823 (2.478)	9.067 (14.060)	10.053 (16.437)	7.697 (12.139)	4.415** (3.325)
Autonomy					
Central Bank Independence	0.444* (0.187)	0.462 (0.322)	0.594 (0.403)	0.304* (0.208)	0.671 (0.320)
Inclusion					
Gini Index	0.986 (0.011)	0.977** (0.010)	0.980** (0.009)	0.988 (0.015)	0.983 (0.012)
Controls					
Log of GDP pc Prev. Year	1.040 (0.081)	0.686 (0.168)	0.715 (0.155)	0.843 (0.131)	1.034 (0.085)
GDP pc Growth Prev. 5 Years	0.699*** (0.022)	0.728*** (0.036)	0.716*** (0.036)	0.697*** (0.026)	0.708*** (0.028)
Net barter terms of trade prev. 5 years	0.998 (0.002)	0.998 (0.002)	0.997*** (0.001)	0.999 (0.001)	0.996 (0.002)
Observations	252	112	125	175	183
Shrinks	236	105	117	161	174
log L	-367.8	-101.1	-122.6	-205.8	-225.4
LR test Chi2	221.6	96.81	146.3	339	93.94
Pseudo R-squared	0.137	0.169	0.159	0.172	0.138
Robust seeform in parentheses					
*** p<0.01, ** p<0.05, * p<0.1					

Finally, as expected, the risk of shrinking declined with the strengthening of non-partisan institutions, indicating improved autonomy. The avoidance effect run in the right direction in every subsamples, and was statistically significant in the full sample. This means, institutional changes advancing democratisation and high-quality economic policymaking are ongoing and apparently persistent. Increased legal independence and law enforcement has been a gradual process governed by rules and procedures. Such consolidation of the rule of law provides less uncertainty and more information to actors at all levels of society. This might, to some extent, explain why there has been no reversion to autocratic rule in the region.

6. Conclusions

Historically, research has focused on understanding what actions promote high economic growth rates rather than what actions avoid economic shrinking. However, recent studies have demonstrated that countries that experience less shrinking are more likely to catch up with the developed world. Accordingly, we used a social-capability approach to explore what societies can do to reduce economic shrinking, with LAC chosen to test this empirical relationship for several reasons. First, although the LAC experience indicates that economic shrinking episodes have been clustered, especially around international crises, still relatively little is understood about why the frequency of economic shrinking declined in the region. Second, the relative institutional and cultural homogeneity of the region provides sufficient variability in terms of development level and social capability stocks while simultaneously counteracting potential omitted-variable biases. Third, LAC offers better data quality and coverage compared to other developing regions.

From a theoretical perspective, the relationship between economic shrinking and social capabilities could manifest in the kind of ‘state transition’ proposed by North, Wallis and Weingast (2009) and supported by Broadberry and Wallis (2017). The region comprises natural states that have undergone political and economic reforms following the failure of autocracy and the debt crisis of the early 1980s. Although that response partly explains the decline in the frequency of economic shrinking, the success of such reforms is not usually reflected in the income convergence process. Using survival analysis, we attempted to provide empirical support for this argument and estimate the weight of the social capabilities that may contribute to the reduction of economic shrinking and therefore aid the process of improving the economy and quality of life.

Using the notion that having fewer economic shrinking episodes promotes income convergence as a point of departure, we found that LAC was likely to experience more shrinking unless the historical dependence on a narrow range of natural resources is overcome. For example, the comparative advantage provided by natural-resource assets has precluded diversification of the technological production for many neighbouring middle-income countries or, in other words, precluded the development of transformative capabilities. Additionally, the democratic system was a response to the failure of autocracy to manage both the economy and broader society. The experience of central banking independence seems to exemplify the possibilities of non-partisan rule, demonstrating how governments tied to

oligarchic elites can be prevented. This enhanced autonomy capability might have counteracted potential risks of backsliding into the politics of vested interests. Furthermore, the inclusion capability has been partially addressed through policies advocating anti-cyclical expenditure policies rather than violence, with increased welfare state funding and expanded social protections that might reduce the likelihood of shrinking in the future.

Although the recent commodity boom contributed to reducing the risk of shrinking in the 2000s, the frequency of shrinking episodes had already begun to decrease during the processes of political democratisation and economic liberalisation. The establishment of more commercial, political and bureaucratic organisations, the reduction of social clashes and the general improvement of policymaking reflect the advancement of certain social capabilities and the increased resilience to economic shrinking in LAC. However, it is doubtful that any country in the region has sufficiently established the doorstep conditions for transition to an open-access society. The lack of significant positive change in transformative capabilities remains a weakness of all LAC countries and constitutes a substantial risk of falling back into a pattern of more frequent economic shrinking episodes.

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Appendix

List of countries in **Table 1: Shrinking and growing in the developing world according to decade**

Asia first tier: Hong Kong, Japan, Korea, Singapore, Taiwan.

Asia second tier: Bangladesh, Cambodia, China, India, Indonesia, Laos, Malaysia, Maldives, Mongolia, Myanmar, Nepal, Pakistan, Philippines, Sri Lanka, Thailand, Vietnam.

Eastern Europe: Albania, Armenia, Belarus, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Estonia, Georgia, Hungary, Latvia, Lithuania, Macedonia, Moldova, Poland, Romania, Russian Federation, Slovak Republic, Slovenia, and Ukraine.

Middle East and North Africa: Algeria, Iran, Iraq, Kuwait, Saudi Arabia, United Arab Emirates, Bahrain, Djibouti, Egypt, Israel, Jordan, Lebanon, Malta, Morocco, Oman, Qatar, Syrian Arab Republic, Tunisia, Yemen.

Latin America: Argentina, Bolivia, Brazil, Chile, Colombia, Costa Rica, Ecuador, El Salvador, Guatemala, Honduras, Mexico, Nicaragua, Panama, Paraguay, Peru, Uruguay, Venezuela.

The Caribbean: Antigua and Barbuda, Bahamas, Barbados, Belize, Dominica, Dominican Republic, Grenada, Haiti, Jamaica, St. Kitts and Nevis, St. Lucia, St. Vincent and the Grenadines, Suriname, Trinidad and Tobago.

SSA: Angola, Congo, Equatorial Guinea, Gabon, Nigeria, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Cote d'Ivoire, Ethiopia, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, South Africa, Sudan, Swaziland, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Table A. Descriptive statistics

VARIABLES	(1) N	(2) Mean	(3) sd	(4) min	(5) max
Country	456	17.17	9.950	1	33
Year	456	1,994	13.35	1,970	2,016
Time 0 (from entry)	456	21.29	13.05	0	46
Time since entry	456	24.57	13.35	1	47
Time 0 (from las shk)	456	0	0	0	0
Time since last shk	456	3.397	3.622	1	23
Shk number	456	8.186	5.256	1	25
Shrinking Dummy	456	0.943	0.232	0	1
GDP pc Growth Prev. 5 Years	450	0.112	2.676	-8.782	6.359
Log of GDP pc Prev. Year	456	7.839	1.145	4.340	10.34
Net Barter Terms of Trade	316	110.4	35.93	50.98	256.8
Natural Resources Assets	399	4.954	6.372	0.00807	34.16
Population (millions)	456	14.70	33.32	0.0404	206.2
Urban Population (% of pop)	456	56.06	19.69	18.45	95.14
Gini Index	335	48.02	6.207	24	60.20
Top 10% Income Share (Urban)	101	40.99	4.671	30.60	51.70
Unemployment Rate	206	9.375	4.592	2.493	22.72
Exports Diversification Index	456	0.289	0.0731	0.185	0.537
Exports Quality Index	456	0.838	0.112	0.519	1.169
Economic Complexity Index	271	-0.192	0.469	-1.128	1.022
Central Bank Independence	407	0.462	0.173	0	0.827
Log of Inflation ($\ln(1+inlf)$)	456	20.01	34.01	-3.556	214.4
Tax Revenue (% of GDP)	234	16.04	5.758	4.839	35.25
Education Expenditure (% of GDP)	315	4.112	1.819	0.905	12.97
Government Expenditure (% of GDP)	220	20.34	6.793	9.319	65.23
Country Risk Index	310	4.443	1.380	1.558	6.981
Latent Conflict Index	310	6.975	1.534	3.750	9.382
Institutional Quality Index	310	4.899	1.757	1.752	8.358
1 if record is to be used; 0 othw	456	1	0	1	1
1 if failure; 0 if censored	456	0.943	0.232	0	1
analysis time when record ends	456	3.397	3.622	1	23
analysis time when record begins	456	0	0	0	0
1970s	456	0.145	0.352	0	1
1980s	456	0.298	0.458	0	1
1990s	456	0.211	0.408	0	1
2000s	456	0.178	0.383	0	1
2010s	456	0.169	0.375	0	1

Table B. Frequency data for shrinking episodes

		LATIN AMERICA																									
Shrinking		22	1972	1975	1976	1978	1980	1981	1982	1984	1985	1988	1989	1990	1995	1999	2000	2001	2002	2009	2012	2014	2015	2016			
Argentina		12	1978	1979	1980	1981	1982	1983	1984	1985	1986	1992	1999	2001													
Bolivia		15	1981	1982	1983	1988	1990	1991	1992	1998	1999	2001	2003	2009	2014	2015	2016										
Brazil		8	1970	1972	1973	1975	1982	1983	1999	2009																	
Chile		5	1981	1982	1983	1998	1999																				
Colombia		8	1975	1980	1981	1982	1985	1991	1996	2009																	
Costa Rica		11	1977	1982	1983	1987	1989	1992	1993	1996	1999	2000	2009														
Ecuador		9	1975	1981	1982	1983	1984	1985	1986	2001	2009																
Guatemala		14	1974	1975	1980	1981	1982	1983	1988	1989	1990	1991	1994	1996	1999	2009											
Honduras		12	1982	1983	1986	1987	1988	1993	1995	2001	2002	2008	2009	2013													
Mexico		18	1970	1972	1975	1978	1979	1982	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	2002	2009							
Nicaragua		11	1974	1975	1976	1977	1983	1987	1988	1989	1995	2001	2009														
Panama		13	1976	1977	1978	1982	1983	1985	1988	1989	1990	1992	1998	2001	2009												
Peru		12	1982	1983	1984	1992	1996	1998	1999	2000	2001	2002	2009	2012													
Paraguay		10	1979	1980	1981	1982	1984	1985	1986	1989	1996	2009															
Salvador		18	1972	1973	1979	1980	1982	1983	1984	1986	1987	1990	1992	1993	1995	1996	1999	2014	2015	2016							
Suriname		11	1971	1972	1982	1983	1984	1990	1995	1999	2000	2001	2002														
Uruguay		23	1971	1972	1974	1978	1979	1980	1981	1982	1983	1984	1985	1989	1993	1994	1996	1998	1999	2002	2003	2009	2010	2013	2014		
Venezuela		Sum	232																								
		THE CARIBBEAN																									
Antigua and Barbuda		10	1992	1995	2001	2002	2008	2009	2010	2011	2013	2016															
Bahamas		22	1970	1971	1972	1974	1975	1981	1986	1990	1991	1992	1993	2003	2004	2007	2008	2009	2010	2011	2013	2014	2015	2016			
Belize		16	1976	1981	1982	1983	1984	1985	1994	1995	1996	1997	1998	2005	2007	2009	2011	2013									
Barbados		16	1975	1981	1982	1990	1991	1992	1999	2001	2008	2009	2010	2012	2013	2014	2015	2016									
Cuba		10	1974	1980	1986	1987	1989	1990	1991	1992	1993	1998															
Dominica		8	1979	1994	2001	2002	2009	2011	2012	2013																	
Dominican Republic		8	1978	1982	1984	1985	1990	1991	2003	2009																	
Grenada		10	1980	1981	1992	1993	2001	2004	2006	2009	2010	2012															
Guyana		15	1972	1977	1978	1979	1982	1983	1984	1986	1988	1989	1990	1998	2000	2003	2005										
Haiti		24	1970	1972	1975	1981	1982	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	2000	2001	2002	2003	2004	2008	2010	
Jamaica		17	1973	1974	1975	1976	1977	1978	1979	1980	1984	1985	1996	1997	1998	2008	2009	2010	2012								
St Kitts and Nevis		7	1991	1998	2003	2007	2009	2010	2012																		
St Lucia		12	1980	1991	1993	1997	2000	2001	2002	2005	2009	2010	2012	2013													
Trinidad and Tobago		16	1971	1980	1983	1984	1985	1986	1987	1988	1989	1992	1993	2009	2011	2014	2015	2016									
St Vincent and the G		7	1973	1974	1975	1987	1994	2009	2010																		
Sum	198																										

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