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## The Social Capability Index and Income Convergence

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# The Social Capability Index and Income Convergence

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## Abstract

Domestic social capabilities are a set of national characteristics for understanding why some countries grow faster than others. Yet there is no clear agreement on the main characteristics of these capabilities and therefore they have been neglected in the income convergence debate. The paper presents an index for revisiting the role of social capabilities in this debate. A relatively socially advanced society is more likely to improve the prospects of income convergence. The index is restricted to 4 capabilities: diversify the economy (transformation), distribute the benefits of growth (inclusion), control price inflation (autonomy) and provide public goods (accountability). Using a sample of 27 countries from Africa, Asia and Latin America over the period 1990-2010, we show that this set of capabilities is related to income growth and to long run performance in manufacturing. The index confirms the consolidation of the East Asian tigers and the rise of China, but the laggard performance on India. Indonesia represents the median in the index, surrounded by Latin American countries like Venezuela and Brazil. In the African context, we see Mauritius standing further away from Ethiopia, South Africa and Nigeria.

**Keywords:** catching up; income gap; social capabilities; ranking; developing countries

**JEL code:** O470

## 1. Introduction

There is no accepted definition of social capabilities, but everyone engaged in the income convergence debate have had thoughts or heard about them as a set of national characteristics, or factors, that are part of the explanation of why some countries grow faster than others. The concept was coined by Kazushi Ohkawa and Henry Rosovsky to capture the role of social and political institutions in the economic growth of Japan in the post war era (Ohkawa and Rosovsky, 1973). Later on, Abramovitz wrote, “no one knows the full scope of the subject or how to measure many of its elements ...it also leaves open the question whether a general rise over time in the social capability helps account for the unusual strength of convergence process after the first- quarter century following World War II...” (Abramovitz, 1986, Abramovitz, 1994). Potential metrics were years of education, managerial and technical experience, the quality and coverage of the financial system, the rule of law and its enforcement, among others. In the same line, several scholars contend that today’s industrialization demands social capabilities such as adapting foreign technologies to local conditions, acquiring skills, and coordinating complementary investments, among others (Rodrik, 2011).

In this paper we seek to measure the elements of social capability through a composite index that could revive the concept in the income convergence debate. Since the 2000s the developing world has been growing faster than the developed world, and the trend has persisted, even after the Great Recession of 2008 (UN, 2016). Our contribution lies in providing a standard and reliable empirical indicator that could be used across countries at different developmental stages and accommodates the key elements and does so in a persuasive manner. The attempts to quantify the relationships within the concept of social capability are many (Adelman and Morris, 1967, Temple and Johnson, 1998, Fagerberg and Srholec, 2017), and although well-grounded in theory and empirically robust, the results have deemed to be ambiguous because of the many dimensions involved and therefore difficult to intuitively understand their changes over time.

Following the Kuznets-inspired discussion by Abramovitz, which asserts that social capability basically consists of elements relating to (1) “people's basic social attitudes and political institutions” and (2) "the ability to exploit modern technology", and based on the analytical framework developed by Andersson and Palacio (2017), we pose four main questions that produce four inter-related, yet distinct, dimensions of these

capabilities (Andersson and Palacio, 2017). Thus the paper restricts itself to four broad processes of capability development in the context of developing countries, such as the ability to (i) diversify the economy out of agriculture (transformation), (ii) connect people to the growth process (inclusion), (iii) impose impersonal rules and laws to everyone (autonomy), and perhaps most importantly, to (iv) provide public goods representing the basic minimum rights of a citizen in any state (accountability).

We focus on 27 countries from Africa, Asia and Latin America, which represent over 40% of global GDP and 60% of its population. The data covers the period 1990 – 2010 and comes from various databases such as Groningen Growth Development Centre, the Standardized World Income Inequality, and the World Bank Development Indicators. We capture these key capabilities through macro-related variables or development indicators and summarize them by means of a simple and transparent ranking. Finally, we also make an attempt to relate the ranking to actual economic outcomes through OLS regressions and provide some evidence that income convergence and social capabilities go together.

We find a negative relationship between income growth and the capability index. The index explains 21% of the income variation, and indicates that, on average, a country moving a step down in the capability index see its income per capita fall by 0.68% per year. This implies that it is clearly more difficult to register consistently good economic performance when these capabilities such as surplus labour in agricultural employment (transformation), rising prices (state autonomy) and poor health (accountability), remain unresolved. On the other hand, we also find that inclusion measured by the combined measure of unemployment and net Gini (inclusion) has a strong positive relationship with growth. In other words, inequality comes with faster growth, either because the institutional response is too slow or because the institutions needed to accelerate growth are not the same needed to maintain growth.

We also find that social capabilities are related to long term manufacturing, a key sector for income convergence. The effect of social capability is positive in Asia, and negative in Africa and Latin America, suggesting that a more socially advanced Asia could withstand shocks against manufacturing growth better than other regions. Any worsening of the social capability would harm the performance of manufacturing, and therefore chances for income convergence, or catching up. The capability index shows that Korea, Malaysia, Argentina, Mexico and Mauritius are the top 5 countries while Nigeria, Malawi, Botswana, Kenya and Zambia the bottom 5. Indonesia represents the

median in the sample, followed by Perú and Brazil. We also confirmed the consolidation of the East Asian Tigers, and the meteoric rise of China, which jumped from rank 13 in 1990 to 8 in 2010. In contrast, India moved from 10 in 1990 to 18 in 2010. In the African context, we see Mauritius standing alone in the top 5 while South Africa and Nigeria are the bottom of the ranking.

## 2. Defining capabilities

Some argue that capabilities are attributes of the individuals, not collectives (firms, organizations or countries). Thus, individual capabilities have been associated with the opportunities, or substantive freedom, people have access to, which may be limited by the lack of personal resources or the context in which people operate (Sen, 1993). Thus, the individual inequalities in outcomes that we see every day are associated with differences in substantive freedom, or the ability to do or be in their lives, and therefore the presence or lack of these capabilities may explain why inequalities arise.

A similar logic may apply to collectives, in particular countries. Countries aggregate individual capabilities and resources, and therefore the social good, or positive externalities arising from their interaction, are more than the sum of individual units for our understanding of why modern growth happens and persists. Here we seek to document a set of national characteristics in developing countries that we can label as “social capabilities” and attempt to relate them to actual economic outcomes. Adelman and Morrison (1967) pioneered the effort of defining social capabilities as “the processes of changes in attitudes and institutions associated with the breakdown of traditional social organization” and quantifying them through factor analysis. They summarized the many relationships among 41 social, economic and political variables, such as urbanization, educational attainment, mass communications, fertility rate, competitiveness of political parties, rate of growth, technological adoption and social mobility, among others. The main critique to the Adelman and Morrison Index is that, although well-grounded in theory and multidimensional, it was not easy to trace changes over time given the number of variables involved.

Abramovitz (1986) asserts that social capability basically consists of elements relating to (1) “people's basic social attitudes and political institutions” and (2) “the ability to exploit modern technology”. Potential metrics are usually related to skills and returns



to education, years of managerial and technical experience, the share of credit to the private sector, the enforcement of property rights, the right to vote, and social capital, among others. Inspired by these ideas, many studies have used factor analysis to turn some of these indicators into measures of capabilities, usually technological capability, governance, political system and openness (Fagerberg and Srholec, 2008). However, the main critique remains, namely that these measures summarize a set of variables into one, and therefore difficult to trace changes over time unless the statistical exercise is run regularly and open to detailed scrutiny. Furthermore, the strand of literature dealing with innovation systems uses the term handsomely, but the distinction between social and technological capabilities, with the latter based on indicators that are in short supply in most developing countries, such as scientific publications, patents, investment in Research and Development, and so forth, may be of little importance for developing countries.

We built upon a conceptual framework that poses four main questions to capture four inter-related, yet distinct, dimensions of these capabilities: transformation, inclusion, autonomy, and accountability (Andersson and Palacio, 2017). The four capabilities are not seen as outcomes, but processes, and are aimed to reflect the deeper forces at play for countries' ability to accelerate and maintain economic growth. For each of these capabilities we also suggest some headline indicators and present some other indicators under each heading (see table 1).

### ***2.1 Capability to transform the Economy from Agrarian to Industrial Growth***

Historically, the growth path is marked by a process of structural transformation. By structural transformation we mean changes in output and employment composition as an economy develops (Kuznets, 1973). Generally speaking, productivity growth in agriculture reallocates labour and capital into the industrial and service sector. In other words, productivity growth in agriculture has a direct effect on the demand for manufacturing goods and services and therefore on increases in income per capita.

This capability can be partially revealed through the inverse relationship between income per capita and the share of agricultural employment. The greater the income per capita the lower the share of agricultural employment. Figure 1 shows this relationship for 27 countries for the period 1990-2010. The reallocation of labour and capital depends on the type of crops and the stock of technologies in use. By technology we mean the elasticity of agricultural output with respect to labour, which varies between temperate

and tropical climates from 0.1 to 0.4 (Eberhardt and Vollrath, 2016). In general, choices of labour and land saving technologies are closely linked to its sectoral output pattern and firm size structure, i.e. subsistence farming is replaced by modern farming, yet some excess of labour remains in developing contexts (Gollin et al., 2013). Hence open economies with a comparative advantage in agriculture might be able to release labour out of agriculture at different rates. Its ability to grow may lie initially in agriculture, but in the long run a shrinking sector in terms of relative GDP contribution may not be enough to sustain growth. A country able to reallocate its resources from agriculture into other sectors would have a better chance to catch up with the rich world.

## ***2.2 Capability to Include in the Non-Rich Population into the Growth Process***

The reallocation of labour across sectors is an important source of growth for developing countries. Yet releasing labour out of agriculture does not necessarily lead to employment in industry and services of higher value added (McMillan et al., 2014). Connecting the losers of the transformation into the growth process determines whether it has been inclusive or not. In the absence of strong social protection networks or non-competitive financial markets, labour market outcomes are the only determinants of economic welfare for most families.

In general, the capability to include people into the growth process can be revealed through the evolution of the income distribution, in particular whether the income growth of the bottom grew faster than those on the top (Ravallion, 2004). The labour share as a proportion of GDP is another indicator of the worsening or improvement of the income distribution. In the absence of complete time series of poverty outcomes for the period, we combine unemployment and the net Gini coefficient as a summary measure. The lower the result, the greater the equality. Figure 2 shows the relationship between income per capita and our combined measure of inequality.

Latecomers have therefore to find ways to include people in if the aim is to not to leave unused resources in the economy and raise the expectation of higher income for everyone. For instance, the rise of women in the labour force participation is a sign of improvement (Elborgh-Woytek et al., 2013). However, we acknowledge that developing countries tend to have a large underground economy, and the measures used here to capture inclusion may not be able to capture the experiences of those outside the realms of the state.

### ***2.3 Capability to Develop an Autonomous State***

State autonomy is as an important capability, not least because it is usually seen as the ability to collect taxes, but to keep vested interests at bay through law enforcement and order (Johnson and Koyama, 2017). However, it is difficult to see a state develop without the influence of a vibrant network of non-state stakeholders, ranging from aristocrats, entrepreneurs, politicians, journalists, trade unions and other social organizations, let alone the large underground economies so common in developing countries. In other words, a strong state and a weak civil society might not fit the social and institutional requisites for sustainable growth. Furthermore, modern states and market economies complement each other because the latter cannot work in an institutional vacuum.

This capability can therefore be revealed in the monetary area of poor and rich countries. Inflation is relatively higher and volatile in poor countries, and seigniorage accounts for a significant part of government revenues in those countries (Lucotte, 2012). Although the evidence is mixed, the literature indicates that high inflation has a negative effect on long term growth, and can be considered as a regressive tax for those in the bottom of the income distribution (Erosa and Ventura, 2002). Since the 1990s, many developing countries have adopted a clear target for inflation rate as a response to the loss of inflation tax revenue (Lucotte, 2012). The process of implementing inflation targeting is a gradual process of economic and institutional reforms, which allows central banks to deal with difficulties in conducting their monetary policy, such as exchange rate pegs, for instance. Furthermore, a generally accepted bureaucracy of technocrats designs and executes the policy, while other branches of political power are not expected to dictate policy. Figure 3 shows an ambiguous relationship between growth and inflation for the period 1990-2010.

Latecomers that are able to control inflation are more likely to grow in the long run, and their states will be able to improve the performance of its tax administration. Foreign trade policy is somehow a similar case. Policy instruments are available if the country wants to limit or in other ways affect the level of exports and imports. Both here and in the monetary area, some countries do better than others, and capturing these differences provides clues on the state of autonomy.

### ***2.4 Capability to provide Accountability in the Provision of (mixed) Public Goods***

An autonomous state is a necessary condition, but insufficient to be able to deal with arbitrary governance, abuses, waste and persistent inequality. Hence one should therefore

measure institutional quality through accountability, i.e. the quality of governance and provision of public goods (Besley and Persson, 2013). In other words, the patterns of recurrent spending on one sector rather than others provide light on the most productive sectors or those ensuring an expected higher social return such as health, education, infrastructure, among others. Not surprisingly, we expect to see accountability to be pro-cyclical social spending, regardless of the type of political organization. If the country does not follow the swings in the economy activity, and commits its budget to honour the social contract, there are better chances to catch up in the long run. Even though the level of public debate is often insufficient, voting out governments, or parties, that do not deliver their promises, also influence the pro-cyclical nature of social spending. Thus, late-comers with increasing or higher levels of social expenditure than industrialized countries when they had similar levels of development may be more likely to catch up, and plausibly more politically stable.

To provide accountability, the process of providing public goods is central, but so are the outcomes. Thus, this capability can be captured through real outcomes in population health, educational attainment or infrastructure. For instance, income per capita has a strong relationship with population health, measured by life expectancy at birth, but the relationship levels off beyond after a threshold close to 8000 dollars of GDP per capita (Daniels, 2008). The levelling is apparent among industrial economies, but a closer inspection reveals that the life expectancy of Costa Rica is similar to that of the United States. This implies that the health – income relationship is mediated by other factors such as culture, social organization and government policies, among others. In the same line, a country that invests little in education and infrastructure or invest less in its younger generations while favouring the seniors and the already well-to-do might be an example of low levels of accountability. In the 1990s, when public education was the major recipient of social spending, Latin America committed less to mass education than in in East Asia, East Europe, or the Middle East at similar levels of average income (Abad and Lindert, 2017).

### **3. Capabilities Ranking**

A simple way of summarizing this type of information is to rank countries according to how they are positioned relative to others on the processes discussed in this paper. For each capability, we aim to provide a summary indicator as simple and transparent as possible. We use data from the Groningen Growth and Development Centre 10-sector

database for the share of agricultural employment, the net Gini from the Standardized World Income Inequality database, and the unemployment, inflation and child mortality figures from the ILO, the IMF and the World Development Indicators website.

We acknowledge that the trade-offs involved are many, such as the availability of high quality data and the sample size. Furthermore, mechanical indices do not reflect the complexities and changing dynamics involved in the interaction between these variables. Additionally, there are also limitations arising from the inputs into the calculations being far from exhaustive in their description of developing countries. However, we hope to provide a full picture of the key capabilities that set developing countries apart from others in other regions using a sample of 27 countries distributed in Africa, Asia and Latin America.

#### ***A. Ranking countries by capabilities***

We use each variable discussed in the paper and calculate how every country ranks relative to all others. For example, if we rank the sample of 27 countries according to the labour share in agriculture, we consider the largest share as being the less diversified economy and most vulnerable to shocks of any sort. The country with the smallest labour share in 2010, Argentina, is given an index ranking of 1 and the country with the largest, Tanzania, is given an index ranking of 27. Larger numbers indicate lower relative capability on the indicator in question and therefore in the process. Similarly, countries with the high ranking in income inequality might be less prone to growth, as would be the countries that have high and persistent inflation rates relative to others in other regions. These countries are relatively unequal and therefore exposed to adverse macroeconomic shocks that cannot be easily absorbed without assistance from the international community. Similarly, countries with the lowest level of accountability, and high ranking, are probably less able to provide public goods and services to their citizens and could be disadvantaged.

We also capture capability by combining the measures above into an index. An aggregate summary ranking is achieved by calculating the equally weighted average across the four individual indicator rankings used in this simple study. The result is a broad reflection of which level of capabilities the countries in the sample. Table 2 provides the details of the calculations and ranking.

According to the estimates for year 2010, Zambia is the most vulnerable economy in the sample. It has one of the largest share of its population working in agriculture

(65%), highly unequal (51 Gini points), high inflation and little efficiency in the delivery of health measured by its large child mortality (83 per 1000). These are all factors that indicate the low level of capabilities and therefore the low ranking in terms of the index. At the other extreme we have Malaysia. In the East Asian context, it has a relatively low population in agriculture (14%), relative low inequality (40 Gini points) and one-digit inflation (1.7%), and child mortality (8 per 1000). This outcome is not intended to imply that Malaysia, or other countries in the sample, do not lack or face other vulnerabilities. It is simply a reflection of how these economies compare based on just the four indicators chosen to illustrate the relative position at the global scale. Looking at figure 4, the index appears to confirm the recent performance of the East Asian economies.

### ***B. Capabilities and Income Convergence***

We fit a series of simple linear regressions in order to understand the relationship between the potential capability indicators and real economic outcomes. The logarithm of GDP per capita is our dependent variable. The data comes from GDP per capita measured in <sup>US</sup>US dollar PPP terms of year 2011. The data are annual and therefore only 20 observations are available for most countries. In the appendix, table 5 shows income per capita by country relative to income per capita in Korea. We also note the high likelihood of cross-correlation between growth outcomes during the latest commodity boom and the 2008 financial crisis, given that it represents a common shock to all countries in the sample, albeit with different intensities.

To investigate the usefulness of ranking countries by their degree of capability, we fit separate regressions using each of the four vulnerability indicators shown in Table 3 (share of agricultural labour, unemployment and net Gini, inflation, child mortality). Since these economies are ranked according to their relative degree of capability in each of these indicators, our aim is to find a negative relationship between the relative degree of capability and the average growth rate it is able to achieve. For example, we would expect that a high ranking on share of agricultural labour – which by construction indicates that the agricultural productivity is relatively low– would result in lower growth outcomes than for economies that have a higher agricultural productivity.

A closer look at the regressions (Table 3) indicates that the slope coefficients for the labour share in agriculture (transformation), inflation (autonomy) and child mortality (population health) are consistent with the expected negative relationship between

relative capability and growth. For instance, an increase of unit in the ranking leads to 0.18% lower growth in income per capita. However, an interesting exception is the combined measure of unemployment and net Gini, which indicates a strong positive relationship with growth. A possible explanation for why a rise in the coefficient might be associated with faster growth could relate to the fact that the acceleration of growth in these countries typically do not have the institutional setting to redistribute growth efficiently. More realistically, the institutions needed to accelerate growth may not be the same needed to maintain growth (Rodrik, 2000).

Another finding is that the less statistically significant (P-value) explanatory variables for growth is the state's autonomy measured by inflation. The outliers were smoothed out by the ranking, but the R squared indicates that it explains less than 3% of the variation in growth outcomes. The alternative, total taxes as a share of GDP, should provide more satisfactory results, but missing data for some countries affect the estimates.

The combination of all indicators into the summary index yields a relatively good fit: 21%. In part, this is because more variation and information is reflected by the index to explain the dependent variable, but we would also argue that it is clearly more difficult to register consistently good economic performance when armed with undeveloped capabilities and exposed to a significantly larger number of sources for adverse shocks. This relationship is plotted in Figure 5.

### ***C. Capabilities and Manufacturing***

A look at history indicates that industrialization has been the best remedy against poverty. In the last decades, however, there has been a trend toward premature deindustrialization in the developing world, with the exception of some East Asian countries (Rodrik, 2017). To catch up with the developed world, Abramovitz (1986) argues that socially advanced societies in developing economies have a better chance to exploit modern technology. Hence, as these economies grow richer, the difference in the manufacturing to output ratio relative to that in advanced economies should decrease.

Theory suggests that the manufacturing to output ratio follows an inverted U-curve, with increases at early stages of development, then peaks and decreases as real income per capita reaches relatively higher levels (Herrendorf et al., 2014). A partial explanation is the loss of its cost advantage to less developed economies, especially in more labour-intensive industries.

We run a panel regression to examine the relationship between the manufacturing to output ratio relative to Korea, one of the champions of growth and social capability over the last 50 years, with real per capita income levels and the relative ranking of capabilities. The dependant variable is the ratio of the share of manufacturing in output in country  $i$  to that of Korea for the period 1990-2010. We use constant value added in 2005 PPP US dollars from the Groningen Growth and Development Centre dataset. The independent variables are the ratio of real income per capita and its square, and the average level of capabilities based on the individual rankings.

Table 4 shows that developing economies still have room to grow vis a vis Korea in the coming years. The ratio of income per capita is two times the size of that of its square. However, the effect of social capability is less robust. It is positive in Asia, suggesting that it could withstand any shocks and therefore contribute to manufacturing growth and therefore income convergence. It is however negative in Latin America and Africa, and not statistically significant. Any worsening of the social capability would harm the performance of manufacturing, and therefore chances for income convergence, or catching up.

#### 4. Conclusions

The aim of this paper is to provide a simple summary measure of the capabilities available in a country for the period 1990-2010. The index is based on historical processes through which successful economies had to go through in order to industrialize and eliminate poverty. Apart from being empirically sound, it has four dimensions that follow a convergence path that is familiar to almost everyone, meaning stakeholders, researchers, policymakers and civic groups.

We start with the reallocation of agricultural labour out into other economic sectors, which is associated with the expansion of the labour market and its connection of the rest of the economy. The emergence of employment opportunities in new activities is not always available to all, and therefore we capture its evolution over the period 1990-2010. The period appears to be of overall improvements, but the ranking of capabilities put countries relative to others and indicates that doing well is necessary, but not a sufficient condition for income growth. Then we examine the ability to control inflation, which is an impersonal tax on everyone, with a larger negative effect for those in the bottom. An economy that is able to commit, coordinate and monitor the evolution of the level of inflation has a better chance to be resilient to macroeconomic shocks in the



globalized world of today. Finally, the improvement in infant mortality contributes to increases in life expectancy and therefore in human capital. Even though the improvement has occurred almost everywhere, high levels remain in some countries.

We find an association between these capabilities and growth. The estimates by region indicate that the index of social capability in the Asian countries have a positive impact on manufacturing productivity relative to Korea. It has however a negative impact on Latin America and Africa, suggesting that any worsening would harm growth in the long run. We believe that an index based on the four capabilities is conceptually easy to understand and useful for those interested in adding another ingredient to their toolbox of explanations of why some countries grow faster than others.

## Appendix

***Table 1. A conceptual framework of social capability: questions and potential indicators***

Measure of	Addresses questions like	Potential Indicators
Transformation	How diversified is the economy?	Share of agricultural employment Agricultural labour productivity Export sophistication
Inclusion	How do people fare as growth happens?	Poverty head count ratio Unemployment Net Gini
State autonomy	How modern is the state?	Inflation targeting Total taxes as % of GDP Openness
Accountability	How effective and transparent is the social spending?	Health or Educational outcomes Infrastructure (roads in kms)

**Table 2. A conceptual framework of social capability: questions and potential indicators**

	Transformation	Inclusion	State autonomy	Accountability	Capability Index
Countries	Agr Employment	Unemployment + Net Gini	Inflation	Child mortality	Index
Korea	3	2	8	1	1
Malaysia	8	5	4	2	2
Argentina	1	12	24	5	3
Mexico	7	17	13	10	4
Mauritius	4	4	7	7	5
Costa Rica	9	18	17	4	6
Thailand	18	7	9	6	7
China	17	19	10	8	8
Chile	6	22	2	3	9
Colombia	10	24	5	11	10
Philippines	16	16	11	14	11
Venezuela	5	11	27	9	12
Indonesia	19	15	16	15	13
Peru	12	14	3	13	14
Brazil	11	23	15	12	15
Ethiopia	25	1	21	24	16
Ghana	21	3	23	23	17
India	20	20	25	19	18
Bolivia	15	13	6	16	19
Senegal	22	8	1	21	20
South Africa	2	27	14	18	21
Tanzania	27	9	18	22	22
Nigeria	14	10	26	27	23
Malawi	26	6	20	26	24
Botswana	13	26	19	17	25
Kenya	23	21	12	20	26
Zambia	24	25	22	25	27

**Table 3. The relationship between Capabilities and Growth**

Ranking according to the indicator	Slope coefficient	P-value>t	R <sup>2</sup>
Labor share in agriculture	-0.18	0.10	60%
Unemployment + net Gini	1.10	0.00	7%
Inflation	-0.09	0.53	3%
Child mortality	-3.11	0.001	71%
Capability Index	-0.68	0.08	21%

Note. Log-level regression using a panel sample of 27 countries and 567 observations for the period 1990-2010. The slope coefficient is already multiplied by 100. The sample includes Argentina, Bolivia, Botswana, Brazil, Chile, China, Colombia, Costa Rica, Ethiopia, Ghana, India, Indonesia, Kenya, Korea, Malawi, Malaysia, Mauritius, Mexico, Nigeria, Peru, Phillipines, Senegal, South Africa, Tanzania, Thailand, Venezuela and Zambia. \*\*\*p<0.01 \*\*p<0.05 \*p<0.1

**Table 4. Panel regression estimates for Long-Term Manufacturing**

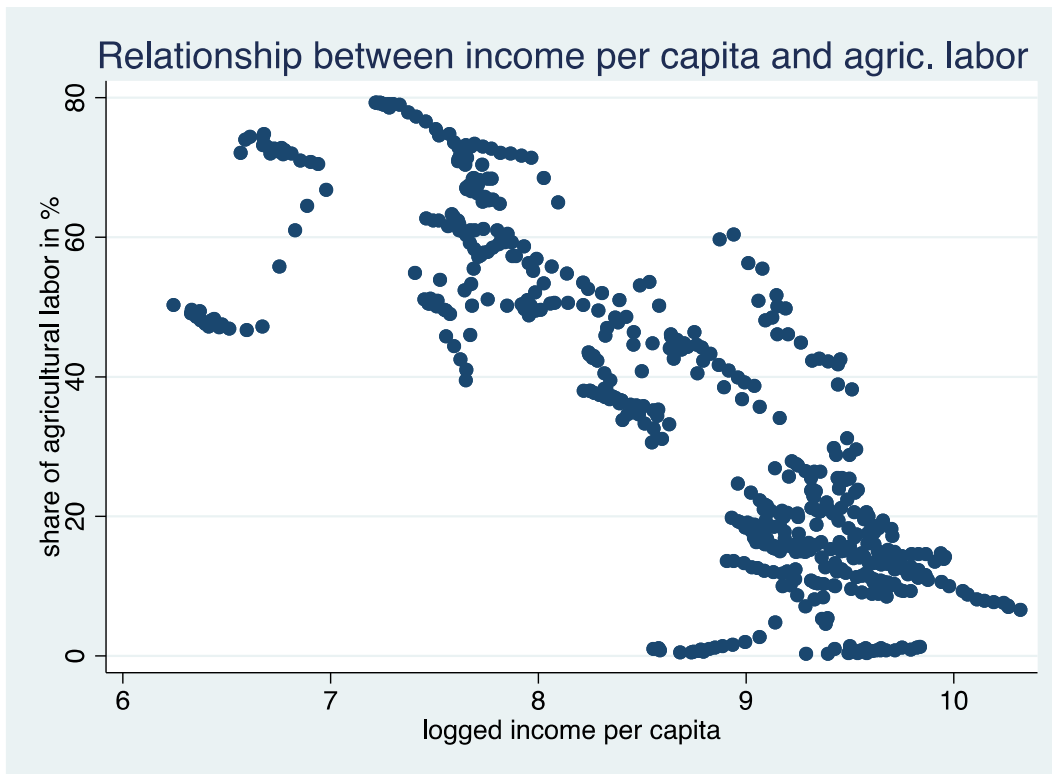
Variables	Full sample	Asia	Latin America	Africa
Constant	yes	yes	yes	yes
Real per capita income	1.95***	1.71***	1.80***	2.89***
Real per capita income (squared)	-0.79***	-0.90**	-0.69***	-1.68***
Social Capability	0.004*	0.017***	-0.002	-0.0001
R-squared	24%	3%	43%	25%
Observations	567	147	189	231
Countries	27	7	9	11

Note. The sample includes Argentina, Bolivia, Botswana, Brazil, Chile, China, Colombia, Costa Rica, Ethiopia, Ghana, India, Indonesia, Kenya, Malawi, Malaysia, Mauritius, Mexico, Nigeria, Peru, Phillipines, Senegal, South Africa, Tanzania, Thailand, Venezuela and Zambia. Korea is the base for estimating the ratios. \*\*\*p<0.01 \*\*p<0.05 \*p<0.1

*Table 5. Relative income per capita, using Korea as the base.*

country	1990	part% 1990	part% 2000	part% 2010	var 00/10	var 90/10
Malawi	744,19708	6%	4%	3%	1,8%	1,7%
Ethiopia	651,95309	6%	3%	4%	5,7%	2,5%
Tanzania	1472,5837	13%	7%	7%	3,5%	1,8%
Senegal	1844,868	16%	9%	7%	1,3%	0,8%
Kenya	2380,4098	20%	10%	8%	1,5%	0,2%
Ghana	1919,5966	17%	11%	10%	3,1%	2,4%
Zambia	2341,9331	20%	10%	11%	4,5%	1,7%
India	1754,8573	15%	12%	15%	5,8%	4,7%
Nigeria	3041,5094	26%	14%	17%	6,1%	2,7%
Bolivia	3707,2451	32%	21%	18%	2,1%	1,9%
Philippines	4010,2028	34%	20%	18%	2,9%	1,7%
Indonesia	4625,3773	40%	28%	28%	3,8%	3,0%
China	1526,4087	13%	18%	31%	9,9%	9,6%
Peru	5312,6847	46%	32%	33%	4,3%	3,2%
Colombia	7533,5184	65%	40%	36%	2,8%	1,9%
South Africa	9696,3811	83%	46%	39%	2,2%	1,0%
Costa Rica	7787,1618	67%	48%	43%	2,8%	2,6%
Botswana	8110,4405	70%	50%	44%	2,5%	2,5%
Thailand	6650,4397	57%	44%	44%	3,9%	3,6%
Brazil	10344,637	89%	55%	48%	2,5%	1,7%
Mexico	12584,468	108%	72%	51%	0,3%	1,1%
Mauritius	7386,8244	64%	53%	53%	3,7%	3,9%
Venezuela	14450,684	124%	69%	55%	1,4%	0,7%
Argentina	10815,715	93%	72%	62%	2,3%	2,8%
Chile	8991,8465	77%	69%	64%	3,1%	3,9%
Malaysia	10551,579	91%	79%	70%	2,6%	3,5%
Korea	11632,599				3,9%	4,9%

*Figure 1.*



*Figure 2.*

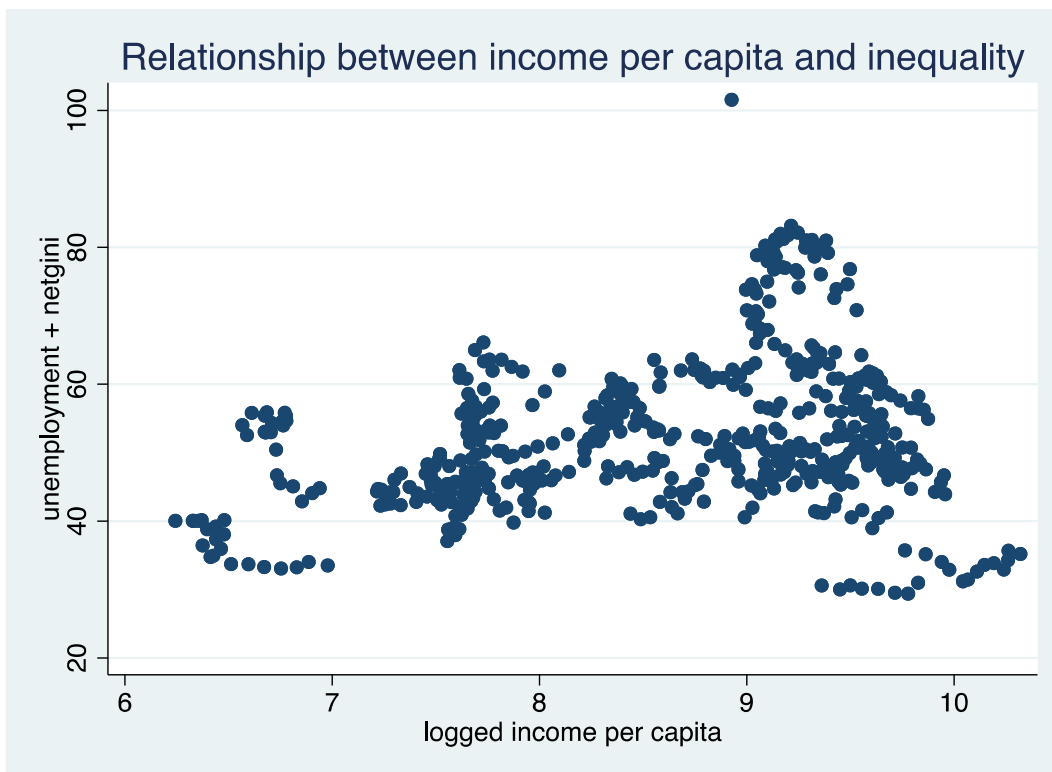


Figure 3.

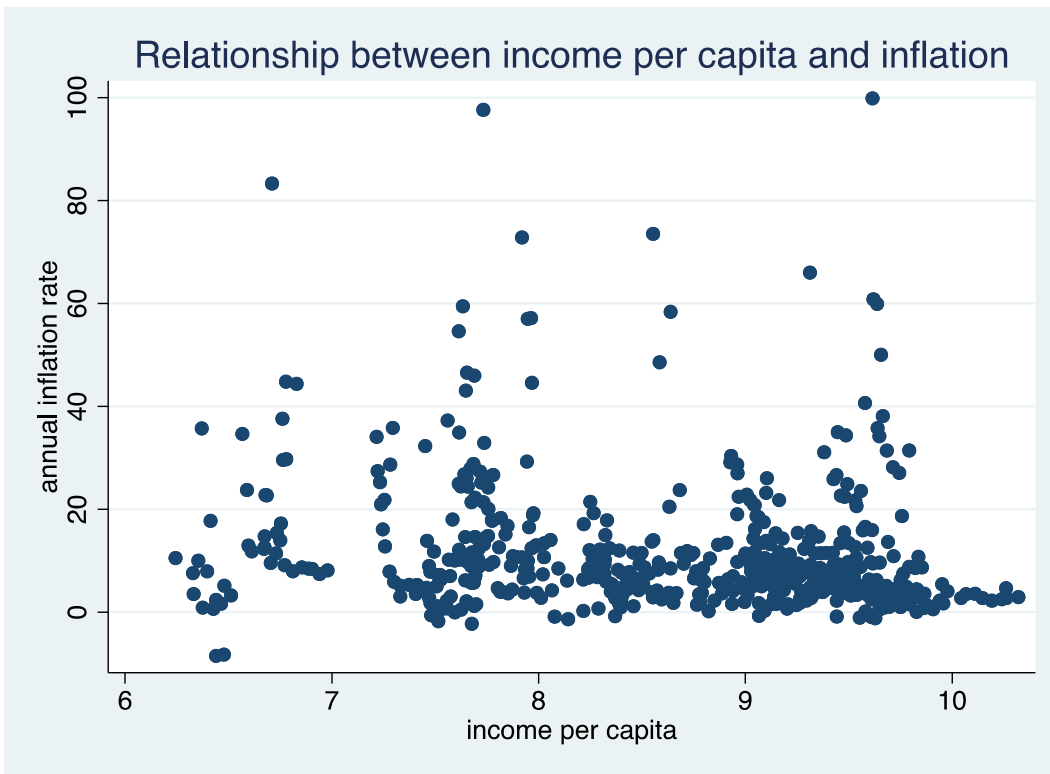
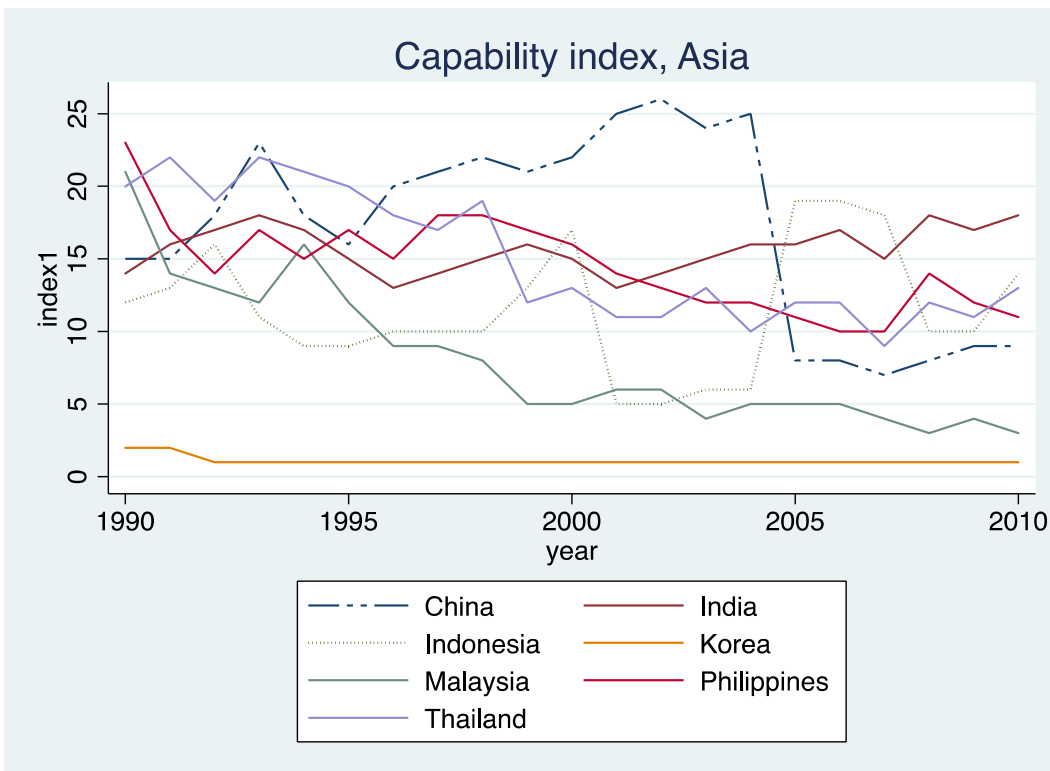
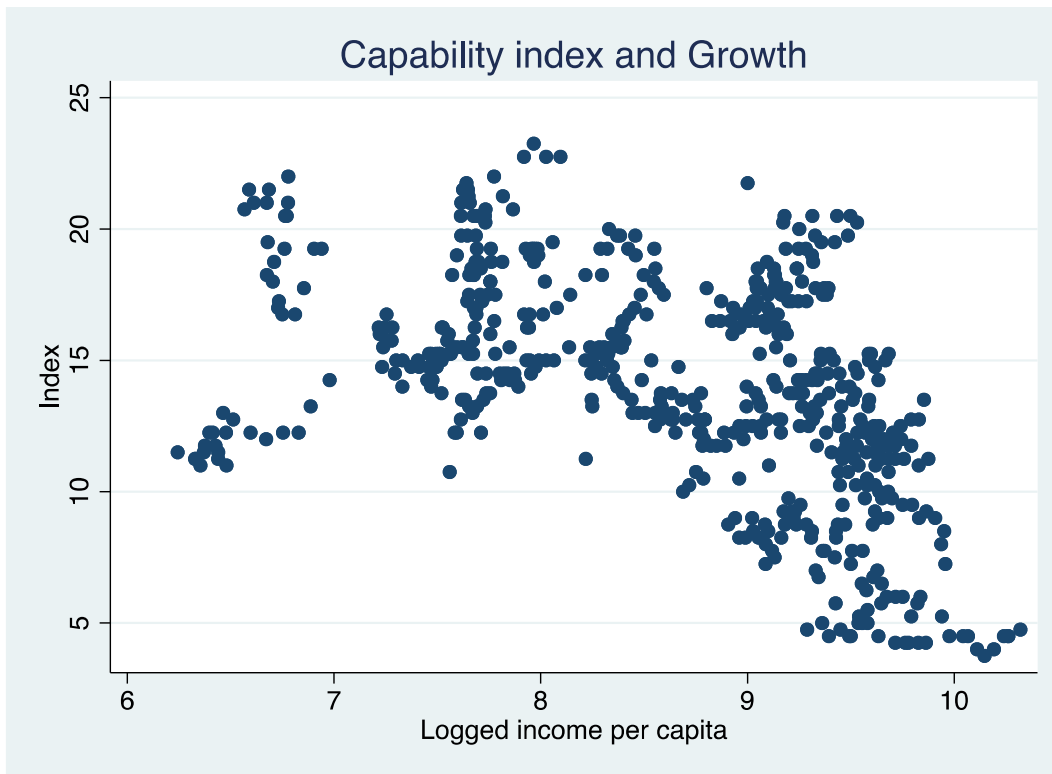


Figure 4.



*Figure 5.*





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