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SCHOOL OF ECONOMICS AND MANAGEMENT

Social Capability and Resilience to Economic Shrinking

An Innovative Perspective on Growth and the Income Divergence between Sub-Saharan Africa and East Asia & Pacific

Authors:
Emma Hanning
Matilda Persson

Supervisor:
Gunes Gokmen

Department of Economics, Lund University 2021

Abstract

Since the beginning of the 1960's, there has been a widening gap in GDP per capita between the countries in the regions of East Asia & Pacific and Sub-Saharan Africa. By growing more and shrinking less, some but not all, developing countries have deviated from a state of underdevelopment and caught up with the developed world. Moreover, it has been argued that the biggest chance of catching up is found in countries that are technologically backwards, but socially advanced. Accordingly, this paper emphasizes institutions and uses a framework of five social capabilities; *transformation*, *inclusion*, *social stability*, *state autonomy* and *accountability*, to investigate the relationship between social capability, economic growth and economic shrinkage. Social capabilities showed to be significant contributors to GDP, but the returns of improvements were higher in East Asia & Pacific compared to Sub-Saharan Africa. Whether and how social capabilities helped build resilience to economic shrinking remains ambiguous. The study does however encourage further research on economic shrinking as it clearly has growth and development effects.

Keywords: Economic shrinking; social capability; income convergence; shrinking resilience

1. Introduction

Historically, there has been a widening gap between rich and poor countries. Some poor countries have experienced high yearly averages of economic growth and been able to maintain high growth rates over time, whereas others have not to the same extent. As a result, some developing countries have deviated from a tradition of stagnant growth and caught up with the developed world. This has led to income divergence also among developing countries and between developing regions. The increase in growth rates have been the most obvious contributor to this process, but these countries have also had remarkably less shrinking years compared to other developing countries. We will argue that the shrinking phenomenon, that is, when GDP contracts to what it was the previous year, is of equal importance in the study of long-term economic growth but has gained much less attention.

This paper will further examine and use the shrinking approach to understand what characteristics countries need to possess in order to shrink less and outstep stationary states of economic development. Convergence theory does not provide all the tools for understanding regional income divergence, for example the very different development experiences between Sub-Saharan Africa and East Asia & Pacific[1] over the last 60 years. Elaborating upon early ideas of institutions in economic development and recent shrinking research, we use social capability in convergence theory to increase the understanding of why not all developing regions have been able to catch up.

Explaining income divergence across developing regions has proven difficult and calls for a deeper understanding of development. The traditional approach has searched for answers in the classical models focusing on productivity and factors of production as origin to economic growth. Other aspects, such as geographical or cultural differences have also been argued to be the cause of growth differences. An interesting phenomenon is found in North America where a city, Nogales, is cut in half by a fence separating the city into one American and one Mexican part. The two sides of the city have the same climate and weather, their populations share the same history and ancestors and they have to an extent similar music and food culture. However, life on the two sides are rather different. Life expectancy and high school

[1] Countries included in the regions of East Asia & Pacific and Sub-Saharan Africa are based on World Bank classifications

completion is much lower on the south side, and the average household income is just one third of its northern neighbor (Acemoglu & Robinson, 2012), which raises a question of why. The classic approach is often considered too shallow to account for potential deeper sources of growth but neither can geography, culture or ancestry fully explain the different paths of the north and the south side of Nogales, nor the occurrence of income divergence in general. Although this paper is not about Nogales, this example illustrates the complexity of economic development and the challenges of understanding it.

Given that catching up will be impossible without sustained and long-term economic growth, it is crucial to broaden our knowledge about this process; what explains successful transformation or more importantly, the lack thereof. Traditionally the emphasis has been on creating high growth to initiate a significant development process, but this one-sided fixation on growth risks neglecting an important part of development – namely the role of economic shrinking. Over the last decades we have witnessed many Asian countries, in particular the "Asian tigers", take the lead among developing regions in catching up with developed countries. These countries did increase their growth, but they also shrank less compared to other developing countries. More precisely, between 1960 and 2019 the aggregate of East Asia & Pacific experienced only 2 years of shrinking while the region of Sub-Saharan Africa did not share the same successful experience. With 26 shrinking episodes since 1960, many Sub-Saharan African countries remain in a similar stage of economic development as they did decades ago. Figure 1 clearly illustrates the income divergence between these regions. With similar GDP per capita starting points, East Asia & Pacific managed to grow their GDP per capita by 730% compared to Sub-Saharan Africa's 47% between 1960 and 2019.

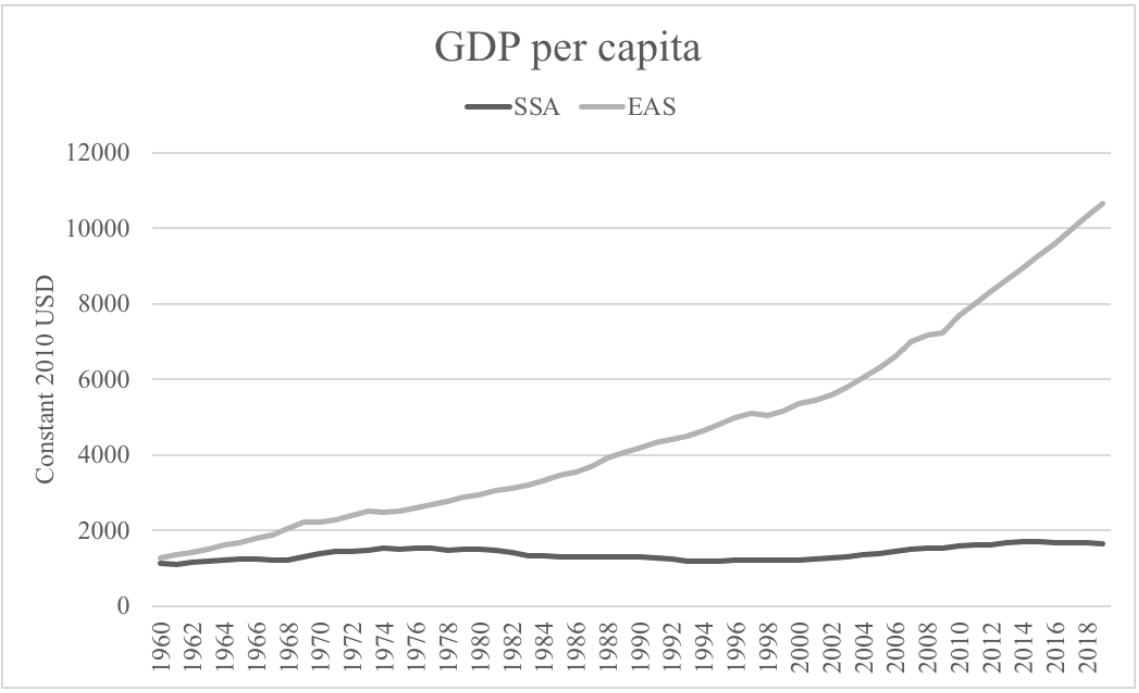


Figure 1: *Income divergence shown by GDP development of Sub-Saharan Africa[2] and East Asia & Pacific[3] over the last 60 years. Source: World Bank (2021a).*

It is clear that long-term economic development and income divergence can not be described by growth alone. Recent works from for example Broadberry & Wallis (2017) and Andersson & Palacio (2018), suggest that the struggle facing developing countries actually does not lie in creating growth but rather in building resilience to economic shrinking. What constitutes this particular ability is unknown, but can hold key understandings of the occurring divergence between developing regions. Institutions and social arrangements are frequently mentioned in the study of development to be of importance. However, as institutions are a broad category including many diffuse and hard-to-grasp concepts, they are sometimes only referred to as the source of inexplicable outcomes. The literature provides a range of arguments of how institutions and social capabilities may lower and mitigate the adverse effects of growth volatility and facilitate sustained development, but due to lack of exact

[2] Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic, Chad, Comoros, Congo, Dem. Rep., Congo, Rep., Côte d'Ivoire, Equatorial Guinea, Eritrea, Eswatini, Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Mali, Mauritania, Mauritius, Mocambique, Namibia, Niger, Nigeria, Rwanda, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe

[3] American Samoa, Australia, Brunei Darussalam, Cambodia, China, Fiji, French Polynesia, Guam, Hong Kong SAR China, Indonesia, Japan, Kiribati, Korea, Dem. People's Rep., Korea, Rep., Lao PDR, Macao SAR China, Malaysia, Marshall Islands, Micronesia, Fed. Sts., Mongolia, Myanmar, Nauru, New Caledonia, New Zealand, Northern Marina Islands, Palau, Papua New Guinea, Philippines, Samoa, Singapore, Solomon Islands, Thailand, Timor-Leste, Tonga, Tuvalu, Vanuatu, Vietnam

definitions, there is little empirical evidence of exactly how social capability interacts with development.

This paper will use a social capability approach and investigate the role of five capability categories for economic growth and shrinkage. Inspired by the work of Andersson & Palacio (2017), we will argue that a country's ability to reduce its shrinking propensity is determined, or partly determined, by its level of social capability. To paraphrase the work of Abramovitz (1995): the greatest potential of catching up is found in technologically backward but socially advanced countries. Firstly, we will account for relevant research and describe how each capability; *transformation*, *inclusion*, *social stability*, *state autonomy* and *accountability* is expected to affect growth and shrinkage. Secondly, we will test the role of social capability in statistical models to expand our understanding of what contributes to GDP and what affects the propensity of shrinking. Looking at the developing regions of East Asia & Pacific and Sub-Saharan Africa, who have had remarkably different shrinking and catching up experiences over the last decades, we will investigate whether the shrinking and social capability approach can be useful to explain the income divergence between them.

2. Previous Research and Background

The widening income gap between East Asia & Pacific and other developing regions over the last decades has raised questions of why not all countries fit the theory of income convergence. The theory's lack of explanatory ability calls for complementation and further research on what characteristics a country or region needs to possess in order to experience a successful transformation. Below we address relevant background and previous research in the fields of economic shrinking and social capability and state our contribution to the topic.

2.1 Growth Volatility

There is much literature on the subject of GDP per capita volatility and economic development. The growth patterns in developing countries tend to be more volatile compared to developed countries, raising uncertainty on future economic development. It is suggested that high volatility in developing countries is due to two reasons; high exposure to exogenous shocks and endogenous shocks related to internal issues, policies and institutions. Exogenous shocks relate to inevitable shocks such as financial crises and natural disasters which all

countries to some extent will be affected by. Endogenous shocks on the other hand, are results of domestic inability to create economic stability. Thus, suggesting that domestic policies can both mitigate and amplify the effects of shocks, they have the capacity to improve a country's ability to handle volatility (Center for global development).

Pritchett (2000) analyzes patterns of economic growth and stresses the importance of volatility and instability in growth analysis. Pritchett means that averages tell us little about differences across countries, as longer periods of growth can be either a steady upward sloping hill or a combination of clifflike shocks followed by equally large recoveries. He finds that growth rates are significantly higher in industrial countries and that the standard deviation of growth rates are higher in developing countries. The highest GDP per capita growth rates (annual %) between 1960 and 2000 is measured in Singapore, Rep. of Korea, Taiwan, Hong Kong and Botswana, where the first four also are known as the "Asian Tigers". The lowest growth rates are measured in Chad, Mozambique, Madagascar, Angola and Somalia, countries that are all located in Sub-Saharan Africa. These empirical observations illustrate regional differences and give reason to believe that the ups and downs in per capita GDP play an important role for long-term economic growth. Although these works point out a very important fact; that high GDP volatility is a more frequent phenomenon in developing countries and the ability to mitigate shocks differs across and within regions, they are missing consistency in the explanations of why.

2.2 The Shrinking Approach

In order to understand economic performance over time, it is important to note that development is a result of both periods of growth and periods of shrinkage. Despite findings on volatile GDP per capita in developing countries, to date most work has focused on the sources of growing and not shrinking. Broadberry and Wallis (2017) have systematically investigated the possibility that improvement in long-term economic performance could be due to a reduction in the frequency and rate of shrinking instead of faster growing. Without neglecting the importance of short-term growth and improved growth rates in the creation of long-term growth, they draw attention to the overlooked role of shrinking in the understanding of economic performance. They find that as economic performance improves over time, short-run economic growth rates along with frequencies of shrinking generally

decrease. They also manage to show how countries need to reduce their frequency of shrinking in order to obtain long-term economic growth.

Broadberry & Wallis (2017) look into some potential factors that could make for a reduction in shrinking and argue, along with many others, that institutional change is one key factor. As their observations extend back to the 13th century, suggested factors are of varying relevance in explaining divergence across developing regions over the last few decades, e.g. technological and demographic change. Recent works by Andersson & Palacio (2017) and Andersson (2018) have aimed to connect the dots of growth volatility, resilience to economic shrinking and social capability. The hypothesis; that social capabilities are significant to reduce economic shrinking and important in understanding the multifaceted concept of development, has the potential to shift focus in the development agenda. Lifting the role of shrinking could open for new ways to look at development and help make development initiatives more effective.

2.3 Social Capability and Development

Neoclassical economists have paid little attention to institutions in the study of economic systems. Some economic behavior has been assumed to be determined by institutions, but they have mainly been seen as facilitators to the neoclassical models by e.g. reducing transaction costs and ensuring perfect information. The role of institutions as efficiency-enhancers, making outcomes closer to models' expectations, is of relevance, but not profound enough to capture the full importance of institutions in economic behavior (Stiglitz, 1995).

The role of social capability in achieving rapid growth can be traced back to the work of Ohkawa and Rosowski (1973). Drawing attention to institutional innovation and capability of importing and adapting to more advanced technology, Okhawa and Rosowski look beyond the mere economic factors in their analysis of the Japanese growth spurt after the World War II. Elaborating upon these ideas, Abramovitz (1995) introduces social capability in convergence theory as a possible explanation to why some technologically backward countries manage to undergo rapid growth and catch up while others do not. Social capability is described by Abramovitz as the "economic characteristics of people and institutions" along with "political institutions and people's social attitudes". The main idea is that developing

countries that are socially advanced but technologically backwards will have an advantage to efficiently convert to newer technologies developed by technologically advanced countries, and thus have a better chance of improving growth.

Development economists are aware that economic functions are affected by political, institutional and social factors, but that impact differs in character between less and more developed countries. To study the interaction of non-economic and economic forces in development and make cross country studies, there is need for empirical knowledge. However, there is limited empirical evidence on social capability and economic growth, possibly due to the challenge of quantifying the concept. What seems to be commonly agreed upon, is that a country's social capability is a complex composition of subtle and difficult-to-define factors that operate in different ways in different countries.

The early and extensive work of Adelman & Morris (1967) defines 41 social capability indicators and classifies a sample of 74 developing countries over the period 1957-1962. Using a large sample and well motivated indicators, this index was groundbreaking in social capability research and has inspired further quantification attempts. Classifying countries over multiple decades according to the Adelman & Morris index is however a very challenging and ambitious project. It could also give ambiguous results when trying to trace changes over time due to the many dimensions included, and will thus not be explicitly used in this paper. The works of Andersson & Palacio (2017) and Andersson (2018) provide a framework of five capability categories to cover for the social and institutional aspects of development; levels of complexity and diversification in the economy (transformation); equal access to economic opportunities (inclusion); capacity of conflict resolution (social stability); credible and functioning government commitments (state autonomy) and transparent governance and quality provision of public goods (accountability). By strengthening these interrelated capabilities, there is reason to believe that countries could build resilience against economic shrinking.

The quantification attempt that is most relevant to this paper is the social capability index put forward by Palacio (2018) (see also 3.3). The social capability index merges capability indicators into a composite index that can be used to rank the capability performance for a sample of countries over time. The index can be used as a tool in understanding why some countries grow faster than others and be useful when there is a need to quantify social

capability. Although the index is empirically simple and convenient to use, countries are being compared relative to one another in a way that does not distinguish between capabilities or make countries comparable other than within the sample. As all capabilities are weighted equally, it also does not capture the actual contribution of each indicator to a country's social capability. Neither do we find the ranking aspect of the social capability index useful as we are observing changes over time. For example, as changes in rank reflects a relative change, a large leap in rank does not necessarily account for a large absolute improvement in development.

Thus, in this paper we will elaborate upon the idea that social capability is contributory to economic growth in the way that it helps build resilience to economic shrinking. As both a reduction of shrinking and social capabilities seem to be important in order to generate significant growth and outstep economic stationarity, we want to examine their relationship in the context of income divergence across East Asia & Pacific and Sub-Saharan Africa. Economic shrinking is a relatively new approach within the field of economic development and much of it is still unexplored. As focus to date has mainly been on growth, the properties of what exactly build resilience to shrinking are mainly unknown and need to be further investigated. This paper uses a long run perspective on growth and two developing regions with very different shrinking experiences as basis for the study. First, we present theoretical arguments of the five capability aspects to further establish social capability in the growth and shrinking discussion. Second, we statistically test the relationship between these capability categories and growth and shrinking respectively. Through four OLS models and a sample of 19 developing countries in Sub-Saharan Africa and East Asia & Pacific from the 1960s to today, we will take each capability separately into account instead of using an index. As well as accounting for marginal differences across regions we also introduce a way to test whether social capability could reduce the shrinking propensity.

3. Theory

3.1 Convergence Theory

Although developing countries generally experience lower income levels, convergence theory suggests that follower countries have larger potential of growing compared to the productivity leader, and will catch up over time. According to Abramovitz (1995), the theory of catching up and growing potential in developing countries stems from "the advantage of backwardness" concretized in three characteristics, namely; (i) the ability to take larger technological leaps by replacing obsolete technology with already existing instruments developed in more advanced economies, (ii) going from low to high returns to capital investments as a result of larger technological leaps, and (iii) higher productivity achieved by transferring redundant labor from agricultural sectors to higher productivity occupations in the expanding industrial sector. This would then hypothetically narrow the gap between follower countries and productivity leaders and a catching-up effect would be expected. Apart from the Asian Tigers, catching-up by developing countries is rarely seen in the real world, making the theory of catching up questionable and in need of refinement.

Abramovitz (1995) also addresses possible limitations to growth potential. Necessary preconditions to prosper are functioning trading and financial regimes, but there are also other aspects that could affect countries' growing potential. Scarcity of resources and land is one reason countries could be held back in terms of growth, as it prevents them from obtaining higher productivity levels. It is also assumed that developing countries efficiently can exploit the technology found in leading countries, but this assumption does not hold in most cases. He then emphasizes the importance of social capabilities to economic development, identified by him as a country's technical competence and its financial, industrial, commercial and political institutions. To date there exist no agreed upon definition of the term, as social capabilities are attributes of organizations and people, but the role of them for economic development has been further examined by many and has come to play an increasingly important role in the explanation of income divergence across countries.

However, it is not as simple as stating that growth rates will infinitely continue to increase as poorer countries continue to develop. Excluding developing countries, the abovementioned

work of Pritchett (2000) finds the lowest GDP per capita growth rates between 1960 and 2000 in New Zealand, Switzerland, United States, Sweden and Australia, all of which are considered to be in the higher end of the development spectra. An explanation to why can be found in the neoclassical, Nobel prize winning "Solow growth model". The model implies that as countries reach a particular stable point in development there will be no further growth because all savings are put towards maintaining the output level. The steady state is determined by the population growth rate, the capital depreciation rate and the savings rate. Thus, countries with the same rates will have the same steady state and converge in the long run. As for developing countries, the model shows that growth rates will temporarily increase with a rise in capital investment (the capital to labor ratio goes up). However, the returns to investment are diminishing, explaining the reversion to lower growth rates when approaching the steady state (Solow, 1956). Figure 2 shows how different stages of development are associated with different growth rates. The largest potential of catching up is found in the stage of ongoing development, clearly exemplified by the Asian tigers' development processes.

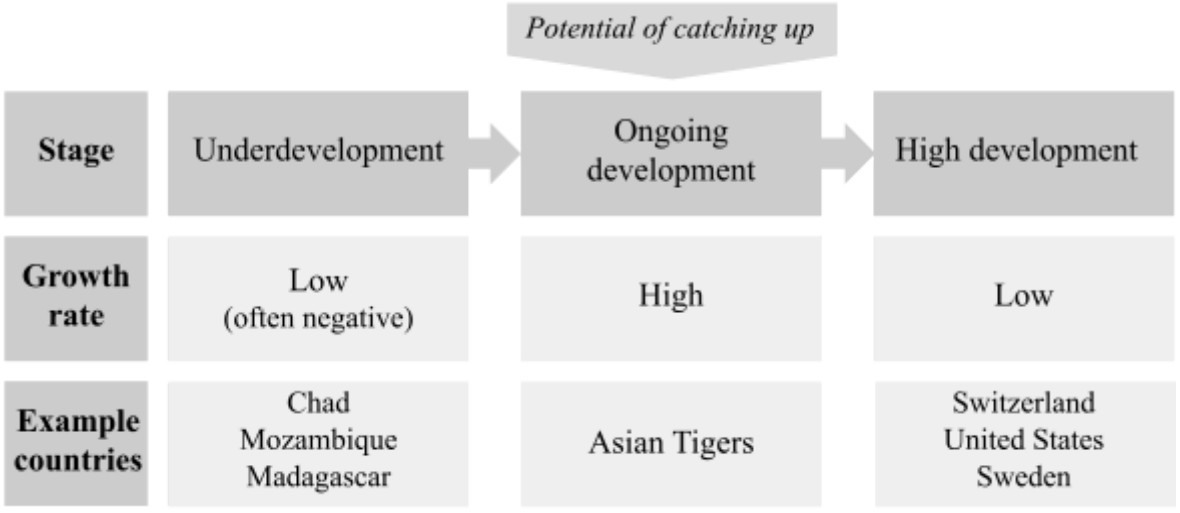


Figure 2: *Growth rates associated with different stages of development, illustrating what the development process has looked like up until the year of 2000. Example countries from Pritchett (2000).*

As there are two types of low growth rates related to different stages of development it is important to distinguish between them. As the countries of interest for this paper are either in a stage of underdevelopment or in the process of approaching high development, we will for the purpose of this paper be restricting ourselves to the first two types of growth rates; low growth related to underdevelopment and high growth related to ongoing development.

3.2 Social Capability

The framework of social capability used in this paper will be based on the Andersson (2018) hypothesis of in total five capability categories to create resilience against economic shrinking; *transformation, inclusion, social stability, state autonomy* and *accountability*. In the following section we will explain why these are expected to have an effect on economic growth and how they are related to economic shrinking.

3.2.1 Transformation

Transformation signifies the change in economic structures and the move towards higher value adding economic activities (Andersson 2018). Possible reasons for higher shock exposure in developing economies are that poorer countries often specialize in fewer and more volatile sectors, leaving them more vulnerable to sector specific shocks. Poorer countries do experience more frequent and severe shocks and there is evidence that these fluctuations are highly correlated with the shocks related to the sectors countries specialize in. In the first stages of development, countries seem to move towards less volatile sectors and sector specific shocks seem to decrease. The key idea is to mitigate the effect of sector specific shocks by using larger varieties of inputs. That way, the economic effect of one particular input being hit by shock and the likelihood of shrinking will be smaller as each input now constitutes a smaller share of the final output (Koren & Tenreyro, 2007).

To create long term economic growth, agricultural transformation is a significant factor. Historically, this has been a driving force in creating a more diversified and complex economy, both needed to build shock resilience. By effectivising the agriculture sector, less resources are needed to create the same amount of agricultural goods and excess labour and capital can be reallocated into higher value adding sectors such as industry and service sectors (Andersson & Palacio, 2017). The alternatives to agricultural employment are suggested by Johnston & Mellor (1961) to be important for the transformation process as an improved GDP only will appear if the alternative sector is more profitable. Shifting away from a predominant agriculture sector is a good measurement of transformation but a rather slow process due to for example frictions of labor movement. Transformation will make the economy less vulnerable to changing demands and weather conditions and thus create a more resilient economy.

3.2.2 Inclusion

To be able to make best use of the economic incentives created by a country, there needs to be a high level of inclusion with equal opportunities for all citizens to participate in economic activities. There are multiple aspects of societal inclusion, but most relevant to economic growth is competitive, free entry markets and making full use of people's capacities to ensure high productivity (Andersson, 2018). Developing countries are often characterized by high inequality levels, taking shape as winning and losing groups as results of change in the economy. Poverty and unemployment is not only a problematic state of low income and productivity, but has a two way causality effect with capability deprivation (Sen, 1999). A noninclusive economic environment will thereby have consequences beyond low income levels. Examples are the "poverty trap" referring to a negative spiral of poverty and underdevelopment leading to even more poverty and underdevelopment, and limitations on both willingness and possibilities for small businesses to create capital and establish themselves in the formal economy (Todaro & Smith, 2015; de Soto, 2003). Inclusion can also manifest itself in the distribution of land and access to productive resources, which has a negative empirical association with growth (Alesina & Rodrik, 1994). A larger spread of income across a country's population and businesses would not only generate more ways to create growth, but also diminish the economic risks of isolating income to one group or sector.

A commonly used measurement of income inequality is the gini coefficient that measures the spread of income across the population. A value of 0 means that the income is perfectly distributed across the population and a value of 1 that one person alone receives all the income (OECD, 2021). A common scenario in developing countries is having large parts of its population living in absolute poverty while the assets of value belong to a small elite. These countries would perform on the higher end of the gini scale and according to previous arguments, a lowering of the gini coefficient would have a positive effect on growth and reduce the shock risks.

3.2.3 Social stability

Social stability refers to the capacity of conflict resolution and the handling of violence. One obvious consequence of social instability is the high need of government resources to prevent outbreak of destructive conflicts. As government resources in developing countries are often

already scarce, little government capacity will be left to put towards promoting development policies (Andersson, 2018). Conflicts can potentially also lead to destruction of human and physical capital, resulting in irreversible costs and waste of potential economic gains.

One way that social stability affects the economy is that countries with social unrest and conflicts appear less credible and attract less foreign direct investments. The typical way to counter large fluctuations and prepare for periods of economic shrinking are through macroeconomic policies and capital flows; borrow when times are bad, and pay back when times are good. However, the opposite is often true for developing countries and investment flows tend to be highly procyclical. One potential reason is that countries appear to be more creditworthy in good times than in bad (Center for global development). Thus, when most needed, governments are deprived of one important macroeconomic instrument to mitigate the effects of economic shrinking which in turn will affect growth.

3.2.4 State autonomy

State autonomy refers to the state's independence of decision making. Without some degree of autonomy, states could become corrupted by merchant interests instead of acting independently in favor of the general interests of the society (Carruthers, 1994). Important aspects are for example the ability to efficiently collect taxes and keep vested interests in check through autonomous judicial functions (Johnson & Koyama, 2017). By having society's most vulnerable groups' interests in mind, autonomous decision making would contribute to a higher degree of inclusion. Growth and development is also influenced by private agents, market economies and a strong civil society, which are in need of operating space provided by the government.

With frequent exposure to economic shocks, the monetary area is of great importance in developing countries to mitigate adverse effects. Seigniorage – the difference between the face value of money and its production cost – is a way of raising government revenue, not rarely used by poor countries. As printing money is a profitable activity, it is often monopolized by the state to prevent money printing and inflation rates from getting out of control (Buiter, 2007). Inflation also has distributional effects, and the burden of inflation lies predominantly on the poorest (Erosa & Ventura, 2002). Through fiscal policy and tax structure, states are in power to alter income distribution and promote equality. In order to obtain balance between equity gains and efficiency losses due to further taxation, changes are

suggested to be beneficial to the poorest and simultaneously not reduce incentives for the richest to save and invest (Diamond & Mirrlees, 1971).

The monetary policy framework *inflation targeting* is a strategy to be implemented by emerging economies with the goal to obtain stable and low inflation along with discipline and transparency in the monetary area. There is evidence that countries that have adopted the inflation targeting system have strengthened their central banks autonomy and experienced rapid technical and institutional improvements. When implementing the inflation targeting framework, governments are faced with a trade off. As the monetary authority is given the means to keep the inflation down, it will be at the expense of seigniorage revenue. To compensate for inflation tax losses, governments are encouraged to improve the tax collecting strategy and an enhancement in the tax system would be expected (Lucotte, 2012). The implementation of inflation targeting policies is a process of institutional reforms and a move towards economic autonomy. Autonomous governments promote a general growth agenda and not the agenda of specific interests, which will enhance sustainable growing and reduce the likelihood of shrinking.

The evidence from the inflation targeting strategy and the unequal burden of the inflation tax is speaking in favor of a negative relationship between high inflation and eminent growth. However, the empirical evidence on inflation in development economics is mixed. Carvalho et. al. (2017) question the understanding of inflation control as a measure of central bank credibility, but emphasize its part in the broader sense of understanding development. Inflation control enhances a country's capability of catching up and can be a useful tool for income redistribution.

3.2.5 Accountability

Accountability addresses the quality of governance and the government's ability to provide public goods for its citizens. A key aspect of accountability is consequently the legitimacy of the government among the governed, in other words the taxing among the ones being taxed. The money spent on public goods measured as a ratio of GDP or total government spending, is a good measurement of accountability. The ability and willingness to provide public goods and services for its citizens is in many developing countries a good indicator of the overall capacity of the government. Many developing countries do however struggle with low rates of tax revenue as a percentage of GDP compared to developed countries (Andersson, 2018).

This is often due to under-taxing and tax evasion, making it hard for low-income countries to honor the "social contract" (Andersson, 2018; Palacio, 2018). Appropriate use of tax revenue is therefore of great importance in poorer countries as it affects the incentives to pay. However, an increase in tax comes with larger difficulties in developing countries as provision of public goods, and thus accountability, is already generally low (Andersson, 2018).

The attainment of accountability is important, but so are the outcomes. Thus, a way to capture accountability is to look at public health and measure its outcomes. Improvements in child mortality rates which drastically raises life expectancy are empirically shown to have a strong initial relationship with GDP per capita. However, this relationship becomes less distinct after a level of $8000 GDP per capita and countries with similar life expectancies but different GDP rates can be observed (Palacio, 2018; Deaton, 2013). Child mortality is something that can be lowered immensely with relatively small measures but is highly dependent on public action. Thus, the first few initiatives to improve public health are of great importance as they immediately improve life expectancy which seems to be related to higher income. Child mortality can be seen as a direct measurement of the outcomes of public health spendings and it is reasonable to assume that countries with lower child mortality rates have better overall healthcare and a healthier population (Deaton, 2013). Population health is also tightly interrelated with education attainment, both having a positive effect on economic development. Healthier children have a higher school attendance and better learning capacity, increasing the returns to GDP from both healthcare and educational investments. Higher academic levels and larger life spans will increase the workforce capacity to improve development and GDP levels (Todaro & Smith, 2015).

3.3 The Social Capability Index

With the absence of an agreed-upon definition of social capability and its relatively recent entry in the field of economics, the empirical basis on social capability is fragmentary. The social capability index (Palacio, 2018) is considering four aspects of social capability (first presented in Andersson & Palacio, 2017). A set of indicators are motivated to quantitatively capture each capability respectively. Each capability is measured with a maximum of two indicators for a sample of 27 developing countries between 1990 and 2010. The outcome is a composite index balancing all indicators equally, where countries are ranked within the

sample from 1 to n. The lower the measured value of the indicator, the higher the expected stage of development and thus the higher the rank. The indicators used are summarized below:

Capability:	**Indicator:**
Transformation	Share of agricultural employment
Inclusion	Unemployment + net gini
State autonomy	Inflation
Accountability	Child mortality

The Social Capability Index is useful for overcoming the challenge of quantifying the concept of social capability. It is also aligned with the definition of social capability used in this paper, making the translation processes easy.

3.4 Economic Performance

One way of incorporating the contribution of both shrinking and growing in the analysis of economic development is by looking at Economic Performance (EP) over longer periods of time. The economic performance measurement consists of the frequencies of growth and shrinkage and the magnitudes of them respectively, over a specific time period specified as follows (Broadberry & Wallis, 2017):

$$EP = f(+) * m(+) + f(-) * m(-)$$

- $f(+)$ is the frequency of growing years
- $m(+)$ is the average growth rate (growing magnitude) over years of positive growth
- $f(-)$ is the frequency of shrinking years
- $m(-)$ is the average shrinking rate (shrinking magnitude) over years of negative growth

The frequency of growing can be rewritten as $1 - f(-)$, reducing the component factors from four to three:

$$EP = [1 - f(-)] * m(+) + f(-) * m(-)$$

This identity will be used to account for the contribution of shrinking to economic performance as well as distinguish between shrinking frequency and shrinking magnitude. The economic performance measurement is reflective of GDP but is able to capture decennial trends in the ups and downs in economic development.

4. Hypothesis

We have now described how growth volatility occurs more frequently in developing countries, but that it is of varying nature across regions. The phenomenon of economic shrinking seems to be more commonly occurring in developing regions that have not had a significant catching up experience. With similar GDP per capita starting points, East Asia & Pacific managed to grow their GDP per capita by 730% compared to Sub-Saharan Africa's 47% over the last 60 years. Over the same time period, Sub-Saharan Africa has experienced 26 years of shrinking and East Asia & Pacific 2 (see appendix, figure 5 & 6). As countries seem to have a very large shrinking problem, perhaps even larger than the problem of creating growth, we see that the shrinking phenomenon is motivated enough to be investigated.

We have also presented arguments in favor of the institutional and social importance to economic growth. It is not clear exactly how these operate beneficial to the development process, but an appealing idea, phrased in Andersson & Palacio (2017) is through creating resilience to economic shrinking. An addition to this hypothesis based on theory on shock types and the results from Broadberry & Wallis (2017), is the emphasis on shrinking related to endogenous shocks (for example poor institutions and policies). We argue that endogenous shocks are better captured by shrinking frequency, as they are related to the domestic ability to tackle smaller setbacks. Exogenous shocks are also captured by shrinking frequency but are more related to magnitude as the effects of exogenous shocks often make multiple

countries victims regardless of institutional power. Thus, shrinking magnitude is of smaller relevance to this study.

4.1 Questions

We will elaborate upon the hypothesis that social capability could benefit long-term growth by reducing the likelihood of economic shrinking. We also ask ourselves whether this approach could be relevant and perhaps necessary addition to the classical convergence theory for the regional income divergence between East Asia & Pacific and Sub-Saharan Africa.

(1) How is social capability related to growth and the propensity of economic shrinking?

(2) Can the social capability approach help explain the income divergence between Sub-Saharan Africa and East Asia & Pacific from the 1960s to today?

According to theory and the reasoning above, we would expect social capability to have a positive effect on GDP per capita as well as reduce the likelihood of economic shrinking. We would also expect the more successful growth experience of the East Asian & Pacific region to be explained by a higher ability to create resilience to shrinking compared to the Sub-Saharan African region. We believe and expect that this ability is determined, or partly determined, by domestic social capability levels.

5. Methodology and Data

To test whether and how social capability explains economic shrinking, a series of regressions was run using social capability indicators as explanatory variables. The economic performance measurement was also used to capture decennial trends in the components of the EP identity. With support from the theoretical background and the suggested indicators in the social capability index, explanatory variables to represent each capability were chosen; share of agricultural employment, gini index estimate, major episode of political violence, inflation and child mortality. Sub-Saharan Africa and East Asia & Pacific were the regions of interest to this study as they had relatively similar GDP in the beginning of the 60s but then very different economic development. A sample of 10 countries were chosen from Sub-Saharan Africa and 9 from East Asia & Pacific, the latter containing three of the Asian tigers (see appendix, table 5). In a panel format, data was collected for each country over the period 1963-2018.

The GDP per capita, growth, inflation and child mortality data were collected from the World Bank (2021a-d). Other data sources used were the GGDC 10 sector database (Timmer et. al., 2015), Standardized World Income Inequality (Stolt, 2019), and Center for Systemic Peace (2020). As our time period of interest reached back to the 1960, we encountered limitations in the choice of data and sample. Many, primarily African, countries became independent and free from colonization in the beginning of the 60s. The removal of the first few years of time observations was made to account for potential disruptions in the data due to lack of state independence. The size of the sample and the choice of sample countries was mainly determined by the data availability on share of agricultural employment. This indicator had the fewest observed countries over the desired time period. A larger sample would have been preferred but was not possible to obtain to still satisfy the desired properties of this study. The social capability index used the combination of unemployment and net gini as measurement of inclusion. However, data on unemployment was almost non-existing over the first decades of our intended time span. It was also very scarce, especially across Sub-Saharan Africa. Hence why the aspect of inclusion was limited to be captured by the gini coefficient only.

What was not included in the social capability index was the aspect of social stability. However, this is added by Andersson (2018) to be an aspect of equally large importance in a

country's set of social capabilities. Quantitative measurements for this particular capability were not suggested. Considering available data supported by the theory, we propose Major Episode of Political Violence (MEPV) from data found at the Center for Systemic Peace as an indicator. A dummy was created for each year with the presence of societal and interstate conflict to capture stability. We would expect a higher probability of shrinking in years with the presence of conflict.

Empirical studies trying to capture real world phenomenons are bound to encounter unpredictability and limitations. The choice of sample, variables and time period were made to minimize missing observations as too many missing observations would make the models less representative and diminish the validity of the results. Even though these precautions were taken, there were still missing observations in our data. However, it was not of such magnitude that it should have had decisive effects on our results. The same reasoning was applied for the found presence of multicollinearity. Institutions and social capabilities come with measurement difficulties. Firstly, the quantitative indicators capturing social concepts are naturally indirect. Secondly, it should be taken into account that developing countries can encounter larger difficulties collecting data than more advanced economies due to limited resources. The results should therefore be interpreted with some extra caution. It is however worth noting that the data used was collected from data sources that actively work to ensure high quality data.

5.1 Models

First we examine the relationship between social capability and income convergence by using GDP as the dependent variable. Then we make a distinction between frequency and magnitude of economic shrinking as did by Broadberry & Wallis (2017). As previously argued, the frequency of shrinking is the more relevant measurement of shrinking to this paper. Using the indicators from the social capability index and including social stability, the explanatory variables were determined.

DEPENDENT VARIABLES		
Variable observed:	**Indicator:**	**Name of variable:**
GDP performance	Logarithm of GDP per capita	LogGDP
Frequency of shrinking	Dummy taking the value 1 for every shrinking year	Fr

EXPLANATORY VARIABLES		
Capability:	**Indicator:**	**Name of variable:**
Transformation	Share of agricultural employment (% of total employment)	Agr
Inclusion	Gini index estimate (equivalised household disposable income, post-tax, post transfer. Square root scale)	Gini
Social stability	Dummy taking the value 1 for each year with presence of a major episode of political violence (societal and interstate)	MEPV
State autonomy	Inflation (GDP deflator, annual %)	Inf
Accountability	Child mortality rate (under 5 years, per 1000 live births)	Mort
	Logarithm of child mortality rate (under 5 years, per 1000 live births)	LogMort

The OLS models are formulated as follows:

(1) $$LogGDP_{i,t} = \beta_0 + \theta_t + \beta_1 Agr_{i,t} + \beta_2 Gini_{i,t} + \beta_3 MEPV_{i,t} + \beta_4 Inf_{i,t} + \beta_5 LogMort_{i,t} + \varepsilon_{i,t}$$

(2) $$Fr_{i,t} = \beta_0 + \theta_t + \beta_1 Agr_{i,t} + \beta_2 Gini_{i,t} + \beta_3 MEPV_{i,t} + \beta_4 Inf_{i,t} + \beta_5 Mort_{i,t} + \varepsilon_{i,t}$$

where $i = 1,...,19$, denotes the country observed from our sample of countries from Sub-Saharan Africa and East Asia & Pacific at time t, representing the time dimension between 1963 and 2018. β denotes the variable coefficient, ε the error term and θ is the time specific effect. To account for potential regional differences, a dummy variable to indicate location in the region of Sub-Saharan Africa was used to create interactive variables with all capability indicators. The interaction variables are added to the OLS models in regressions (3) and (4) where γ is the interactive variable coefficient.

(3) $$LogGDP_{i,t} = \beta_0 + \theta_t + \beta_1 Agr_{i,t} + \beta_2 Gini_{i,t} + \beta_3 MEPV_{i,t} + \beta_4 Inf_{i,t} + \beta_5 LogMort_{i,t} + \gamma_1 Agr\_SSA_{i,t} + \gamma_2 Gini\_SSA_{i,t} + \gamma_3 MEPV\_SSA_{i,t} + \gamma_4 Inf\_SSA_{i,t} + \gamma_5 LogMort\_SSA_{i,t} + \varepsilon_{i,t}$$

$$(4)\ Fr_{i,t} = \beta_0 + \theta_t + \beta_1 Agr_{i,t} + \beta_2 Gini_{i,t} + \beta_3 MEPV_{i,t} + \beta_4 Inf_{i,t} + \beta_5 Mort_{i,t} + \gamma_1 Agr\_SSA_{i,t} + \gamma_2 Gini\_SSA_{i,t} + \gamma_3 MEPV\_SSA_{i,t} + \gamma_4 Inf\_SSA_{i,t} + \gamma_5 Mort\_SSA_{i,t} + \varepsilon_{i,t}$$

5.2 Specification tests

In the following section, we discuss alterations and corrections to our models related to multicollinearity, fixed or random effects, heteroskedasticity and autocorrelation. Testing and correcting for any discrepancies or misspecifications are important for regression accuracy and getting consistent and unbiased results.

Through a correlation matrix, all models were tested for multicollinearity. Some level of multicollinearity among interaction terms is normal and expected and does not imply model misspecification. However, a strong correlation (>|0.8|) increases the standard errors and makes estimates more imprecise and less efficient. A correlation matrix showed low multicollinearity for model 2, but some values of higher correlation were found among the variables in model 1 (see appendix tables 1 & 2). The correlation found between Agr and Mort is probably due to a common dependence on a third variable – time. We corrected for the potential disruptions of this by running them in two separate regressions. Occurence of high correlation was also found in model 3 and 4 (see appendix, tables 3-4) between the interaction variables. The cases where variables were based on each other were ignored (for example Inf and Inf_SSA) and we also did not correct for high correlation found between interactive variables. We are aware that our estimates might to some degree be affected by multicollinearity but the results will remain unbiased and consistent.

To determine whether to use fixed or random effects, a Hausman test was performed. For models 1-3 we rejected the null hypothesis, meaning that the random effects model will be subject to unobserved heterogeneity and that fixed effects would be more appropriate (Dougherty, 2016). The fixed effects models have the disadvantage of flattening the effect of variables that changes little over time, the gini variable is one example. Thus, random effects regressions for models 1-3 were included for reference. For the fourth model, the test showed random effects. A time fixed effects tests was also performed, indicating that all models were in need of such (denoted θ_t in our models). For the regressions included as references time fixed effects were not added.

The models also needed to be tested for heteroskedasticity. Models suffering from heteroskedasticity have an inconsistent variance of their error terms, leading to inefficient coefficients and underestimated standard errors (Dougherty, 2016). A Wald test and a Likelihood-ratio test was performed and indicated the presence of heteroskedasticity in all regressions. Heteroskedasticity is adjusted by adding robust standard errors. Another problem often facing panel data is autocorrelation, also called serial correlation. Autocorrelation occurs when the error term for one time period is correlated with another (Dougherty, 2016). To test for this, a Wooldridge test was performed which showed presence of autocorrelation in all models. As our regressions suffer from both autocorrelation and heteroskedasticity, cluster robust standard errors were added to satisfy all underlying assumptions for a correctly specified model.

Multiple regression variations were run for each model to account for different statistical issues and ensure that the results tell a consistent story. For model 1, five regression variations were run to observe coefficient changes as regressions become more stringent going from reg 1.1 to reg 1.5. 1.1 and 1.2 were random effects models with time fixed effects added on the latter to avoid a potential "flattening out" effect on our stationary variables. Reg 1.3 and 1.4 were splits of reg 1.5 to take into account potential estimation inefficiency due to correlation between Agr and Mort. Corresponding regression variations were made for model 3 which included the interactive variables. As there was no presence of high multicollinearity in models 2 and 4, only the regressions with fixed and random effects variations were conducted.

6. Results

Previous studies have shown a negative relationship between the social capability index and growth, meaning the better the total composition of capabilities, the better the GDP performance. This section will present the results found from testing the capability indicators in a non-index form on both GDP and shrinking frequency over a 60 year time period. This is a first attempt to statistically investigate whether social capability is part of the ability to build resilience to economic shrinking. The economic performance and panel regression results are first presented, followed by a discussion of their implications.

6.1 Economic performance results

First of all, we confirm that frequency is of larger importance to this study than magnitude. By simulating the economic performance of Sub-Saharan Africa using the East Asian frequency and magnitude of shrinking respectively, the most improvement is gained through a replacement of shrinking frequency. The actual economic performance of Sub-Saharan Africa (SSA) is used for reference (see figure 3). This shows that in order for Sub-Saharan Africa to mimic the catch-up process of East Asia & Pacific, they would have been more successful by shrinking less often than by less.

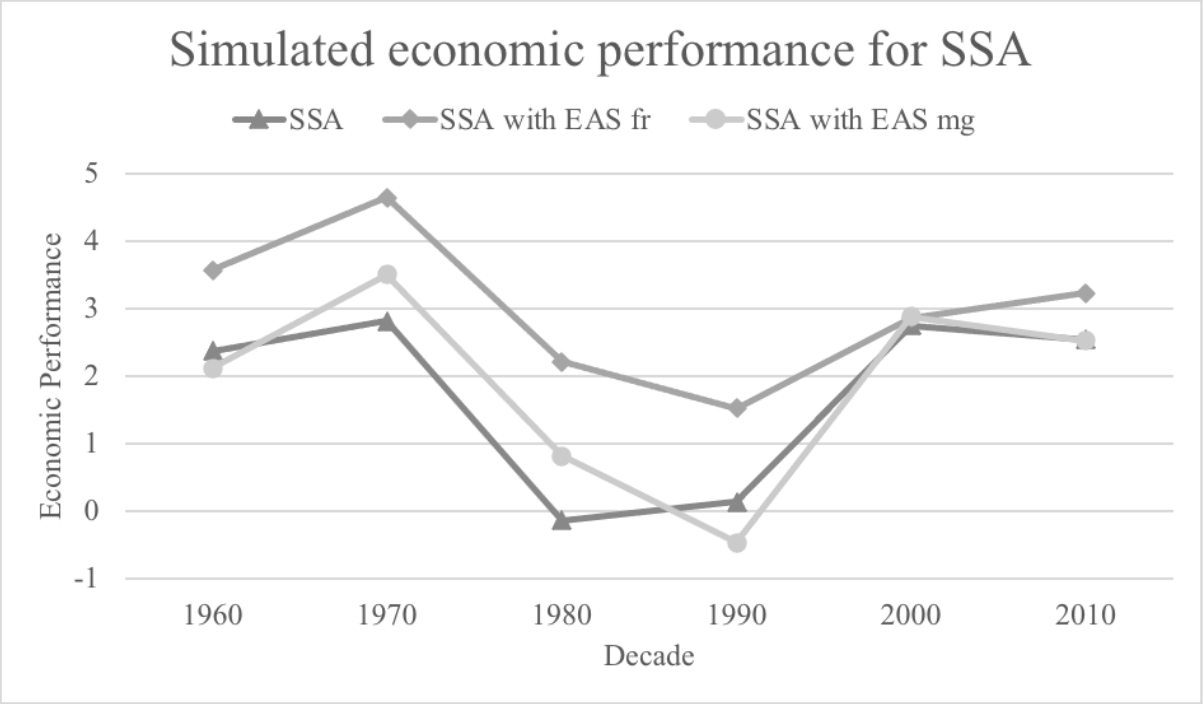


Figure 3: *The economic performance of Sub-Saharan Africa if East Asian shrinking properties. Source: Authors' own calculations based on World Bank data (World Bank, 2021b).*

Secondly, figure 4 shows that the average growing rates in years of positive growth are lower in Sub-Saharan Africa but do not differ much from East Asia & Pacific considering multiple recoveries from negative rates. This does not suggest that the growth magnitude does not matter, but shows that countries have quite similar ability to generate growth in non-shrinking years. They have however very different ability to uphold resistance to shrinking as East Asia & Pacific has shrunk significantly fewer times than Sub-Saharan Africa.

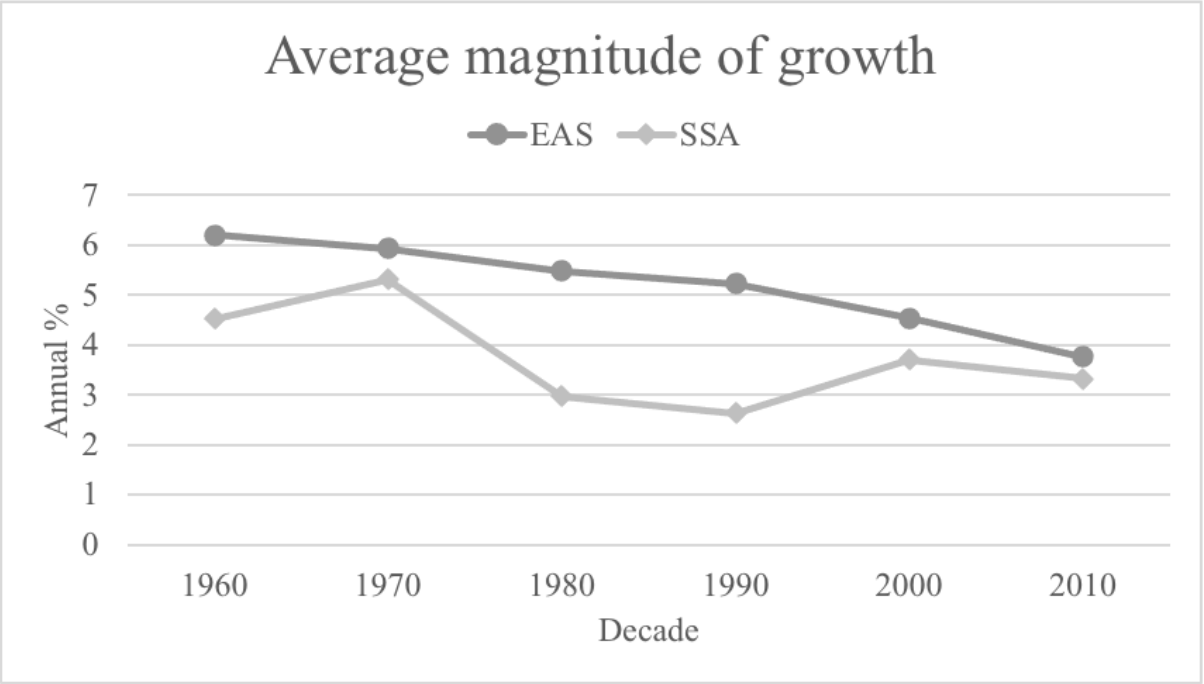


Figure 4: *Growing magnitude per decade of Sub-Saharan Africa and East Asia & Pacific. Source: Authors' own calculations based on World Bank data (World bank, 2021b).*

6.2 Panel regression results

To better understand the relationship between social capabilities and economic outcomes, GDP was set as the dependent variable. We would expect all social capability indicators to be significant for the GDP outcome and have negative coefficients to indicate that an increase in a capability indicator would have a negative effect on GDP. Agricultural employment and child mortality showed to be highly significant and negative across all regression variations but with varying coefficient sizes. The Gini estimate had even and positive slope coefficients throughout all regressions, but was only statistically significant in reg 1.3 and 1.5. The inflation rate was only statistically significant in the random effects models but the coefficients observed were very small. MEPV showed to be insignificantly negative across all regressions. It is important to note that the greatest emphasis should be put on the last three regressions when studying the model 1 results as they are corrected according to the specification tests.

Regression results model 1:

GDP as the dependent variable

Log GDP	**Reg 1.1**	**Reg 1.2**	**Reg 1.3**	**Reg 1.4**	**Reg 1.5**
Agr	-1.161*	-3.176***	-2.731**		-1.411*
	(0.068)	(0.000)	(0.032)		(0.081)
Gini	0.0287	0.0186	0.0500*	0.0222	0.0354*
	(0.178)	(0.131)	(0.065)	(0.390)	(0.092)
MEPV	-0.0603	-0.0841	-0.0405	-0.0591	-0.0683
	(0.181)	(0.581)	(0.396)	(0.242)	(0.138)
Inf	0.00161***	0.00394**	0.000444	-0.00000780	0.000841
	(0.005)	(0.010)	(0.552)	(0.964)	(0.155)
Log Mort	-0.583***	-0.551***		-0.878***	-0.763***
	(0.000)	(0.002)		(0.000)	(0.000)
Observations	596	596	596	707	596
R^2		0.924	0.802	0.895	0.902
Fixed Effects	NO	NO	YES	YES	YES
Time Fixed Effects	NO	YES	YES	YES	YES

p-values in parentheses: $^{*}p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$

Model 2 tested whether social capability had an affect on the probability of shrinking. We would expect all variables to have positive coefficients, indicating that a rise in the explanatory variable would increase the likelihood of having a shrinking year. Inflation and child mortality was significantly positive across all regressions at a high significance level. The gini estimate and agricultural employment was significant only in the random effects models. However, the agricultural employment variable deviated from the trend of positive effects with strongly negative coefficients. MEPV showed no statistical significance in any of the regressions. Again, the most emphasis should be put on the last regression (2.3) as it is corrected according to all specification tests.

Regression results model 2:

Shrinking frequency as the dependent variable

Fr	**Reg 2.1**	**Reg 2.2**	**Reg 2.3**
Agr	-0.406***	-0.281**	-0.360
	(0.000)	(0.019)	(0.239)
Gini	0.00490***	0.00457**	0.0131
	(0.009)	(0.033)	(0.123)
MEPV	0.0480	0.00473	0.0373
	(0.389)	(0.915)	(0.574)
Inf	0.00485***	0.00363***	0.00585**
	(0.000)	(0.008)	(0.011)
Mort	0.00189***	0.00138**	0.00234**
	(0.001)	(0.013)	(0.022)
Observations	595	595	595
R^2			0.246
Fixed effects	NO	NO	YES
Time fixed effects	NO	YES	YES

p-values in parentheses: $^{*}p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$

Similar to model 1, model 3 also tested social capability and GDP but took regional effects differences into account. Coefficients for the interactive variables should be interpreted as the differences in marginal effects from being a country located in Sub-Saharan Africa compared to the control group – East Asia & Pacific. From this model we were able to tell that agricultural employment had a significant effect on GDP in East Asia & Pacific, and that there was a significant regional difference in marginal effect according to regressions 3.1 and 3.3. An important finding is that the coefficients for this variable were *less* negative in Sub-Saharan Africa compared to the control group across all regressions. The interpretation of this is that a similar decrease in agricultural employment would have affected the GDP performance differently across the two regions and generate a larger positive effect on GDP in East Asia & Pacific. The same reasoning can be applied for the child mortality variable in regressions 3.4. The p-values for the gini variable were inconsistent and showed no trend of regional differences. The control and interaction variable for MEPV was significant only in regressions 3.4, whereas inflation was consistently insignificant. Similar to model 1, regressions 3.3-3.5 are of largest importance.

Regression results model 3:

GDP as the dependent variable, interactive SSA variables included

Log GDP	Reg 3.1	Reg 3.2	Reg 3.3	Reg 3.4	Reg 3.5
Agr	-2.673***	-2.020**	-4.246***		-2.447***
	(0.000)	(0.012)	(0.000)		(0.005)
Gini	0.0427**	-0.00143	0.0493***	0.00449	0.0302*
	(0.014)	(0.943)	(0.002)	(0.867)	(0.058)
MEPV	-0.0411	-0.00639	-0.0509	-0.132*	-0.0871
	(0.469)	(0.969)	(0.524)	(0.083)	(0.164)
Inf	0.00290	-0.000347	0.000442	-0.0000538	0.000952
	(0.256)	(0.927)	(0.889)	(0.612)	(0.720)
Log Mort	-0.384***	-0.835***		-0.872***	-0.557***
	(0.003)	(0.000)		(0.000)	(0.004)
Agr_SSA	2.465***	-0.960	4.085***		1.844
	(0.005)	(0.348)	(0.000)		(0.103)
Gini_SSA	-0.0299***	0.0183	-0.0215	0.0405	0.0190
	(0.001)	(0.309)	(0.479)	(0.233)	(0.472)
MEPV_SSA	0.0213	0.182	0.0812	0.178*	0.0977
	(0.755)	(0.591)	(0.372)	(0.062)	(0.195)
Inf_SSA	-0.00247	0.00484	-0.000403	0.000293	-0.000720
	(0.341)	(0.240)	(0.900)	(0.660)	(0.787)
Log Mort_SSA	-0.00754	0.0312		0.452***	0.214
	(0.965)	(0.892)		(0.000)	(0.269)
Observations	596	596	596	707	596
R^2			0.906	0.923	0.931
Fixed Effects	NO	NO	YES	YES	YES
Time Fixed Effects	NO	YES	YES	YES	YES

p-values in parentheses: $^{*}p<0.1$, $^{**}p<0.05$, $^{***}p<0.01$

Model 4 had shrinking year as the dependent variable, but unlike model 2 it took regional differences into account. Coefficients for the interactive variables should be interpreted as the regional difference in probability of having a shrinking year from a change in the explanatory variable. Agricultural employment was significant for the control group only in the random effects models, while the gini and inflation variables were significant across all regressions. Significant regional differences were detected for all variables apart from MEPV, but at different significance levels and of varying frequencies. However, focus should be on regression 4.2 as model 4 was the only model that was best specified with random effects.

Regression results model 4:

Shrinking frequency as dependent variable, interactive SSA variables included

Fr	**Reg 4.1**	**Reg 4.2**	**Reg 4.3**
Agr	-0.433***	-0.454***	-0.459
	(0.000)	(0.002)	(0.286)
Gini	0.0129***	0.0119***	0.0224*
	(0.000)	(0.007)	(0.078)
MEPV	0.0463	0.106**	0.0598
	(0.295)	(0.044)	(0.437)
Inf	0.0109***	0.0113***	0.0147***
	(0.000)	(0.008)	(0.000)
Mort	-0.000432	-0.00207**	0.000377
	(0.492)	(0.016)	(0.700)
Agr_SSA	0.271	0.463**	0.658
	(0.152)	(0.044)	(0.306)
Gini_SSA	-0.00700***	-0.00492***	-0.0470
	(0.000)	(0.034)	(0.239)
MEPV_SSA	0.0823	-0.0163	-0.0111
	(0.493)	(0.882)	(0.933)
Inf_SSA	-0.00693**	-0.00860*	-0.0103**
	(0.012)	(0.059)	(0.018)
Mort_SSA	0.00294***	0.00299***	0.00273**
	(0.000)	(0.000)	(0.033)
Observations	595	595	595
R^2			0.269
Fixed Effects	NO	NO	YES
Time Fixed Effects	NO	YES	YES

p-values in parentheses: $^{*}p< 0.1$, $^{**}p< 0.05$, $^{***}p< 0.01$

6.3 Discussion

In this section the results and its implications will be discussed. Firstly, the hypothetical scenario where the shrinking frequency and magnitude in Sub-Saharan Africa were replaced with the East Asian & Pacific shrinking properties, suggested that the largest improvement would be achieved by shrinking less often. If we accept the view that endogenous shocks are more detrimental to economic performance, it also implies that both cause and redemption could be found domestically in Sub-Saharan Africa. This is with the underlying assumption that the catch up process like that of East Asia & Pacific is the desired. In many ways this is

in line with the hypothesis; that possession of certain domestic characteristics can mitigate the effects of economic volatility. This is an important finding, not only does it confirm that a change of shrinking pattern can have positive results for the economic performance, it also means that domestic policies and structures affect the shrinking pattern to some degree and that countries hold power of the economic performance outcome.

As for the statistical models, agricultural employment and child mortality followed the expectations of being both statistically significant and having a negative slope coefficient in model 1, meaning that an increase in either would have a negative effect on GDP. However, figures 9-13 (see appendix) tracing regional development for each variable over time, along with model 3 revealed some important results regarding the regional differences. For example, the agricultural employment and child mortality were not only lower in absolute terms in East Asia & Pacific during the entirety of the time period (see appendix, figure 9), but model 3 showed that returns to improvements were larger in East Asia & Pacific compared to Sub-Saharan Africa.

To provide some explanation of the marginal effects difference for the agricultural employment variable, the agricultural sector must be compared to its alternative. The distinct negative relationship between GDP and agricultural employment (see appendix figure 7) implies that people who exit the agriculture sector are employed in higher value adding sectors. From the statistical model follows that these sectors must have been more contributory (value adding) to GDP in East Asia compared to Sub-Saharan Africa. This could for example be due to differences in political incentives to exit the agriculture sector and the policies in place to increase sector efficiency and promote other value adding activities. The remaining high agricultural employment levels in Sub-Saharan Africa also suggest that the incentives to switch sectors, and the returns of doing so, were smaller in this region.

We also found child mortality to be statistically significant for GDP and the marginal effect (in absolute terms) to be significantly larger for East Asia & Pacific. Another finding was the negative relationship plotted against GDP per capita (see appendix figure 8) confirming a trend of decreasing mortality with increasing GDP. However, there seems to be a threshold level around the 3.5-4 log GDP per capita over which the relationship is very strong. Above this level, countries seem to have had the means and capacity to properly combat the problem of child mortality. Under the threshold, a much larger spread in mortality rates were found for

the same GDP per capita levels, suggesting that only when reaching the low levels of child mortality the relationship with GDP per capita become prominent. Figure 13 shows that child mortality has consistently been lower in East Asia & Pacific compared to Sub-Saharan Africa, but both regions have experienced a substantial decrease over the last 60 years. Child mortality is a relatively good reflection of overall public health and is often argued to be strongly interrelated with education and income growth. Assuming that returns to these other societal functions would get amplified by any health intervention and that the relationship between GDP per capita and child mortality gets stronger at lower mortality levels, it is reasonable to believe that public health spendings have paid off better in terms of GDP per capita East Asia & Pacific. Mortality rates being constantly lower in East Asia & Pacific compared to Sub-Saharan Africa would place them closer to the threshold of having higher GDP per capita increases from child mortality decreases. It is also shown by the significant interaction coefficient in model 3 that was more negative for the East Asian & Pacific region.

The gini variable showed no stable significance to GDP and we were unable to detect any statistical regional difference. Figure 10 (see appendix) shows a persistent and stable gap in the gini estimate between Sub-Saharan Africa and East Asia & Pacific. Apart from a few exceptions, most countries experienced minimal changes over time making the variable relatively stationary. A surprising result from models 1 and 3 was the positive slope coefficient found for the gini variable as we would have expected an increase in the gini estimate to generate a decrease in GDP. One potential source of explanation is the Kuznets curve suggesting that economic inequality sometimes develops according to an inverted U-shape as GDP increases. This is because countries often lack the ability to redistribute increasing income in early stages of development. Most countries in our sample are assumed to be observed in early or ongoing stages of development so this could hold some understanding of this result. Considering that arguments can be found for both a gini increase and decrease as countries develop, we suggest looking into complementary or other indicators for inclusion.

Major episodes of political violence did in model 1 have a negative effect on GDP but without statistical significance. Not having a statistical significance does not necessarily mean that the variable is of no importance. Research gives strong arguments to why a country with social unrest and periods of violence would experience a declining economic development. It does however indicate that we were unable to capture this relationship

statistically with our chosen indicator and model. When looking at MEPV in model 3 we were surprised by the coefficient estimates. Although statistically insignificant, they implied that a year of conflict would have a positive effect on GDP in Sub-Saharan Africa. We are unsure of how to interpret this and wonder if MEPV was a good enough indicator for social stability.

The inflation rate showed significant only in the random effects regressions in model 1 and not at all in model 3. However, the biggest emphasis should be put on the fixed effects models as they satisfy more specification tests. Another possible influencer on the inflation results was the remarkably high rate measured in Indonesia of over a 1000%, immensely driving up the region mean (see appendix, figure 12). Although the arguments for inflation as indicator of state autonomy are well-founded, there might be ways to better capture the actual outcomes of inflation targeting. Alternative measures could for example be tax efficiency or taxes as total share of GDP. Due to too much missing data in these alternative indicators, we were unable to use them in this study.

Model 2 and 4 tested social capability performance and the propensity of having a shrinking year. We were unable to confirm consistency in coefficients and p-values across the regressions which gave us ambiguous results. Starting with regression 2.3; inflation and child mortality appear most significant, both showing a rise in the likelihood of shrinking from an increase in either. This is confirmed by regression 2.1 and 2.2, strengthening the results of the state autonomy and accountability's general importance for the shrinking outcome. Regression 4.2 showed that all variables have played a significant role in explaining the shrinking patterns in East Asia & Pacific. However, the regression did not provide any results of the variables' explanatory power for the shrinking in Sub-Saharan Africa, other than whether the effects were significantly different from East Asia & Pacific - which they mostly were. This was not confirmed by the reference regressions making the overall results from model 4 incoherent.

Unexpectedly, agricultural employment and child mortality had negative coefficients in regression 4.2 meaning that an increase in either would have decreased the risk of having a shrinking year in East Asia & Pacific. We found many independent sources reporting how a sectoral transformation away from agriculture strongly and well captures economic diversification and risk resistance. Considering the sharp decline in agricultural employment

in both regions (see appendix, figure 9) this result makes little sense. However, the result does not hold the opposite true – that a decrease in agricultural employment leads to increasing propensity of shrinking. Apart from the variables with negative slope coefficients, the likelihood of experiencing a shrinking year from an increase in any of the other variables was smaller in Sub-Saharan Africa. This does not imply that the propensity of shrinking was less determined by social capability in the Sub-Saharan African region, but that social capability most likely did not tell the entire story of what caused and prevented shrinking as we have witnessed a high proneness to shrinking in this region.

We conclude that the results from model 2 and 4 made us unable to fully answer the question of whether and how social capabilities affect the propensity of shrinking. We found throughout support of inflation being one determinant, and relatively high support for child mortality and the gini estimate to be generally important to shrinking. We also found most variables to have significantly different regional effects in regression 4.2. However, it is hard to tell from the models whether this social capability framework and its indicators have built resilience to economic shrinking, but neither have we found proof of the opposite. We are also unsure of the models' suitability as we were looking at the shrinking propensity from increases in variables, which actually is the opposite of what generally happens as countries develop. Thus, we would look into alternative ways to measure shrinking and avoid non-categorical variables for a more intuitive interpretation. One suggestion is through looking at the contribution of shrinking to economic performance over decennial periods and another to use a non-ranking and/or weighted index instead.

By looking at the value of R^2 for all models, we get an indication of the model's goodness-of-fit. That is, how well the variance of the dependent variable is described by the explanatory variables. For model 1 and 3, R^2 ranges from 80% - 90% indicating a high goodness-of-fit. However, uncorrected multicollinearity tends to increase R^2 – thus, we expect the actual fit to be lower. The R^2 given in models 2 and 4 is unreliable as the dependent variable was categorical and differently distributed than if the dependent variable would have been numerical. Although R^2 cannot provide us with any information regarding the goodness-of-fit for the model, statistical significance does not lose relevance and will still provide us with useful information of the effect a change in the explanatory variable has on the dependent variable (holding all other predictors constant).

All empirical studies also come with limitations. In our study, the presence of multicollinearity, missing observations and potential data collection difficulties in developing countries were sources of limitations. As we were unable to elimit them, they could have decreased the validity of our results.

7. Conclusions

The aim of this paper was to contribute to the recently addressed importance of shrinking resilience and social capability in the studies of economic development. Observing inconsistency and inability in convergence theory to explain income divergence across developing regions in the real world, opened for an opportunity to investigate the gaps. Accordingly, a hypothesis involving social capability and shrinking was formulated to investigate the case of East Asia & Pacific and Sub-Saharan Africa over the last 60 years. It seems that some developing countries have a larger problem creating resilience to shrinking than creating growth, which hinders them from exiting a non-developing state. It was shown that the Economic Performance in Sub-Saharan Africa could be ameliorated by mimicking the East Asian & Pacific shrinking pattern with emphasis on the frequency rather than magnitude. The frequency of shrinking is related to endogenous shocks, suggesting that countries hold some domestic power of affecting the economic outcome in terms of shrinking.

The social capabilities was summarized as a set of domestic characteristics that could be used to break down the difficult-to-define concept of institutional capacity and social arrangements into measurable categories. We found strong theoretical arguments linking transformation, inclusion, social stability, state autonomy and accountability to growth and shrinking. Through four variations of empirical models, we found partial support for the hypothesis - that these capabilities contribute to GDP through building resilience to shrinking. Transformation, accountability and inclusion had statistical support for being contributors to GDP performance. The role of social stability and state autonomy was theoretically well motivated but showed no statistical significance in explaining GDP. We concluded that there might exist stronger indicators if we would have chosen a more recent time span and we would suggest looking into using other indicators in further research. The models also

showed that the returns to improvement in each capability generally were larger in the East Asian region, which is a sign of institutional efficiency and social advancement. Thus, it can be concluded that the social capability differences across the East Asian & Pacific and Sub-Saharan African regions is a partial explanation of their divergent GDP development. This has much potential to be further used in the understanding of development and GDP.

We found strong theoretical support that each capability would have some degree of ability to diminish the effects of economic shocks. However, the models used for looking at social capability and the likelihood of shrinking had limited explanatory power and did not lead to any obvious conclusions. Although it was difficult to interpret the regional differences, state autonomy and accountability seemed to have been the generally most decisive factors for shrinking propensity. Uncertainty of the models' suitability and inconsistent coefficient and p-values raised the question of whether it should have been better respecified. We did find arguments in favor of our hypothesis in the summation of all capabilities and some statistically significant results suggesting that social capability reduced the shrinking propensity. It is important to note that social capability is a difficult concept to quantify that comes with uncertainties when translated into statistical models. However, we still believe that the social capability framework used is a good way to categorize social institutions as it is extensive and empirically sound. By altering some of the indicators to capture each capability more directly the framework could be improved.

We believe this field remains an interesting and important area for further research as economic shrinking clearly has growth and development effects. What could build resilience to shrinking is still mainly unknown and calls for exploration. It should however be stressed that economic shrinking is not a new phenomenon, just another, less noticed way to look at growth. We believe that the shrinking approach has potential to shift the development agenda through new directions of foreign aid for example. If GDP performance is the primary indicator of economic development, we believe a more self-sustained growth process could be achieved by targeting the reasons for shrinking rather than growth itself. Investing in growth creating activities has the risk of being an insatiable occupation as the results risk getting "eaten up" by a succeeding shrinking period. Thus, finding what creates a resilient economy has the potential of lifting countries out of underdevelopment and ameliorating the living conditions across the globe.

References

ABRAMOVITZ, M. (1995). The Elements of Social Capability. In Koo, B. & Perkins, D. (ed.). *Social Capability and Long-Term Economic Growth.* London: Palgrave Macmillan UK. pp. 19-47.

ACEMOGLU, D & ROBINSON, A. J. (2012). *Why Nations Fail: The Origins of Power, Prosperity, and Poverty*. New York: Crown Business.

ADELMAN, I & MORRIS, C. (1967). Society, Politics, & Economic Development: A quantitative approach. Baltimore: John Hopkins University Press.

ALESINA, A. & RODRIK, D. (1994). *Distributive politics and economic growth*. Quarterly Journal of Economics, 109(2), pp. 465-490.

ANDERSSON, M. (2018). *Resilience to Economic Shrinking, A Social Capability Approach to Processes of Catching Up in the Developing World 1951-2016*. Lund Papers in Economic History; No: 2018:183.

ANDERSSON, M. & PALACIO, A. (2017). *Catch up growth and social capability in developing countries: a conceptual and measurement proposal*. OASIS - Observatorio de Análisis de los Sistemas Internacionales. Issue 26, pp. 7-23. doi:10.18601/16577558.n26.02.

BROADBERRY, S. & WALLIS, J. (2017). *Growing, Shrinking, and Long Run Economic Performance: Historical Perspectives on Economic Development.* NBER Working Paper No. 23343.

BUITER, W. (2007) *Seigniorage*. National Bureau of Economic Research. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=cat02271a&AN=atoz.ebs14212095e&site=eds-live&scope=site (Accessed: 11 January 2021).

CARRUTHERS, B. (1994). When is that State Autonomous? Culture, Organization Theory, and the Political Sociology of the State. *Sociological Theory*, 12(1), pp. 19-44. doi: 10.2307/202033.

CARVALHO, A., RIBEIRO R. & MARQUES, R. (2018). Economic Development and Inflation: a theoretical and empirical analysis. *International Review of Applied Economics*, 32(4). https://doi.org/10.1080/02692171.2017.1351531.

CENTER FOR GLOBAL DEVELOPMENT. *Causes and consequences of high volatility in developing countries.* Available at: https://www.cgdev.org/sites/default/files/archive/doc/books/Beyond_Lending/01_Beyond_Lending-Ch1.pdf (Accessed 2021-01-11)

CENTER FOR SYSTEMIC PEACE. (2020). *INSCR Data Page.* Available at: http://www.systemicpeace.org/inscrdata.html (Accessed: 2021-01-19).

DEATON, A. (2013). *The Great Escape: Health, Wealth and the Origins of Inequality.* Princeton; Oxford: Princeton University Press

DE SOTO, H. (2003). *The mystery of capital : why capitalism triumphs in the West and fails everywhere else*. New York: BasicBooks. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=cat07147a&AN=lub.1509945&site=eds-live&scope=site (Accessed: 2021-01-11).

DIAMOND, P. & MIRRLEES, J. (1971). Optimal taxation and public production I: Production efficiency. *The American Economic Review,* 61(1), pp. 8-27. Available at: https://www.jstor.org/stable/1910538.

DOUGHERTY, C. (2016). *Introduction to Econometrics*. 5th edition. Oxford: Oxford University press

EROSA, A. & VENTURA, G. (2002). On inflation as a regressive consumption tax. *Journal of Monetary Economics*, 49(4), pp. 761–795. doi: 10.1016/S0304-3932(02)00115-0.

JOHNSON, N. & KOYAMA, M. (2017). States and economic growth: Capacity and constraints. *Explorations in Economic History*, 64, pp. 1–20. doi: 10.1016/j.eeh.2016.11.002.

JOHNSTON, B. F. & MELLOR, J. F. (1961). The role of agriculture in economic development. *The American Economic Review*, 51 (4), 566-593

KOREN, M. & TENREYRO, S. (2007). Volatility and development. *The quarterly journal of economics*, 122(1), pp. 243-287. Available at: https://search.ebscohost.com/login.aspx?direct=true&db=edsjsr&AN=edsjsr.25098842&site=eds-live&scope=site (Accessed: 2021-01-11).

LUCOTTE, Y. (2012). Adoption of inflation targeting and tax revenue performance in emerging market economies: An empirical investigation. *Economic Systems*, 36(4), pp. 609–628. doi: 10.1016/j.ecosys.2012.01.001.

MARQUES, A. & RIBEIRO, R., RONCAGLIA DE CARVALHO, A. (2018). Economic development and inflation: a theoretical and empirical analysis. *International Review of Applied Economics*, 32(4), doi:10.1080/02692171.2017.1351531.

OECD. (2021). Income inequality (indicator). doi: 10.1787/459aa7f1-en (Accessed: 2021-01-13).

OHKAWA, K. & ROSOVSKI, H. (1973). *Japanese Economic Growth: Trend Acceleration in the Twentieth Century*. Stanford: Stanford University Press.

PALACIO, A. (2018). *The Social Capability Index and Income Convergence.* Lund Papers in Economic History; No: 2018:184.

PRITCHETT, L. (2000). Understanding patterns of economic growth: Searching for hills among plateaus, mountains and plains. *World Bank Economic Review*, 14, pp. 221-250.

SEN, A. (1999). *Development as Freedom*. New York: Alfred Knopf; 1999.

SOLOW, R. (1956). A contribution to the theory of economic growth. *The quarterly journal of economics*, 70(1), pp. 65-94. Available at: https://www.jstor.org/stable/1884513?origin=JSTOR-pdf&seq=1#metadata_info_tab_contents

STIGLITZ, J. (1995). "Social Absorption Capability and Innovation.". In Koo, B. & Perkins, D. (ed.). *Social Capability and Long-Term Economic Growth.* London: Palgrave Macmillan UK. pp. 48-81.

STOLT, F. (2019). "The Standardized World Income Inequality Database, Version 8-9". Harvard Dataverse. V5. Available at: https://doi.org/10.7910/DVN/LM4OWF..

TIMMER, M. P., DE VRIES, G. J., & DE VRIES, K. (2015). "Patterns of Structural Change in Developing Countries." . In J. Weiss, & M. Tribe (Eds.). *Routledge Handbook of Industry and Development*. Routledge. pp. 65-83. Available at: https://www.rug.nl/ggdc/productivity/10-sector/ (Accessed: 2021-01-18)

TODARO, M. P. & SMITH, S. C. (2015) *Economic Development.* 12th edition. Harlow: Pearson education limited

WORLD BANK. (2021a). *GDP (Constant 2010 US$).* Available at: https://data.worldbank.org/indicator/NY.GDP.MKTP.KD (Accessed: 2021-01-18).

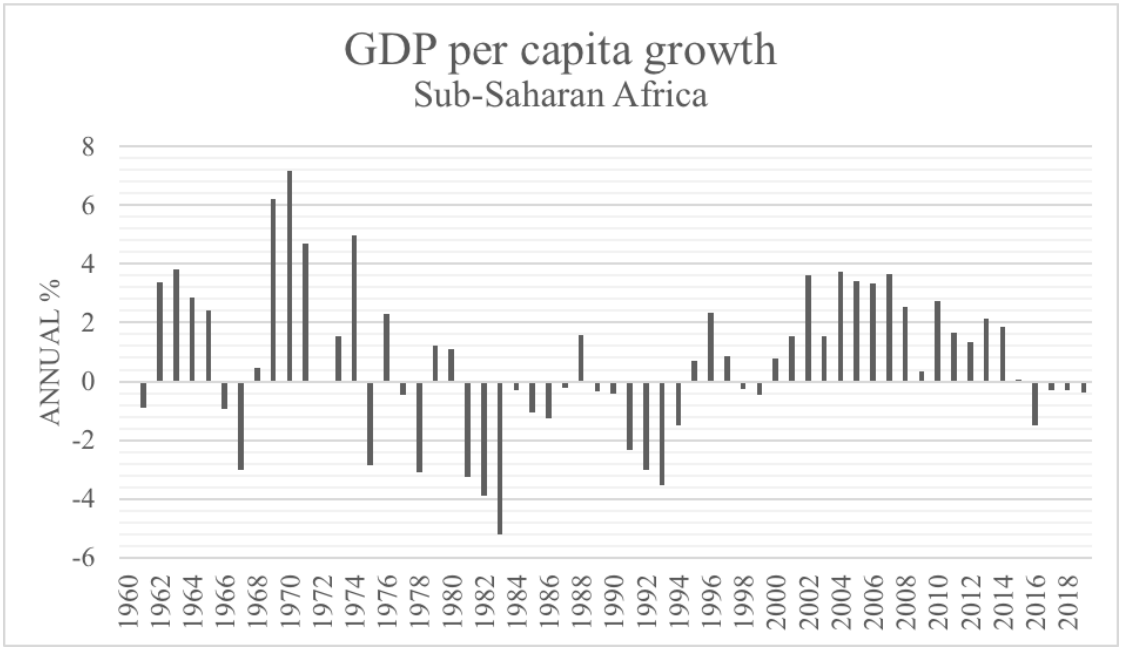
WORLD BANK. (2021b), *GDP growth (annual %). Available at:* https://data.worldbank.org/indicator/NY.GDP.MKTP.KD.ZG (Accessed: 2021-01-19)

WORLD BANK. (2021c). *Inflation, GDP deflator (annual%)*. Available at: https://data.worldbank.org/indicator/NY.GDP.DEFL.KD.ZG (Accessed: 2021-01-18).

WORLD BANK. (2021d). *Mortality rate, under 5-(per 1,000 live births).* Available at: https://data.worldbank.org/indicator/SH.DYN.MORT (Accessed: 2021-01-18).

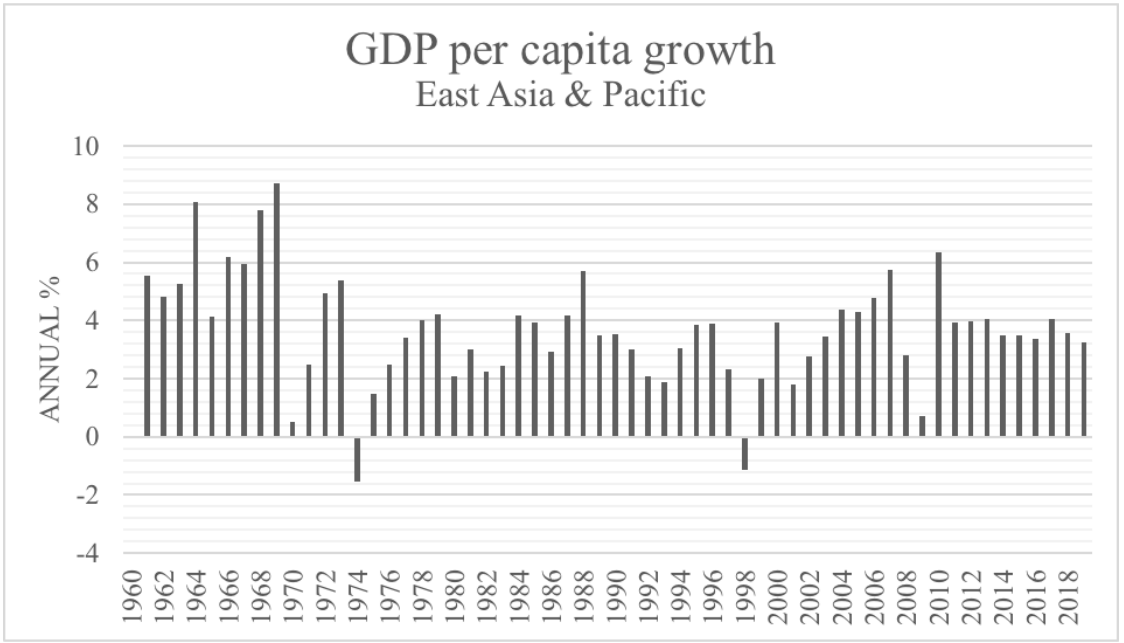
Appendix

Figure 5 & 6: Annual growth rates over the time period 1960-2019 for the aggregates of Sub-Saharan Africa and East Asia & Pacific (World Bank classifications). Number of shrinking years can be seen as the number of negative GDP per capita growth stacks.



(5)

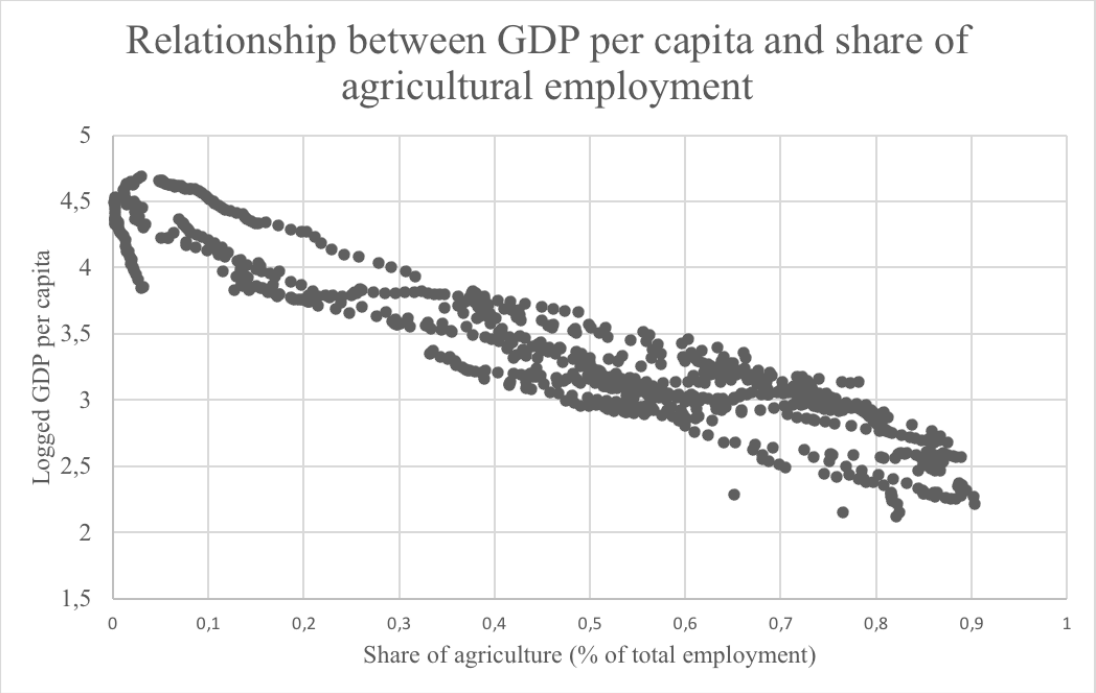
Source: Authors' own calculations based on World Bank data (World Bank, 2021a)



(6)

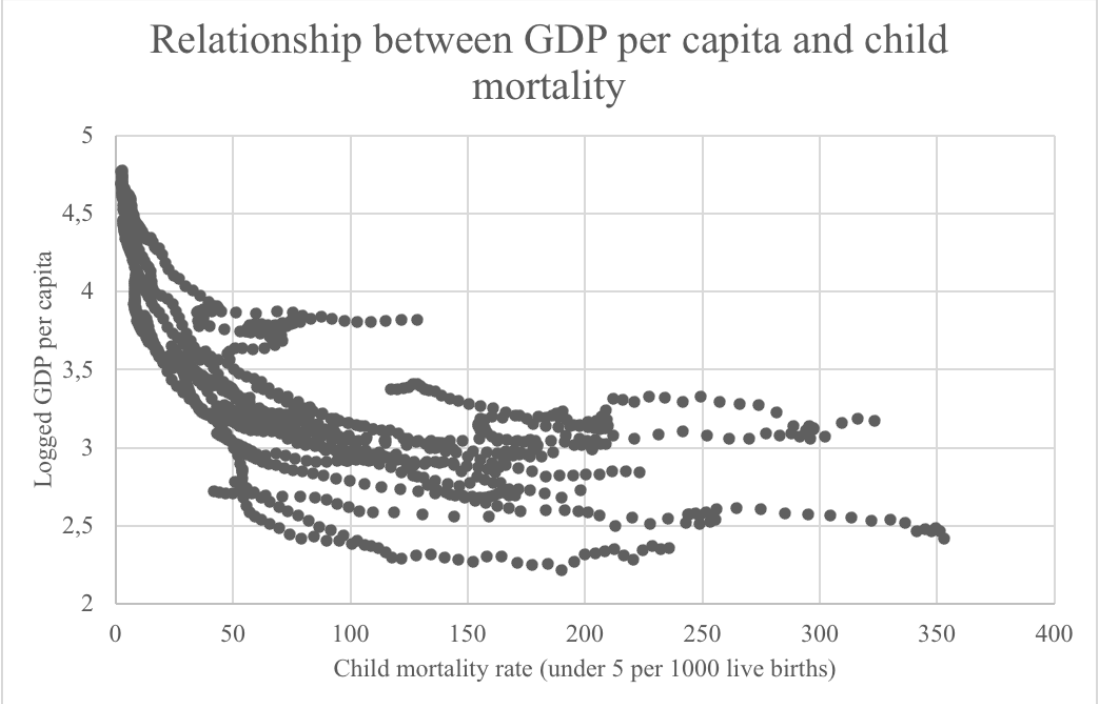
Source: Authors' own calculations based on World Bank data (World Bank 2021a)

Figure 7 & 8: Share of agricultural employment and child mortality rate plotted against GDP per capita for the sample over the years 1960-2019.



(7)

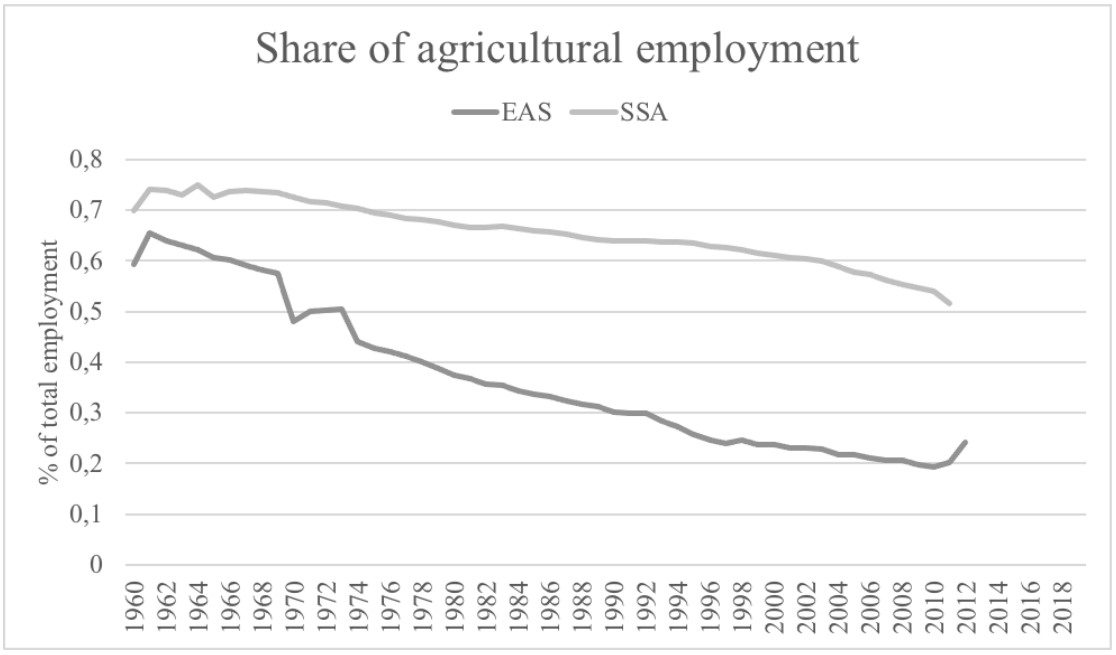
Source: Author's own calculations based on data from GGDC 10 sector database (Timmer et. al., 2015)



(8)

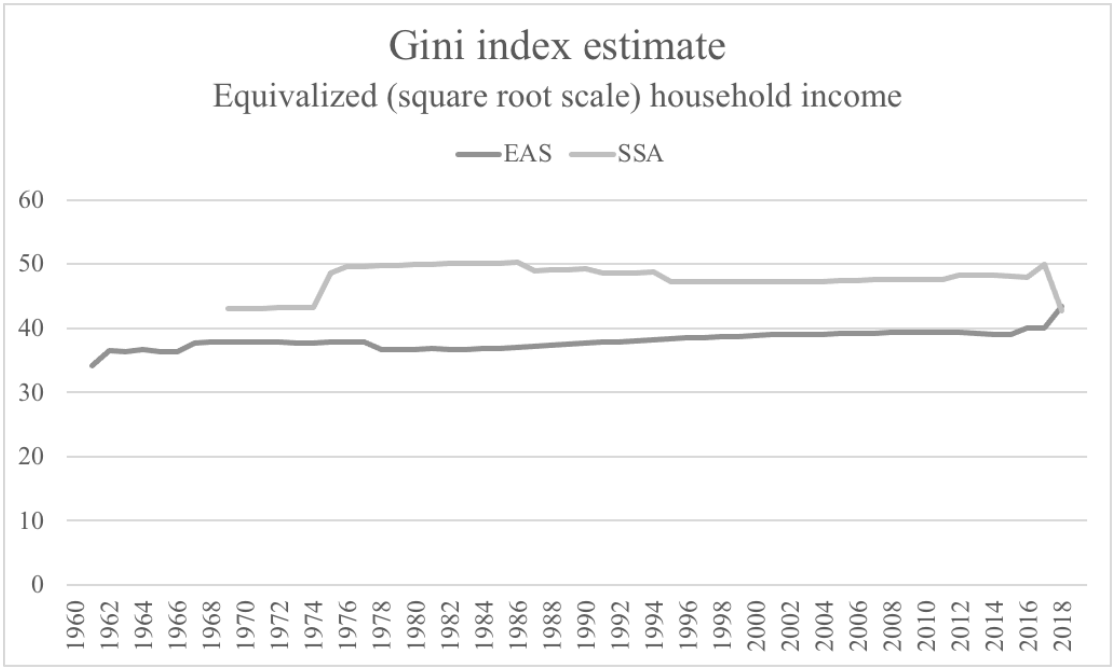
Source: Authors' own calculations based on data from the World Bank (2021a & 2021d)

Figure 9-13: The capability variables traced over the time period 1960-2019 for East Asia & Pacific and Sub-Saharan Africa.



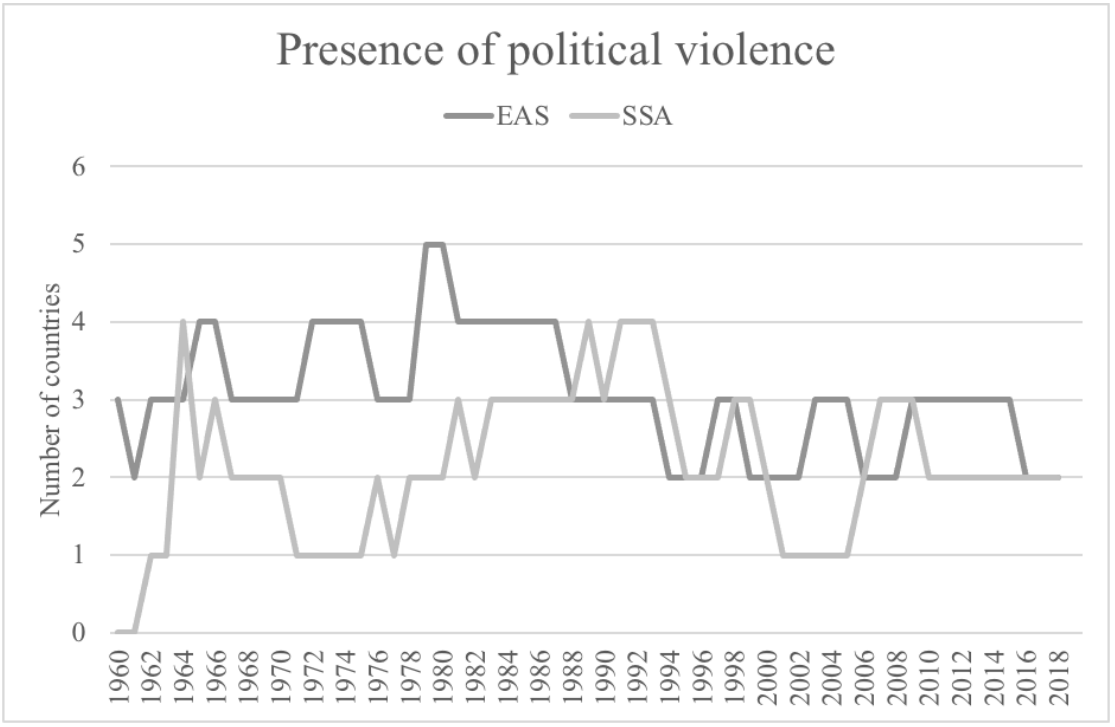
(9)

Source: Authors' own calculations based on data from GGDC 10 sector database (Timmer et. al., 2015)



(10)

Source: Authors' own calculations based on data from Standardized World Income Database (Stolt, 2019)



(11)

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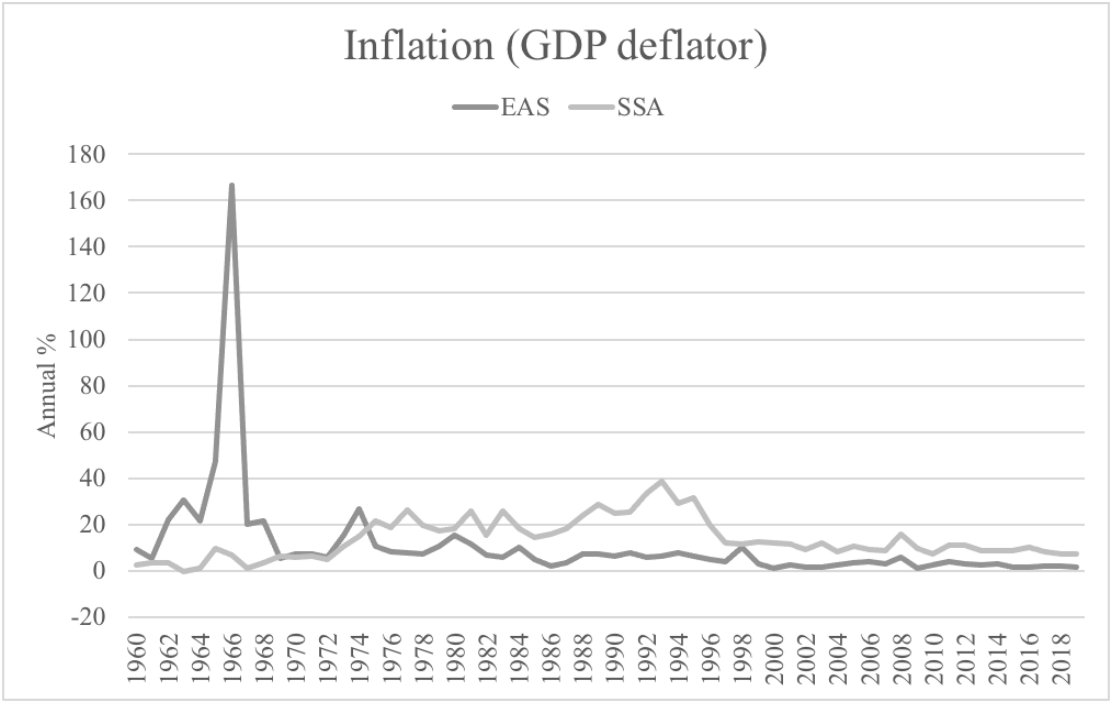
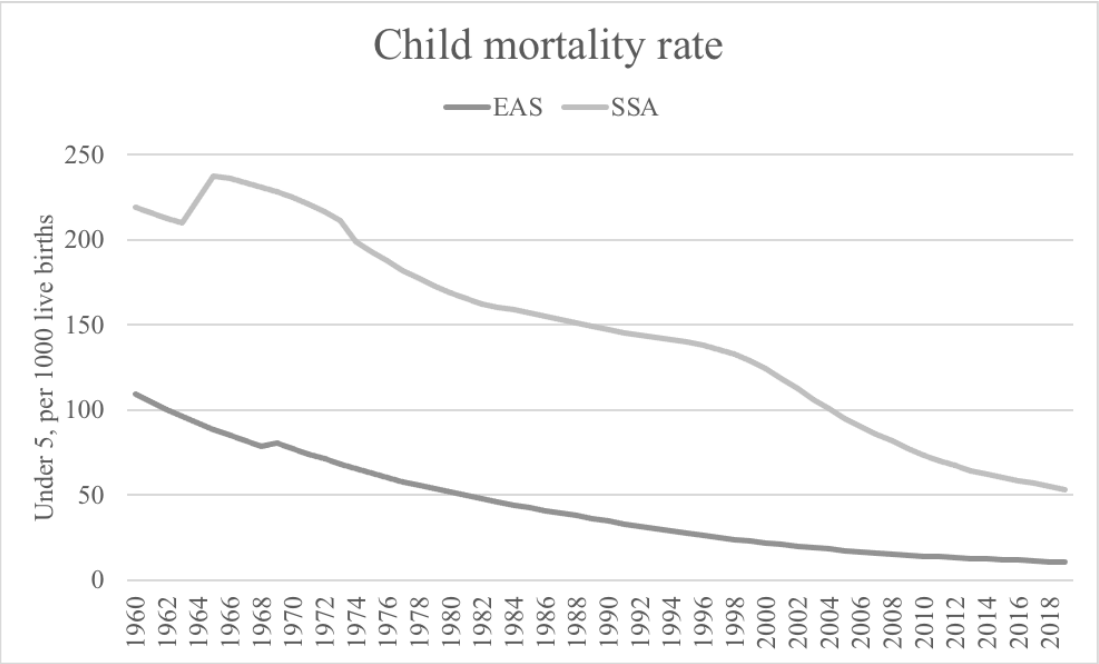


(12)

Source: Authors' own calculation based on World Bank data (World Bank, 2021c)



(13)

Source: Authors' own calculations based on World Bank data (World Bank, 2021d)

Tables 1-4: Matrix of correlations relevant for models 1-4

(1)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Log GDP	1.000					
(2) Agr	-0.937	1.000				
(3) Gini	-0.286	0.269	1.000			
(4) MEPV	-0.256	0.199	0.033	1.000		
(5) Inf	-0.327	0.356	0.226	0.008	1.000	
(6) Log Mort	-0.882	0.852	0.488	0.267	0.424	1.000

(2)

Variables	(1)	(2)	(3)	(4)	(5)	(6)
(1) Fr	1.000					
(2) Agr	0.076	1.000				
(3) Gini	0.187	0.270	1.000			
(4) MEPV	0.023	0.202	0.033	1.000		
(5) Inf	0.237	0.354	0.227	0.010	1.000	
(6) Mort	0.210	0.780	0.369	0.148	0.485	1.000

(3)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Log GDP	1.000										
(2) Agr	-0.937	1.000									
(3) Gini	-0.286	0.269	1.000								
(4) MEPV	-0.256	0.199	0.033	1.000							
(5) Inf	-0.327	0.356	0.226	0.008	1.000						
(6) Log Mort	-0.882	0.852	0.488	0.267	0.424	1.000					
(7) Agr_SSA	-0.664	0.708	0.383	-0.176	0.385	0.687	1.000				
(8) Gini_SSA	-0.427	0.430	0.718	-0.160	0.336	0.637	0.825	1.000			
(9) MEPV_SSA	-0.139	0.109	0.154	0.512	0.081	0.279	0.277	0.346	1.000		
(10) Inf_SSA	-0.326	0.368	0.326	-0.107	0.928	0.431	0.545	0.511	0.151	1.000	
(11) Log Mort_SSA	-0.558	0.561	0.564	-0.137	0.376	0.707	0.932	0.956	0.388	0.553	1.000

(4)

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)
(1) Fr	1.000										
(2) Agr	0.076	1.000									
(3) Gini	0.187	0.270	1.000								
(4) MEPV	0.023	0.202	0.033	1.000							
(5) Inf	0.237	0.354	0.227	0.010	1.000						
(6) Mort	0.210	0.780	0.369	0.148	0.485	1.000					
(7) Agr_SSA	0.202	0.707	0.385	-0.175	0.383	0.774	1.000				
(8) Gini_SSA	0.228	0.429	0.719	-0.159	0.335	0.625	0.825	1.000			
(9) MEPV_SSA	0.164	0.110	0.154	0.512	0.081	0.309	0.279	0.346	1.000		
(10) Inf_SSA	0.246	0.366	0.327	-0.105	0.928	0.537	0.543	0.510	0.152	1.000	
(11) Mort_SSA	0.258	0.618	0.409	-0.097	0.452	0.892	0.910	0.800	0.369	0.602	1.000

Table 5: list of sample countries from the Sub-Saharan African and East Asian region

Sub-Saharan Africa:	**East Asia & Pacific:**
Botswana	China
Ethiopia	Hong Kong
Ghana	Indonesia
Kenya	Japan
Malawi	Korea, Rep of.
Nigeria	Malaysia
Senegal	Philippines
South Africa	Singapore
Tanzania	Thailand
Zambia	