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## Institutions and economic growth: Summary and synthesis
**Adam Szirmai**

**AFD-MGSoG/UNU-Merit Working Paper Series on**
**« Institutions, Governance and Long term Growth »**

In 2010, the French Development Agency (AFD) initiated a partnership with the Maastricht Graduate School of Governance (Maastricht University - UNU-Merit) with a view to exploring the conceptual and econometric relationships between institutions and long-term growth. As a development bank with a long-term lending horizon, AFD is particularly interested in better understanding the determinants of countries' long term economic, social, and political trajectory.

AFD has thus developed a programme on "Institutions, Governance, and Long-term Growth" dealing with the five following dimensions:
  (i)    Measuring institutions and discussing the meaning of such measures, notably through the Institutional Profiles Database;
  (ii)   Testing the econometric relationship between institutional measures and long term growth;
  (iii)  Exploring through a series of country case studies the historical relationship between processes of economic accumulation, forms of political organisation, and social cohesion;
  (iv)   Discussing conceptual frameworks for making sense of the interaction between political, social and economic forces in the process of development;
  (v)    Developing methodologies for political economy analyses.

The MGSoG/UNU-Merit team is involved in the five dimensions with a particular focus on the first two. Its primary objective is to explore the Institutional Profiles Database jointly developed by AFD and the French Ministry of the Economy since 2001. Institutional Profiles Database is unique by its scope (about 350 elementary questions pertaining to all institutional dimensions covering 148 countries in 2012), its entirely free access, and its ambition to incorporate the most recent theoretical advances in the field of political economy.

The present series intends to convey the results of our ongoing research, and in so doing to reflect the wealth of issues that can be fruitfully addressed from an "institutionalist" perspective. We hope that readers will find these papers stimulating and useful to develop their own understanding and research.

Nicolas Meisel (AFD)
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For more information on the programme, please visit our websites:
http://www.maastrichtuniversity.nl/web/Schools/MGSoG/ProjectPages/InstitutionalProfilesDatabase.htm
http://www.afd.fr/lang/en/home/recherche/themes-recherches/institutions-gouvernance-croissance

# Institutions and Economic Growth: Summary and Synthesis

Summary and synthesis of papers of phase II of the AFD/MGSOG project
on institutions and economic growth


By

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# 1 Introduction

This paper provides a summary, overview and synthesis of the findings of the second phase of the AFD/Maastricht Graduate School of Governance research project on institutions and economic growth. The point of departure for this research project is that the diversity of long-run patterns of economic growth and development can only be fully understood if one incorporates institutions, institutional diversity and institutional change into the analysis of economic development.[1]

Following Douglass North, institutions are defined as "the rules of the game in a society or, more formally, the humanly devised constraints that *shape human interaction*. In consequence they structure *incentives* in human exchange, whether political, social, or economic." (North, 1990). Gehlen (1958) defines institutions as a "regulatory agency, channelling human actions in much the same way as instincts channel animal behaviour". This second definition is consistent with that of North, but emphasises the differences between human societies governed by institutions and animal behaviour regulated by instincts. Institutions are not just any rules that shape human interactions; they refer to complexes of rules regulating the central problems of social life such as control of violence, family relationships, and economic production. These rules are deeply embedded in human consciousness through education and socialisation and are transferred from generation to generation.

It is important to make a clear distinction between institutions (the rules) and organisations (actors influenced by rules and incentives). One should also distinguish between institutions, which regulate specific spheres of human interaction and the more general concept of culture which captures a broader set of values, norms and cognitions that characterise societies. Institutions are supported by culture, but are oriented to specific spheres of interaction. Cultural elements can buttress institutions, but are not identical to them.

Next, we are not just interested in institutions per se but specifically in the kind of institutions that promote growth and poverty reduction: the humanly devised constraints that provide positive incentives for actors to engage in capital accumulation, educational investment, invention, innovation and incentives to provide and maintain social stability.

The AFD/MGSoG research programme on institutions and growth has a number of related aims:

- Contribute to a better theoretical and empirical understanding of the institutional sources of growth and development
- Contribute to a better theoretical and empirical understanding of the institutional sources of variations in growth performance
- Contribute to better empirical measurement of institutions, using data from the Institutional Profiles Database and other institutional databases

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- Explore methodological issues in quantitative research on the relationships between institutions and economic development
- Explore the possible uses of the institutional profiles database (IPD) developed by AFD in research, thereby contributing to the international visibility of the IPD database.
- Exploring the policy implications of the role of institutions in economic development

Work on the research programme commenced in May 2009. After a preliminary phase lasting from May 2009 till November 2010, the first phase of the research programme started on 20 November 2010 and ended on 31 December 2011. The second phase of the project was executed between June 2012 and 31 May 2013. The project was funded by AFD.

During a preliminary phase of the programme (May 2009 - November 2009) a new wave of institutional data was collected for the Institutional Profiles Database (IPD). During the second phase of the programme, data were collected for the 2012 wave of the IPD. Over time the Maastricht research team has contributed to the further refinement of the questionnaire and to methodological discussions with regard to the process of data cleaning, coding, aggregation and the organisation of the database. The 2009 and 2012 data are now available online, along with results of earlier waves in 2001 and 2006. The data can be accessed via the website of the Maastricht Graduate School of Governance: http://mgsog.merit.unu.edu/ research/IPD/data.php and the website of AFD and CEPII: http://www.cepii.fr/IPD.asp


During phase one of the project the following working papers were produced, all of which have been posted on the UNU-MERIT/MGSOG website: www.merit.unu.edu/research/ipd/ publications) and/or mgsog.merit.unu.edu/research/IPD/publications.php:
- Adam Szirmai**, *Proximate, Intermediate and Ultimate Causality: Theories and Experiences of Growth and Development*, UNU-MERIT Working Paper Series 2012-32/Working Paper Series on Institutions and Economic Growth, IPD- WP01.
- Richard Bluhm and Adam Szirmai, *Institutions and Long-run Growth Performance. An Analytic Literature Review of the Institutional Determinants of Economic Growth*, UNU-MERIT Working Paper Series 2012-33/Working Paper Series on Institutions and Economic Growth, IPD- WP02.
- Luciana Cingolani and Denis de Crombrugghe, *Techniques for Dealing with Reverse Causality between Institutions and Growth*, UNU-MERIT Working Paper Series 2012-34/Working Paper Series on Institutions and Economic Growth, IPD- WP03.
- Kristine Farla and Denis de Crombrugghe, *Preliminary Conclusions on Institutions and Institutional Performance*, UNU-MERIT Working Paper Series 2012-35/Working Paper Series on Institutions and Economic Growth, IPD- WP04.
- Bart Verspagen, *Stylised Facts of Governance, Institutions and Economic Development. Exploring the Institutional Profiles Database,* UNU-MERIT Working Paper Series 2012-36/Working Paper Series on Institutions and Economic Growth, IPD- WP05.
- Luciana Cingolani and Denis de Crombrugghe, *Exploring the Panel Components of IPD,* UNU-MERIT Working Paper Series 2012-37/Working Paper Series on Institutions and Economic Growth, IPD- WP06.
- Kristine Farla, *Institutions and Credit*, UNU-MERIT Working Paper Series 2012-38/Working Paper Series on Institutions and Economic Growth, IPD- WP07.
- Kristine Farla, *Industrial Policy for Growth,* UNU-MERIT Working Paper Series 2012-39/Working Paper Series on Institutions and Economic Growth, IPD- WP08.
- Richard Bluhm, Denis de Crombrugghe and Adam Szirmai, *Explaining the Dynamics of Stagnation. An Empirical Examination of the North, Wallis and Weingast Approach,*

UNU-MERIT Working Paper Series 2012-40/Working Paper Series on Institutions and Economic Growth, IPD- WP09.
- Biniam Bedasso, Lords of Uhuru: *The Political Economy of Elite Competition and Institutional Change in Post-Independence Kenya*, UNU-MERIT Working Paper Series 2012-41/Working Paper Series on Institutions and Economic Growth, IPD- WP010.

The findings and insights of the papers of the first phase were summarised in A. Szirmai and B. Verspagen, *Institutions and Economic Growth. Summary and Synthesis*, January 2012.

During the second phase of the project the following seven working papers were written, all of have been been posted on the UNU-MERIT/MGSoG website:

- Richard Bluhm, Denis de Crombrugghe and Adam Szirmai, *Do Weak Institutions Prolong Crises? On the identification, characteristics and duration of Declines during Economic Slumps*.
- Richard Bluhm, Denis de Crombrugghe and Adam Szirmai, *The Pace of Poverty Reduction Revised. A fractional Response Approach.*
- Samyukta Bhupatiraju and Bart Verspagen, *Economic Development, Growth, Institutions and Geography*.
- Luciana Cingolani, *The State of State Capacities: A Systematic Overview of Perspectives and Evidence on Determinants and Consequences*
- Luciana Cingolani, Kaj Thomsson, Denis de Crombrugghe, *State Capacity, Bureaucratic Autonomy and Millennium Development Goals*
- Kristine Farla, Denis de Crombrugghe and Bart Verspagen, *Institutions, Foreign Direct Investment and Domestic Investment: Crowding Out or Crowding in?*
- Kristine Farla, *Determinants of Firms' Investment Behaviour: A Multilevel Approach*

As spin-offs of the institutions project we can also mention the completion of two PhD theses:
Biniam Bedasso, I*nstitutional Change in the Long Shadow of Elites; Essays on Institutions, Human Capital and Ethnicity in Developing Countries*, defended 10 October 2013
Kristine Farla, *Macro-Economic Studies on Institutions, Policy and Economic Development,* approved, October 2013, defended 2013.


Research during the second phase of the project builds upon the experiences of the first phase and selects certain themes for further elaboration. Thus in the first phase Richard Bluhm, Denis de Crombrugghe and Adam Szirmai argued that in order to understand the long-term process of economic growth, this should be broken down into different growth episodes such as slumps, recoveries or growth accelerations. Their paper - *Explaining the Dynamics of Stagnation* - focused on the determinants of the onset of economic slumps. Their new paper continues the analysis of growth episodes, examining the duration of economic declines. The two papers by Kristine Farla in the first phase analysed institutional determinants of proximate factors that affect growth performance, namely industrial policies and financial credit. Two new papers expand on the examination of the determinants of proximate sources of growth, now zooming in on the crucial role of foreign and domestic investment and their determinants. Using data from the 2009 IPD survey, Samyukta Bhupatiraju and Bart Verspagen test key hypotheses derived from the institutionalist literature regarding the relative importance of geography, institutional characteristics and economic openness. Two papers by Luciana Cingolani and her co-authors select one institutional sphere as an

important subject for in-depth empirical and theoretical analysis, namely state capacities. Finally Richard Bluhm, Denis de Crombrugghe and Adam Szirmai focus on one of the very important institutional spheres, namely that of inequality. Using new econometric approaches, they examine the potential contributions of growth and inequality to poverty reduction.

One of the original goals for the second phase of the institutions project was to explore the panel characteristics of the successive waves of the IPD survey. Unfortunately the data for the 2012 IPD came available too late to be included in the analysis. Creating a panel version of the IPD remains one of the interesting challenges for future research. It would allow researchers to shift from cross-section analyses of institutions to a more dynamic approach, allowing for analysis of institutional change over time.

In the following sections the findings of the seven papers of phase two of the project will be summarised and synthesised in a non-technical fashion. For the technical details the reader is referred to the original papers.

## 2 Institutions and the duration of slumps

One of the stylised facts emerging from the research on institutions and long-run economic growth is that there is a strong correlation between institutional characteristics and levels of GDP per capita. Thus, formalisation of rules, well-defined property rights, and constraints on the power of the executive seem to be associated with higher levels of GDP per capita. However, there is a remarkable absence of any correlation between institutional characteristics and growth rates of GDP per capita in the short run. On first sight, this is somewhat paradoxical. If differences in levels of per capita are associated with differences in institutional characteristics, then logically there should be a correlation between long-run growth rates and institutional characteristics.[2]

One reason for this continuing paradox is methodological: there is a paucity of time series on institutions, which go back far enough for the purposes of analysis of long-run trends. However, there is also a substantive reason. As several authors have shown (e.g. Hausmann, Pritchett and Rodrik, 2005), there is no reason why developing countries with poor institutions cannot grow rapidly. Growth spurts can be found across all levels of development. What we learn from the work of authors such as North, Wallis and Weingast (2009), Acemoglu, Johnson and Robinson (2001, 2002), or Hausmann et al. (2005) is that the key question is not whether growth can be started, but whether it can be sustained over longer periods. The argument is that countries with weaker institutions (e.g. 'limited access orders' or 'extractive institutions') find it harder to sustain growth and are more vulnerable to experiencing sustained periods of crisis and stagnation. In other words, rather than focusing only on average growth rates, one should analyse the characteristics of different types of growth episodes.

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[2] Assuming that in the very long run all countries started from similar (subsistence) levels of per capita income.

In the paper *Do Weak Institutions Prolong Crises? On the identification, characteristics and duration of Declines During Economic Slumps* (Bluhm, de Crombrugghe and Szirmai) the key variable of interest is the length of declines in a crisis. Here we provide a non-technical summary of some of the key findings.
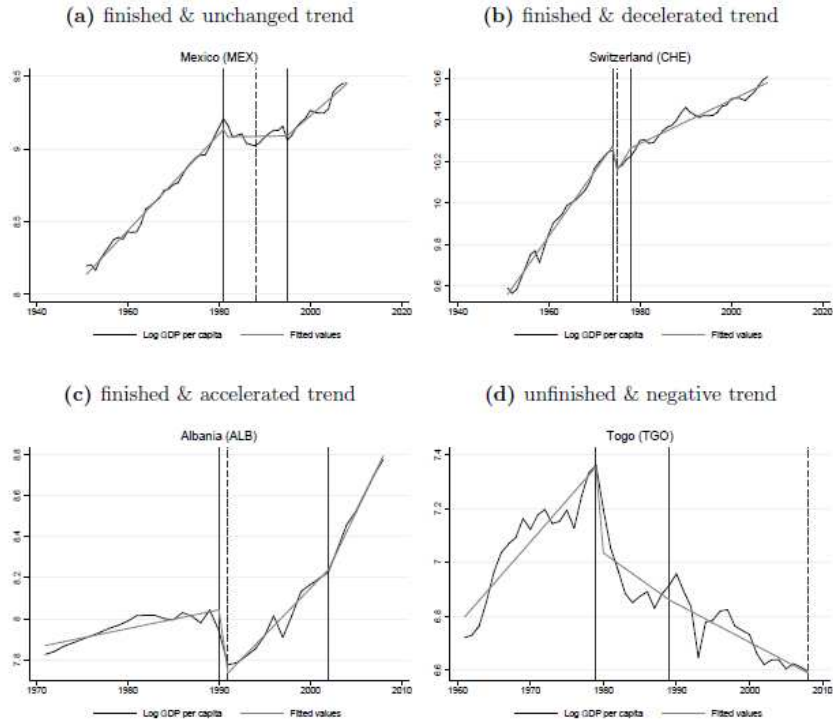
*Identifying slumps*

The first part of the paper develops an econometric methodology to identify slumps. Slumps are defined according to three criteria: 1. A slump is a departure from a previously positive trend; 2. A slump must begin with negative growth in the first year; 3. A slump is a pronounced regime switch, not just a minor business cycle fluctuation. To capture these requirements, a two-break structural equation is specified, which splits time series into three different growth regimes: (1) a pre-slump regime from the beginning of the time series of a country till $tb_1$, (2) a slump/recovery regime lasting from year $tb_1 + 1$ to year $tb_2$, and (3) a post slump regime from year $tb_2 + 1$ onwards. The two break dates are endogenously determined. If the breakpoints meet tests of statistical significance, we have identified a slump. The procedure is repeated for the pre-slump and post slump periods to test whether there is more than one slump in a country during the period of analysis from 1950 to 2008. The end of the slump is defined as the year in which GDP per capita first reaches or exceeds the pre-slump peak.

Once a slump has been identified, it is decomposed into two phases as follows. The decline phase is the period from the onset of the slump till the lowest level of GDP per capita (the "trough") before the end of the slump or, if the pre-slump peak is not reached, before the end of the sample period. The recovery phase is the period between the trough and the year GDP per capita reaches its pre-slump peak again. In this fashion in total 58 slumps are identified for 52 countries between 1950 and 1998. These 58 slumps are our units of analysis.

Figure 1 illustrates some of the diversity of slumps identified by this method. Panel (a) shows a finished slump in Mexico where the trend growth rate is nearly unchanged after the slump. Panel (b) shows a finished slump in Switzerland where the trend growth rate decelerated after the slump. Panel (c) shows a finished slump in Albania occurring at the time of the post-communist transition with an accelerated post-slump trend. Last but not least, panel (d) shows an unfinished slump with two negative trend breaks in Togo. In the case of unfinished slumps, the paper takes the duration between the beginning of the decline and the lowest point of the unfinished decline as the duration.

Subsequently the analysis proceeds in two directions: (1) describing the behaviour of economic and institutional variables in the run up to the slump and after the onset of the slump. (2) identifying the variables that influence the duration of a slump, using survival models.

## Figure 1: Identifying Slumps



**(a) finished & unchanged trend**

Mexico (MEX)

**(b) finished & decelerated trend**

Switzerland (CHE)

**(c) finished & accelerated trend**

Albania (ALB)

**(d) unfinished & negative trend**

Togo (TGO)

*Note(s):* Models refitted using the estimated breaks $\hat{tb}_1$ and $\hat{tb}_2$ but without the optimal AR($p$) terms to emphasize the trend breaks. The bold vertical lines are at $\hat{tb}_1$ and $\hat{tb}_2$, respectively. The dashed vertical line indicates $\hat{t}_{min}$.

## Figure 2: Correlates of Slumps



GDP per capita growth

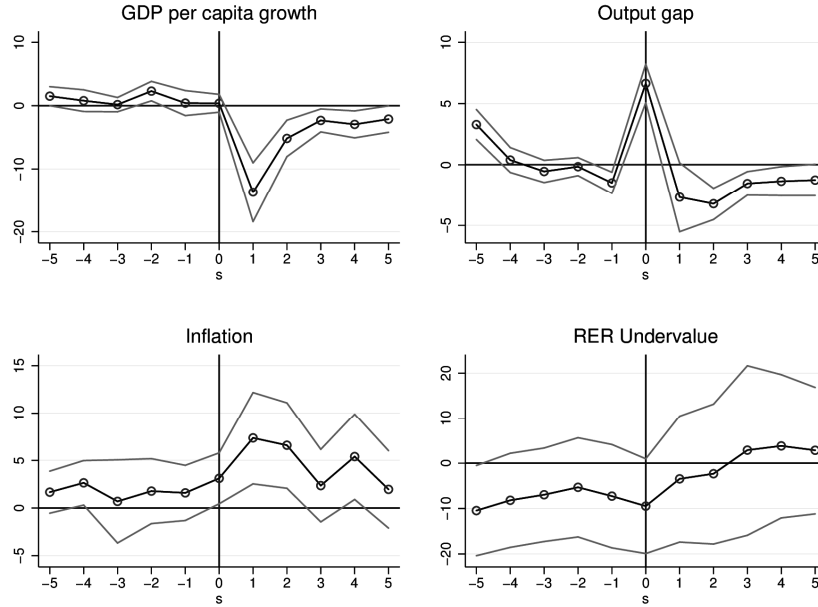Output gap

Inflation

RER Undervalue

Figure 2 provides examples of the first type of analysis (correlates of slumps). In the figure we compare the degree to which a given variable deviates from its normal values (in non-

crisis times) per country, in the five years prior to the start of a slump (a downbreak) and the five years after the onset of the slump. Years are found on the horizontal axis. Year zero is the last year of the pre-slump growth regime (i.e. the year *preceding* the downbreak). Taking the example of inflation, we see that in the five years before a slump inflation rates tend to be slightly elevated compared to an average year outside the 11-year window around a slump, but given the confidence intervals they do not deviate significantly from their normal values. In the five years after the onset of the slump, inflation rates increase and deviate significantly from their normal values. Figure 2 also documents the movements of three other economic variables: real exchange rate undervaluation (increase after the downbreak), GDP per capita (obviously a collapse after the downbreak) and output gap relative to potential (decline after the downbreak). This kind of analysis is repeated for in total 21 economic variables and eight institutional variables.

**Figure 3: Institutional Correlates of Slumps**
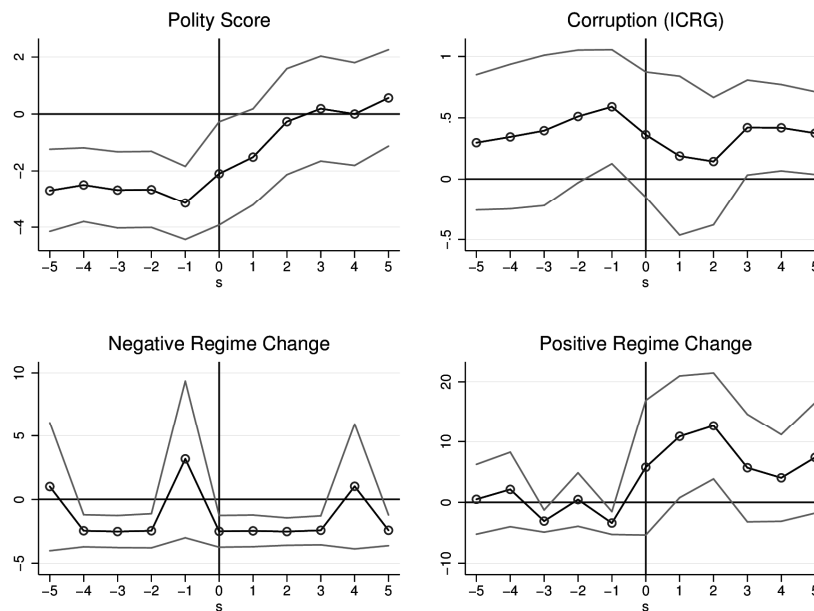


From the perspective of this summary the most important findings refer to some of the institutional variables. Examples are provided in figure 3. Using polity scores, the authors find that the polity score is much lower than in normal times in the run up to a slump, suggesting that worse institutions may contribute to macro-economic instability. After the slump the average polity scores clearly shift upwards, indicating that slumps provide possibilities for institutional improvement or reform. All the sub-components of the combined polity score, including constraints on the executive, show very similar trends.

Next, the paper finds that there is little evidence that negative regime changes precede downbreaks, or occur with heightened probability thereafter. This is interesting as one might expect that negative regime changes are themselves a source of economic instability. What is particularly interesting however is a marked upward trend in the probability of positive

regime changes from the eve of a slump onwards. Although these findings do not constitute causal relationships, slumps seem to provide incentives for positive regime change.

It is often argued that political turmoil, conflict and war contribute to economic instability. This is not reflected by the data in this paper. There is no evidence that there is significantly more war, conflict or irregular leader exit than normal in the five years in the run up to a crisis. This is consistent with the findings on negative regime changes.

Bluhm et al. (2013, p. 20) summarise the findings as follows: "Many indicators and economic aggregates evolve in the expected manner but often represent a mix of endogenous policy responses. For example, higher inflation, a depreciating real exchange rate and a re-balancing of the current account are both testament of the strong price pressures faced by these economies but also of the necessary adjustments that ultimately help to stabilize the downturn. Other covariates behave in interesting ways around the break date. The difference between de facto trade flows and de jure openness is striking and suggests that trade restrictions play an important role for the occurrence of slumps. Additionally, several indicators of exports, financial development and financial integration either switch means around the time the slump hits or remain permanently below the levels of normal times throughout. While this exercise could certainly be extended further with more policy variables, the most interesting and unexpected finding is a switch from significantly lower quality institutions in the run up to a slump back to better scores occurring in the first two years after the downbreak. This indicates that weaker institutions precede the beginning of a slump, while the slump itself offers a window of opportunity for institutional improvements, and thus illustrates the endogenous nature of institutions." The relationship between economic shocks and subsequent institutional change is an interesting avenue for future research. In particular, the hypothesis of institutional improvement in response to economic shocks deserves further attention.

*Understanding the duration of declines*

With regard to variables influencing the duration of declines a large number of variables are considered. Given the rather limited number of observations – 58 decline spells between 1950 and 2008 – there are limits to how many variables can be entered into a regression simultaneously. The paper tackles this problem by defining a base specification with the log of duration of the slump as the dependent variable. The base specification includes two measures of institutions as explanatory variables, namely constraints on executive power and degree of ethno-linguistic fractionalisation. The base specification also includes the real US interest rate as a typical exogenous economic variable and initial GDP per capita (initial referring to year zero, the year before the onset of a slump). Subsequently a whole range of other variables (that passed a variable selection step) are entered into the regressions, in order to see if any of these potentially 'omitted variables' change the estimated relationship between institutions, ethnic heterogeneity and the duration of declines.

Constraints on the executive are the preferred proxy of institutional quality for two reasons. First, it is widely used in the empirical literature as a measure of institutional constraints placed on political actors and has already been linked to macroeconomic volatility (e.g. Acemoglu et al., 2003; Acemoglu and Johnson, 2005). Second, it is more conceptually rooted

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in the economic theory of institutions than any of the broader measures capturing wider aspects of the political regime (e.g. democracy or autocracy). For ethno-linguistic fractionalisation, the paper uses two measures from Desmet et al. (2012), who recently developed a very detailed set of estimates of ethnic cleavages. They compute the probability that two randomly chosen individuals belong to different groups at different levels of 'the language tree'. ELF1 is the most aggregate variable, capturing only crude distinctions such as Indo-European versus non-Indo European languages, and ELF15 represents the most disaggregate level, differentiating among the language groups known today. The paper uses the latter indicator – ELF15 – as its primary measure.[3]

Other variables entered into the regressions include: inflation, de jure trade openness, de facto trade openness, export diversification, export sophistication, the ratio of private credit to GDP, financial depth, the Gini of the income distribution, infant mortality, life expectancy and schooling.

Two very robust results emerge with regard to the institutional variables. First, constraints on executive power always have a significant negative coefficient. In other words, in societies where the power of the executive is constrained through checks and balances declines are shorter than in societies where such checks and balances are weaker. Conditional on having entered a slump, a country with the lowest score on the executive constraints measure is expected to decline for about 9.1 years, while a country with the highest score is expected to decline only for about 3.1 years. The second finding is that, the higher the degree of ethnic fractionalisation, the longer declines will last.

The paper goes on to analyse the interactions between constraints on the executive and ethnic fractionalisation. The reasoning is as follows. Given a political economy in which (latent) social conflict, as measured by ethnic fractionalisation, challenges the ability of political actors to take coordinated action to resolve an economic crisis, better institutions - property rights, constraints on the executive - may help overcome this negative effect. Countries with very high fractionalisation may require particularly strong institutions to compensate for the negative effect of fractionalisations. Countries which are ethnically very homogeneous may get by with weaker institutions.

Figure 4 depicts the impact of different combinations of ethnic fractionalisation and executive constraints on the duration of declines. The shortest declines are found in the upper left corner of the figure, where strong institutions coexist with ethnic homogeneity. The longest declines are found in the lower right hand corner, where ethnic homogeneity is low and institutions are weak. The top right hand and bottom left hand corners of the figure are perhaps the most interesting. In the top right hand corner, declines are short in spite of high fractionalisation due to the strength of constraints on the executive. In the bottom left hand corner, declines are short because of ethnic homogeneity, in spite of weak institutions. The increasing curvature of the contours represents the interaction effect. The authors'

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[3] Ethnic fractionalisation, in turn, can itself be seen as an outcome of long-term processes of state formation. In Africa, colonial boundaries typically disregarded cultural, ethnic and religious divisions. As a result many post colonial states were multi-ethnic states, with weak national legitimacy. Colonial policies contributed to accentuation of divisions along ethnic lines. On the other hand, historical processes of of nation building in the advanced economies contributed to low degrees of ethnic fractionalisation.

interpretation of these results is that stronger institutions have the potential to overcome even very high degrees of latent social conflict or fractionalisation.

**Figure 4: Duration of Declines**
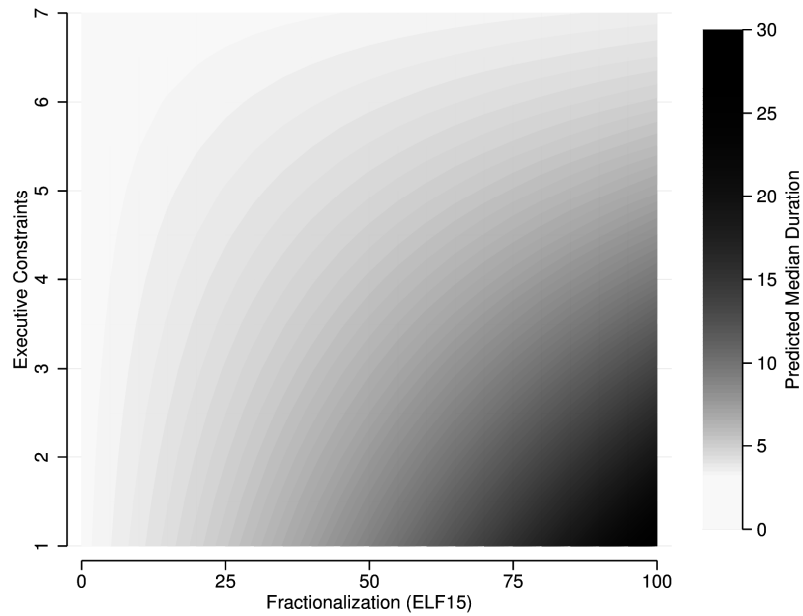


Further examinations of the robustness of the empirical findings show that the coefficient of ethnic fractionalisation is clearly driven by observations from Sub-Saharan Africa. Since SSA has the greatest degree of ethno-linguistic heterogeneity of all regions, this is quite plausible.

As a whole, our results lend broad support to political economy theories stressing the respective roles of institutions and social conflict. Attempts at effective social coordination and responses to slumps are hampered by high degrees of (latent) social conflict as captured by ethno-linguistic fractionalisation. But, strong institutions can put the coordination and legal mechanisms in place that are able contain or resolve these conflicts within the institutional framework (as, for example, in North et al., 2009). Also, these results give rise to the interesting and rather novel proposition that in less fragmented societies (as measured by the index of ethnic heterogeneity), institutions are much less important as a determinant of the length of declines. These results do not suggest that sound macroeconomic policies as such do not matter, but they provide indications that policy may be secondary to these more fundamental factors.

Finally, these findings show the fruitfulness of decomposing long-run growth performance into growth episodes and analysing each type of episode – growth accelerations, slumps, recoveries – separately. The paper shows that slumps matter a lot for long-run growth performance and that the decline phase of a slump can last very long in some cases. In fact, given that growth is relatively easy to ignite but difficult to sustain, a comparison of the

relative effects of slumps versus accelerations would be an interesting avenue for future research.

# 3 Geography versus institutions

In *Economic Development, Growth, Institutions and Geography*, Samyukta Bhupatiraju and Bart Verspagen revisit questions raised in a well-known paper by Rodrik et al. (2004) with regard to the relative importance of institutions, geographic factors and openness to trade as determinants of economic growth.

One of the contributions of the paper is that it uses more comprehensive measures for economic performance, for institutions and for geography along with a more commonly used measure of trade performance. The paper argues that economic development, institutions and geography are all multi-facetted phenomena and to capture them in a single indicator, as is often done in the literature is problematic. For institutions, the paper makes use of data from the 2009 wave in the Institutional profiles database (IPD, 2009). In developing measures of institutions, geographical characteristics and economic performance the paper makes use of factor analytic techniques, but with a special spatial characteristic. This is the second contribution of the paper. While common factor analytic techniques try to maximise the correlation between separate indicators/variables and underlying latent dimensions, the regional variant of factor analysis maximises the regional correlations of variables such that the factors capture characteristics of existing regions in the world economy.

Using these new methods, the paper aims at assessing three competing strands of theory namely geographic determinism, theories of trade as the engine of growth, and institutional theories which emphasise the primacy of growth promoting institutional characteristics. The geographic literature emphasises the importance of characteristics such as climate (moderate climate is seen as conducive to growth), soil quality, disease environment, location (landlockedness is seen as a negative factor, locations with good access to the sea and trade routes are seen as positive) and natural resources, such as oil, gas or minerals (which are either seen as a blessing or a curse depending on the theory in question).

Openness to trade and the efficiency gains associated with following international comparative advantage have traditionally been seen by economists as an important driver of economic growth. It is argued that policies that promote openness will result in more positive growth performance.

Since 1990, institutional economics has argued that the prime factor explaining differences in growth performance is the quality and characteristics of institutions. As has been shown in the papers of this project institutional characteristics are measured in many ways, such as protection against expropriation, strong protection of property rights, the rule of law and constraints on executive power, control of violence, a democratic polity, the capacity of the state to implement policy and so forth.

In the econometric analysis of these theories, researchers are always confronted with the problem of *endogeneity*. The factors that supposedly explain growth performance may themselves be determined by other factors including growth itself. Thus, growth-friendly institutions may be the result of prior successful growth experiences. Trade openness may be

a function of good institutions or prior economic development. This makes it difficult to identify causal relations in the real world as well as in econometric analysis. One of the statistical solutions for the problem of endogeneity is to search for instrumental variables, variables that are correlated with the endogenous regressor(s) in question, but not with the regression errors (see the paper by Luciana Cingolani and Denis de Crombrugghe, *Techniques for Dealing with Reverse Causality between Institutions and Growth, UNU-MERIT Working Paper Series 2012-34/Working Paper Series on Institutions and Economic Growth, IPD-WP03.).* The present paper also makes use of instrumental variables. Thus openness is instrumented by variables from the so-called gravity equation, where the volume of trade between two countries depends on factors such as the size of the two economies and the distance between them. For institutions, the paper uses instruments such as the mortality of colonial settlers (derived from Acemoglu et al. 2001) and related instruments such as the proportion of the population speaking English or languages of European descent.

For institutional variables, the paper makes use of the IPD database. Applying spatial factor principal component analysis (SPCA) the paper derives two measures of institutional characteristics. It differs from regular PCA in terms of the objective that it sets when producing the summary variables (components). In regular PCA, the objective is to maintain a maximum fit between the summary component and the original variables. In the spatial version of PCA (SPCA), the objective is to produce a summary measure that produces maximum spatial correlation with itself. Spatial correlation is measured by the Moran coefficient, and is essentially a measure of how spatially concentrated the underlying phenomenon is. High spatial correlation means that country with high values on a given variable tends to be surrounded by other countries with high values on the same variable (For more methodological details the reader is referred to the original paper and Verspagen 2012).

For institutions, two latent dimensions (components) have been derived. The first component is a measure of "Westernness", similarity to Western type institutions. The advantage of this term is that it avoids rather ideological formulations such as good governance or high quality institutions. But some of the typical characteristics of this underlying dimension are the degree of formalisation of social relationships, democracy, civil rights, transparent justice systems and free markets. Broadly speaking, the kind of institutional features that are stressed in the second component are those that are associated with a stronger role of the government in economic and social life. The following two figures describe the geographic distribution of institutional characteristics.

**Figure 5 Institutions from the IPD database, first component**
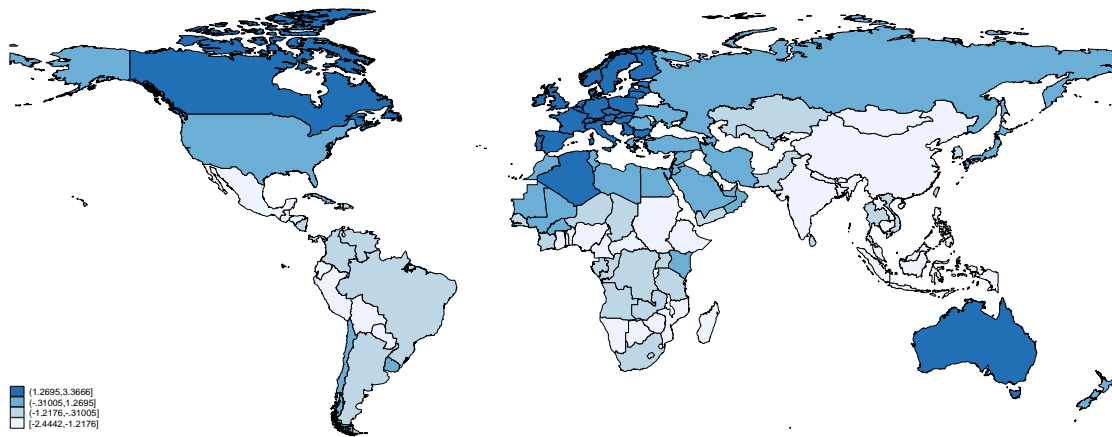


The first component, depicted in figure 5, is clearly a measure of "Western Institutions" where the authors use "Western" for describing Europe and its offshoots (North America, Australia and New Zealand).

Figure 6 displays the second component. This is again clearly spatially concentrated but now the spatial pattern points to high values in the East as well as in some parts of Europe. Broadly speaking the kind of institutional features that are stressed in this second component are those that are associated with a stronger role of government in economic and social life. Africa is an interesting case, as it shows a broad East-West division in itself.

**Figure 6 Institutions from the IPD database, second component.**
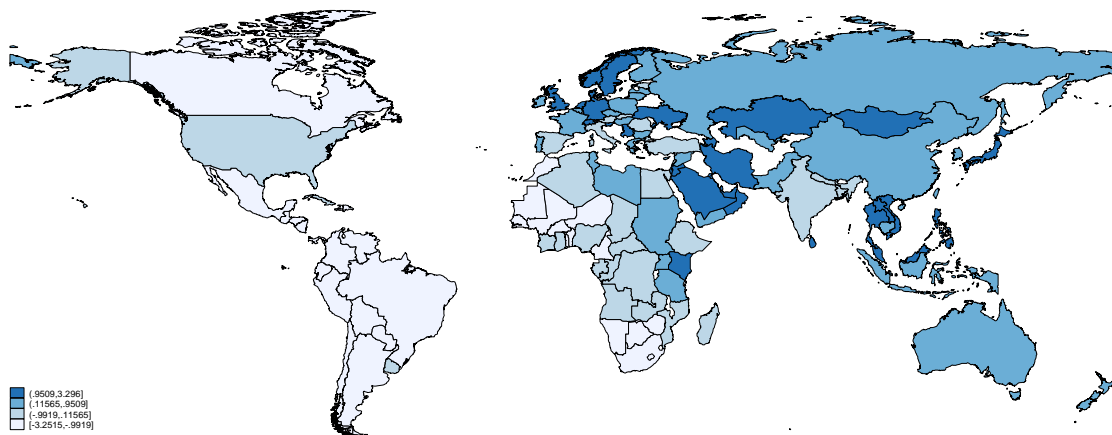


Applying spatial principal component analysis to a variety of geographical variables two dimensions are derived. The first is called GEOAREA. It is based on physical characteristics such as access to waterways, distance to the equator or climatic zone. The second dimension GEOSOIL is based primarily on soil quality indicators.

The economic performance measures are also constructed using spatial principal components analysis. These indicators are thus clearly broader than conventional measures of GDP per capita or growth of GDP per capita. The first component captures the general level of development which depends among others on GDP per capita in 2000, share of consumption in GDP and - negatively - on population growth. The second component captures overall growth in the context of catch up. It depends on a relatively low initial GDP per capita, combined with a relatively high growth rate, high openness to trade, high investment rates and low population growth. The indicator captures an overall growth or development orientation.

The empirical analysis proceeds in two stages. First the endogenous variables institutions (INS) and Openness (OPENC) are regressed on other variables, according to the logic of instrumental variable regression explained above.

$$INS_i = \mu + \phi_4 ENGFRAC_i + \phi_5 EURFRAC_i + \phi_6\ FR_i + \phi_7\ GEOAREA_i + \phi_8\ GEOSOIL_i + \varepsilon_{INSi}$$
(1)

$$OPENC_i = \gamma + \phi_9 ENGFRAC_i + \phi_{10} EURFRAC_i + \phi_{11}\ FR_i + \phi_{12}\ GEOAREA_i + \phi_{13}\ GEOSOIL_i + \varepsilon_{OPENCi}$$ (2)

where INS stands for institutions and OPENC for trade openness. GEOAREA and GEOSOIL are the geographic variables, ENGFRAC is the % of English speakers and EURFRAC is the percentage of the population speaking European languages.

FR is the Frankel Romer instrument for foreign trade, which captures the geographic influences on trade as a percentage of GDP. FR is estimated in a separate gravity regression equation. Note that the regression for institutions is run twice, once for the first component and once for the second component.

Subsequently the predicted values of Institutions and Openness are entered in the final equation with the three key variables: Institutions, Openness and Geography:

$$\log y_i = \alpha + \beta_1\ INS_i + \beta_2 OPENC_i + \beta_3 GEOSOIL_i + \varepsilon_i \qquad (3)$$

This regression is run in four different versions: 1. taking the first development component as the dependent variable and using the first institutional dimension as an explanatory variable 2. taking the first development component as the dependent variable and using the second institutional dimension as an explanatory variable; 3. taking the second development component as the dependent variable and using the first institutional dimension as an explanatory variable; 4. taking the second development component as the dependent variable and using the second institutional dimension as an explanatory variable. The paper also compares specifications using variables derived with regular principal components analysis and variables derived with spatial principle component variables. Note that the analysis in this paper is cross-sectional in nature.

The findings of the paper can be summarised as follows:

1. Institutions and trade openness are indeed endogenous variables, so that instrumental variable analysis is required (the two stage procedure described above).

2. The results point to an important role of institutions in explaining the level of development. The two institutional variables are the only ones that are systematically significant in the two-stage instrumental variable regressions. The first component - Western type institutions - has the clearest positive relation with level of development. In this sense the analysis is in line with that of Rodrik et al. (2004).

3. The geographic approach to measurement makes a significant difference. Comparing normal principal components analysis (PCA) with spatial principal components analysis (SPCA), institutions do not have a robust significant effect on level of development using PCA versions of the variables. They do when one uses SPCA. The authors conclude that "institutions indeed are a (the) primal factor behind economic development, but only if we take into account that institutions themselves are strongly geographically concentrated'' (Bhupatiraju and Verspagen, 2013, p.18). Even of one does not see a direct impact of geography on levels of economic development, one should keep in mind that the institutional variables are spatially weighted, so that 'space' does matter.

The implications of these spatial analyses are that one should think less abstractly about institutional characteristics. They are not unique to a single country, but develop in spatial contexts. These spatial contexts are characterized by shared historical experiences.

4. Taking the second growth related economic performance variable as dependent variable the results are very different. First, institutions are not the only factor. Trade and geography also contribute to explaining economic performance. Trade openness has a positive effect as does soil quality. Next, the "Western Institutions" variable seems to contribute negatively to development. This reflects the fact that the countries experiencing rapid growth and catch up are presently typically non-Western economies. Somewhat surprisingly the second institutional variable, government role in the economy, does not have a significant effect. The conclusion is that institutions no longer trump the other factors when one considers a more dynamic picture of economic development.

5. Generally the instruments that are available so far are rather weak, which means that conclusions have to be cautious. One of the important avenues for future research is to find stronger instrumental variables that are available for large samples of countries.

# 4 Institutional determinants of investment behaviour

The previous two papers discussed above examine the connections between institutional characteristics and measures of aggregate economic performance (duration of slumps, levels of economic development, and growth rates of GDP per capita). The two papers discussed in this section try to unbundle the relationships between institutions and economic development, by focusing on one of the key intermediate drivers of economic performance namely

investment. Questions to be examined in this context are: how do institutional characteristics affect the volume of foreign and domestic investment, how does foreign investment affect the volume of domestic investment, do foreign firms invest more than domestic firms and in general what are the determinants of investment behaviour?

## 4.1 How do institutions influence the effects of FDI on domestic investment?

In *Institutions, Foreign Direct Investment and Domestic Investment: Crowding Out or Crowding in?*, Kristine Farla, Denis de Crombrugghe and Bart Verspagen examine important questions about foreign direct investment and its relationships with domestic investment.

In the present day international economic order foreign direct investment is widely seen as a key factor in the economic development of LDCs and emerging economies. Foreign direct investment (FDI) is the type of capital inflow from abroad that is most directly related to the productive capacity of a country. Its effect of transferring foreign know-how and technology, creating additional investment funds and even improving labour standards is often seen as one of the important benefits of globalisation for growth and development of relatively poor countries. Its importance as a source of external finance has increased dramatically, now far exceeding the contributions of aid flows. Many countries in Asia, Latin America and Africa have adopted special policies to attract foreign investment, including investment treaties, preferential taxation schemes and preferential loans. Countries that were previously closed and hostile to FDI such as China and India now welcome such investment. While post-war Japan and South Korea kept foreign investors at arm's length and found other ways to acquire foreign technological knowledge, the increasing control of technological knowledge by multinationals seems to make FDI indispensable for access to technology and economic growth.

This paper takes a critical look at FDI and its assumed benefits. It singles out the following questions for empirical analysis:

- What is the effect of foreign investment on the volume of private investment and the volume of gross fixed capital formation? Will an inflow of FDI result in more private investment (Crowding In) or in less private investment (crowding out)? Will an inflow of FDI result in more gross fixed capital formation (crowding in) or less gross fixed capital formation (crowding out).

- Which institutional characteristics contribute to higher levels of private investment (foreign as well as domestic)? It is generally accepted that private investors will prefer to invest in countries with secure property rights and a stable institutional setting. Thus, good governance is expected to have a positive effect on overall private investment.

- What role do institutions and governance have on the relationship between FDI and total investment, more specifically on whether FDI crowds in or crowds out domestic private investment?

Additional questions raised in the paper, though not explicitly incorporated in the empirical analysis are:

- If there is crowding out, does this have a positive effect on the productivity of domestic firms, if market entry of foreign owned firms pushes the least efficient domestic firms out of the market?

- Does FDI have positive productivity spillovers (through transfer of know-how or technology) to domestic firms?

- Are foreign-owned firms more productive than domestic firms?


The relations between institutions, FDI and domestic investment as described in the secondary literature are very complex. It is not surprising that the findings of the literature are so far inconclusive. The following mechanisms and relationships can be identified in the literature:

a Corruption tends to have negative effects on the volume of domestic private investment. Improved governance will have a positive effect on domestic private investment.

b Institutions such as legal protection, rule of law, investment treaties, trade agreements, political stability, government efficiency, control of corruption and financial supervision have positive effects on the inflow of FDI.

c If FDI itself is motivated by rent seeking, increasing inflows of FDI will crowd out domestic investment.

d. Investment unfriendly regimes (bad governance) have a negative effect on domestic private investment. As foreign investors have more leverage, domestic investors may turn to foreign partners. Thus, the negative effects of bad governance on total investment may be somewhat mitigated by increases in inward FDI, but the share of domestic investment will decline. So this results in crowding out of domestic private investment.

e Elite rent seeking (in the tradition of North et al., 2009) may influence the behaviour of foreign and domestic investors. In limited access orders (LAOs) elites capture rents by reducing competition, limiting access to trade and resources and restricting entry to organisations. One possible effect on investment is that rent seeking by members of elite coalitions may have stronger negative effects on domestic investors than on foreign investors. Domestic elites may have reasons to grant foreign investors preferential market access. Thus, domestic investors who do not have access to elites are excluded and may be crowded out. In this case, rent seeking by domestic elites (bad governance) would be positively related to FDI inflows, but domestic investors would be crowded out. These outcomes are similar to those discussed in the previous paragraph, but the mechanisms are somewhat different.

f Alternatively domestic elites may impose stronger restrictions on foreign ownership in industries where they collect large rents from domestic investment. If this is the case, high levels of rent seeking by domestic elites will be negatively related to FDI inflows. Under

such conditions, better governance would result in more inflows of FDI and less restrictions on domestic private investment. The interactions between governance and FDI would be positive. If both positive and negative mechanisms operate simultaneously in different sectors of the economy, the net effects may be hard to disentangle.

g   Finally, institutions may affect the spillovers from foreign to domestic firms. Certain institutions - e.g. strong intellectual property rights - may encourage high-tech investments and positive knowledge spillovers. If these spillovers are high, FDI will crowd in domestic investment because it raises the rates of return to domestic private investment. In this case, the interaction effects between institutions and FDI would be positive. Better institutions, encourage more FDI and result in more spillovers, and therefore in less crowding out.

Thus, there is a variety of possible positive and negative mechanisms with regard to the effects of institutions and governance on crowding in or crowding effects of FDI. The paper attempts to examine the effects of FDI using a regression framework for a panel dataset of developing and emerging countries. In this analysis a negative sign of the coefficients of interaction terms between FDI and governance indicators is interpreted as an indication that the rent seeking effects of FDI  (argument e) are stronger than the positive effects of FDI spillovers (argument g). A positive sign is interpreted in the opposite fashion, the positive effects of FDI spillovers are stronger than any negative effects of rent seeking.[4]

The starting point for the analysis is an equation derived from Morrissey and Udomkerdmongkol (2012):

$$DPI_{i,t} = \beta_0 + \beta_1 DPI_{i,t-1} + \beta_2 FDI_{i,t} + \beta3 GROWTH_{i,t} + \beta_4 PUBLIC_{i,t} + \beta_5 WGI_{i,t}$$
$$+ \beta_6 WGI_{i,t} * FDI_{i,t} + \varepsilon_{i,t}. \qquad (4)$$

Here, DPI is domestic private investment as a fraction of GDP, FDI is FDI as a percentage of GDP, PUBLIC is public investment as a percentage of GDP, GROWTH is past GDP growth, and WGI is one of several indicators on governance and institutions. WGI*FDI represents the interaction between institutional characteristics and FDI. Empirical analysis based on this equation generally results in a significant negative effect of FDI on domestic private investment, i.e. crowding out.

However, the paper goes on to criticise the Morrissey and Udomkerdmongkol (M&U) specification and develops various alternative specifications, all of which point to crowding in effects.

The contributions of the paper lie in two areas, namely improved estimation techniques and better separation of FDI from private investment. The paper proposes several modifications to the system GMM specifications. for which the reader is referred to the original paper. With regard to data, one of the problems in the literature is the separation of FDI from domestic investment, which is far from easy. National accounts indicators of investment such as Gross

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[4] Note that the interpretation of the interaction term is open to discussion. Different arguments involve different kinds of rent seeking, e.g. by domestic elites (argument e) or by foreign firms (argument c). Argument f also provides a setting where the sign of the interaction term would be positive: better institutions result in more FDI and less restrictions on domestic investors. There is no empirical way in which we can distinguish between the various interpretations of the interaction term, but the one chosen in the main text seems the most plausible one.

Fixed Capital Formation (GFCF) include both domestic and foreign investment. Next, GFCF focuses on new capital formation, while FDI is a financial balance of payments concept. FDI includes both investment in existing capacity (e.g. takeovers) and investment in newly installed capacity (Greenfield investment). Thus the non-Greenfield part of FDI is not part of GFCF. A further problem is that while Greenfield FDI is a part of GFCF, GFCF may also include foreign-controlled investment that is not included in Greenfield investment. This is the case when an existing firm that is foreign-owned invests in the domestic economy using part of its own profits. Also, FDI is often measured as a net flow (the net balance of inward and outward FDI), while to be consistent with GFCF, only inflows of FDI should be taken into account.

The paper experiments with a range of alternative investment concepts and concludes that the choice of the investment concept has a large impact on the empirical conclusions. All of the regressions with these alternative investment variables as dependent variable point to crowding in, rather than crowding out.

Investment concepts used as dependent variables in this paper include the following:

- Private Investment (PI). Using the dataset of Morrissey and Udomkerdmongkol (M&U), the authors construct a measure of private investment PI as the sum of domestic private investment (DPI) and inflows of FDI.

- Gross Fixed Capital Formation (GFCF). Using the data of M&U, GFCF is calculated as the sum of private investment (PI) and public investment (PUBLIC).

- Gross Fixed Capital Formation (GFCF*) from the World Development Indicators

- Investment share of PPP converted GDP per capita (GCF) from the Penn world Tables

With regard to the explanatory variables, the authors also add a variable measuring the stock of FDI as a ratio of GDP (STOCK) from UNCTAD.

The variable used to measure institutional quality (WWGI) is constructed as follows. The authors use the Kaufmann et al. data which M&U treated using an unobserved components model and construct a composite and dichotomous governance indicator. WWGI is constructed by estimating the first principal component of the governance indicators used by M&U. The principal component is denoted WWGIPC. The authors construct a dummy variable that has the value '1' when a given country scores higher than the 50th percentile on WWGIPC (in every year).

In some of the regressions the authors add more specific indicators for private and public rent seeking behaviour, using the perception-based indicators from the Global Competitiveness Index (WCI), which are collected by the World Economic Forum.

The authors examine a wide range of regression specifications in the light of the methodological discussion regarding concepts and estimation methods. The substantive results of the paper can be summarised as follows.

- Overall the findings suggest that the accuracy of the results in the literature are severely affected by the empirical difficulties in disentangling foreign capital formation from

domestic capital formation and by choice of estimation methods, in particular the implementation of the GMM methods.

- In a wide range of specifications in this paper, foreign direct investment positively influences a country's domestic level of investment. Thus, there is strong evidence for crowding in rather than for crowding out. This strongly contradicts results of earlier research and is one of the main findings of the paper.

- There is weak evidence that higher scores on governance indicators have a positive effect on private investment, implying that better governance results in higher rates of private investment (private investment being the sum of domestic private investment and foreign direct investment).This suggests that improvements in governance would result in higher rates of domestic as well as foreign investment.

- The signs of the coefficients of interaction terms between good governance and FDI are consistently negative and significant. Thus, on the basis of the interaction between good governance and FDI, there is a negative mediating effect of good governance on both total private investment and total gross fixed capital formation. This is because the overall positive relation between FDI and private investment (Crowding In) is weakened. Good governance has a negative effect on the relationship between FDI and private investment. The authors' interpretation of this finding is that under good governance there may be more inflows of foreign investment. But rent seeking (argument e above) results in foreign investors' preferential access to certain sectors of the economy, at the expense of domestic private investors. According to the authors, the empirical results suggest that the negative effects of rent seeking dominate the possible positive effects of spillovers

This is an interesting and not uncontroversial finding, which however does raise some further questions. On first sight, one would expect improvements in governance to be associated with less private and public rent seeking activity rather than more. Also, most of the interaction terms used do not really allow the researchers to distinguish between rent seeking behaviour by domestic political elites, domestic investors or multinational firms. Unscrambling these interactions is a challenging and interesting avenue for future research. A better understanding of how institutional and policy reforms impact on rent seeking behaviours of different kinds of investors is of considerable policy relevance.

## 4.2 Do institutions have an impact on the contribution of Foreign Investment to economic development?

In the previous paper, the relationships between institutional characteristics, foreign investment and domestic investment were investigated at macro-level. But relationships at macro-level may mask a great variety of firm investment behaviours at the micro-level. *In Determinants of Firms' Investment Behaviour: A Multilevel approach*, Kristine Farla raises the question to what extent firm-level factors influence investment behaviour, using micro-datasets. She combines this with macro-analysis by also entering country level characteristics into the analysis, thus providing an example of multilevel analysis. This paper continues the process of unbundling the relationships between institutions and economic performance by focusing on one specific important economic variable, namely the investment behaviour of firms.

The main questions addressed in the paper are twofold. First, do foreign owned firms invest more than domestic firms? Second, to what extent does a country's institutional, political stability and macro-economic environment affect investment behaviour?

With regard to the first question, the author notes that if foreign investors have better access to finance, attracting foreign investors (i.e. in terms of equity ownership shares) can be an important source for the accumulation of capital. On the other hand, foreign investors may choose to operate relatively more intensely in industries that require less long-term investment commitments. With regard to the second question, there is a large macroeconomic literature that suggests a strong relation between institutions, political stability, and investment (see also section 4.1). The multilevel set up of this paper allows the researcher to analyse such relationships using both macro data at country level and firm-level micro data.

The study is primarily based on firm data from the World Bank Enterprises Surveys. The dataset covers the period 2006-2011. The dataset comprises 45480 firms, 121 surveys and data for 101 developing and emerging economies (20 countries are surveyed twice). In the process of data cleaning 14759 firms are excluded from the analysis.

There are two dependent variables in this study, namely the decision to invest (does a firm invest in a given year) and the intensity of investment (the investment to sales ratio in a given year).

Foreign ownership is measured with help of dummy variables. The first dummy takes the value of one if there is any foreign ownership of firms. The second dummy takes the value one if there is full foreign ownership (100 per cent). Additional micro level variables are firm size (number of employees), labour costs (as ratio of sales revenue), export orientation (a dummy variable with value one if a firm has any exports) and economic sector. Three dummy variables measure perceived obstacles that could inhibit investment, namely lack of access to land, lack of access to finance and competition from informal sector firms

The following macro variables are included in the analysis as control variables. The author controls for real GDP per capita (GDP) in constant prices, and growth measured as the logarithmic change in GDP with respect to the previous year (Growth) from Heston et al. (2012). Moreover, she control's for a country's degree of de jure financial openness using data collected by Chinn and Ito (2008) (updated to 2010) and de facto trade openness using data from Heston et al. (2012). In addition, the author controls for the percentage of real interest rates using data from World Bank (2012).

A country's institutional characteristics are measured using two proxies. First, property rights protection (Property) is measured using data from the Heritage Foundation (2013).11 Second, data from Transparency International (2011) is used to measure control of corruption (CPI). Additionally a proxy for political stability is used from Marshall and Jaggers (2009) in the regression analysis. Polity2 measures the degree to which the political regime of a country approximates either a democratic or an autocratic regime. Higher values of Polity2 correspond to more democracy.

The basic multilevel regression model takes the following form:

$$y*_{ij} = \beta_1 + \beta'_2 x1_{ij} + \beta'_3 x2_j + \varepsilon_{ij} + v_j \qquad\qquad (5)$$

Where y is the latent investment variable, i refers to the firm and j to the country.

$x1_{ij}$ is a vector with the firm-level explanatory variables. $x2$ is a vector of country-level variables. The composite error component contains a micro-level error term $\varepsilon_{ij}$ and a macro-level error term $v_j$.

This model is subsequently extended to include the possible effects of institutions and political economy on the relationship between foreign ownership and investment. This is done by adding two interaction terms:

$$y*_{ij} = \beta_1 + \beta'_2 x1_{ij} + \beta'_3 x2_j + \beta_4 \text{P-Foreign} * G_{ij} + \beta_5 \text{P-Foreign100} * G_{ij} + \varepsilon_{ij} + v_j \qquad (6)$$

Here P-Foreign * $G_{ij}$ represents the interaction between P-Foreign (partially foreign-owned firm) and an institutional variable (either Property, CPI or Polity 2). P-Foreign100 * $G_{ij}$ is the interaction term for 100 per cent foreign-owned firms.

The substantive findings of the paper can be summarised as follows:

- In conformity with previous studies, this study finds that most firms simply do not invest in any given year. Given prevailing levels of uncertainty the irreversibility of investment in fixed capital goods is a strong obstacle to investment.
- With regard to the decision to invest, there is significant relationship between partial foreign ownership and the frequency of investing. There is some - weak - evidence - that fully foreign owned firms invest less frequently.
- More importantly completely foreign-owned firms invest significantly less in fixed capital (in terms of the investment-sales ratio) than domestic firms. Such differences are not found for partially foreign-owned firms. A tentative conclusion would therefore be that limiting the extent of foreign ownership would have a positive influence on the rate of investment, as long as this does not discourage the overall inflow of foreign investment.

There is a caveat that the average negative relationship between complete foreign ownership and the level of investment does not hold for all countries. In a minority of the countries in the sample there is even a positive relationship between foreign equity ownership and investment.

A rather surprising finding of the paper is that macro-economic and institutional factors have relatively little explanatory power with regard to the level of firms' investment. However, they do have a significant impact on the probability that a firm actually invests.

# 5 Institutions, state capacities and development

The previous two papers attempted to analyse some of the specific channels through which institutional characteristics can influence economic performance. The specific channel was investment behaviour and how it responds to the incentives provided by the institutional structure. Now we shift to another interesting channel, namely state capacity and its potential contributions to economic performance. State capacity is analysed in two separate papers. The first paper by Luciana Cingolani, *The State of State Capacity A Review of Concepts, Evidence and Measures* provides an analytic review of the huge literature on state capacity and its consequences. The second paper by Luciana Cingolani, Kaj Thomsson and Denis de Crombrugghe uses empirical measures of state capacity to see whether and how state capacity affects the realisation of the millennium development goals in a sample of countries.

## 5.1 The state of state capacities: a review

No attempt will be made to provide a comprehensive summary of a paper, which itself provides a review, synthesis and summary of a very large body of literature. Rather, we will highlight certain elements and insights derived from the state capacity literature, which are deemed important from the perspective of the wider project on institutions and long-run economic performance. We will also pay attention to measures and indicators of state capacity.

The concept of state capacity emerges from debates about the role of the state in development in the second half of the twentieth century. This debate can be interpreted as a struggle with the Marxist legacy, which viewed the state as part of the superstructure of society, that was completely determined by economic forces and class interests. The state represented the executive committee of the ruling classes and had no autonomy of its own. From classical sociologists such as Max Weber onwards, this determinist perspective on the state was rejected. The state was conceived of as a (relatively) autonomous actor. The formation of stable states came to be seen as an interesting topic for research in its own right and as one of the preconditions for successful economic development. Once the autonomous role of the state was accepted, the quality of state actions and the capacity of the state to pursue developmental goals and implement policies became an interesting topic for research and debate. One the important contributions of the review paper is that it shows that the state is not a monolith. There are many dimensions of state capacities and it is important to unbundle them.

In the classical literature on the state a few recurrent themes surface which continue to play a role in current debates. These themes include the capacity of the state to extract revenue from the population in the face of external or internal challenges. Participation in wars was one of the factors that spurred the need to extract revenue. A second theme is the maintenance of territorial integrity and internal peace in a given territory. This involves a state monopoly on the use of violence. A third major theme is the capacity to implement policies and realise official goals, even in the face of opposition by powerful groups in society. A final theme is

that of bureaucratic capabilities, which include autonomy, professionalisation, recruitment on basis of merit, and internal coordination.

In the modern literature, as reviewed in the paper by Cingolani, one can distinguish two major questions:

1. How do state capacities affect the outcomes of socio-economic development?

2. What are the determinants of state capacities and how could state capacities be improved?

### 5.1.1 State capacity and outcomes

In the literature state capacity has also been linked to a great variety of outcomes. These include:

- growth and economic performance (or the absence thereof)
- innovation
- structural change and industrialisation
- levels of internal violence and criminality
- prevention of civil wars and conflicts
- war contagion
- the implementation of peace agreements
- delivery of public goods
- social protection

The paper pays special attention to three sets of these outcomes: economic growth, industrialisation and conflict.

*State capacity and economic growth,*

The following elements of state capacity are considered to contribute positively to *economic growth*

- bureaucratic professionalisation
- meritocratic recruitment of personnel
- an unpoliticised bureaucracy
- predictable legal systems
- the capacity to enforce property rights (already discussed in the previous sections)
- fiscal capacity, the capacity to raise revenue to public goals and objectives. (It is well-known that many developing countries have underdeveloped fiscal capacities).
- coercive capacity: the capacity of the state to enforce pacification of the territory of the state.
- limitations to the power of the executive through a system of institutional checks and balances.
- limits to corruption

There is an especially interesting tension between coercive capacity and limitations and constraints on the executive and on the state in general. In many developing countries the problem is conceived to be that of 'weak' states which lack the power to tax, regulate and pacify (Acemoglu 2005). But, at the same time institutional limitations to the - arbitrary - powers of the state are seen as a very important element of state capacities.

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*State capacity, structural change and industrialisation.*

A special subset of the literature focuses on the transformative capacity of the state. Can public policy contribute to changes in the structure of the economy, industrialisation, and technological upgrading? This literature is especially - though not exclusively - oriented towards the analysis of catch up in countries such as South Korea, Taiwan and Japan. The key words here are autonomy and embeddedness. The state needs to be sufficiently isolated from political interest groups within and without government in order to pursue long term developmental goals. But it needs to be sufficiently embedded in the economy to interact intensively with productive actors (Evans, 1995). The task of such developmental states is to achieve strategic integration into global trade at terms beneficial to the country. Such developmental states are highly interventionist, but have specific bureaucratic and administrative capabilities that make such interventions possible. In the absence of the required capabilities, interventions will be less effective, or in the worst case of predatory states even detrimental to economic development.

*State capacity and Conflict; fragile states*

As previously discussed, one of the key task of the state apparatus is to maintain internal peace through a monopoly of violence. This is perhaps one of the most basic functions of states. When states do not have the sufficient capabilities, society will descend into civil wars and civil conflicts. The end result will be a fragile or even a failed state, where the capacity to maintain internal pacification has been undermined. Factors conducive to breakdown of internal peace include low financial, organisational and political state capacities, the inability of the state apparatus and the political system to channel social demands in a way that limits to possibilities of rebels. Lack of state capacity reduces chances to resist the spread of regional conflicts. However, it is not so much the coercive capacity of the state that favours internal peace as the existence of an effective bureaucracy.

For the role of the state in controlling violence the work of North, Wallis and Weingast (2009) is of special interest. This literature has already been reviewed in Bluhm and Szirmai (2012), but it also plays a prominent role in the state capacity literature. Control of violence is conceived of as the most fundamental problem faced by human societies. Throughout most of human history such control has been achieved by elite coalitions, who reap rents by limiting access of broad layers of the population to economic and social organisations. Such institutional arrangements are referred to as natural states - or limited access orders. They use these rents to negotiate settlements with other elites to achieve a rather fragile equilibrium. These equilibria are achieved when the distribution of political power is more or less in balance with the distribution of economic rents. The more personalistic the ties between the elites, the more fragile the social order is. Starting from the rule of law for elites, the establishment of a monopoly of violence and consolidated control of the military and the emergence of organisations which outlive the lives of their founders and rules (perpetually lived organisations), limited access orders can been transformed into more stable open access orders. Cingolani reinterprets this transition as a new conceptualisation of the traditional Weberian perspective of bureaucratic professionalisation and the emergence of insulated state

structures that guarantee the stability of public goods beyond personalistic and contingent situations.

### 5.1.2 What are the determinants of state capacities and how can state capacities be improved?

An important strand of the literature emphasises how participation in external conflicts and wars has influenced the emergence and development of state capacities. From this perspective, regions that have experienced more international warfare also tend to have more developed state capacities. In contrast, outbreaks of internal violence tend to weaken state capacity. An interesting insight from this literature is that state capacities both have to be strengthened and have to be constrained. Without limits to executive power and expropriation through democratic institutions and the rule of law, states tend to become predatory and extractive.

From a policy perspective it is perhaps more helpful to focus on the processes, mechanisms and reforms that can improve state capacity. Greatly simplifying, one can see a trade-off between investment in state capabilities which foster long-run growth and development and the sustained provision of public services and short-run investments in the state apparatus as an instrument for holding on to power and extracting rents. There is a permanent temptation to focus on the short-term political future of the incumbents at the expense of long-run investments. The more the bureaucracy is isolated from the political cycle, the greater the chances of improvements in long-run state capacity.

Cutting through the details in the literature over and over again the same elements emerge for improving state capacity. These are much the same elements that have been mentioned in the context of the relationship between state capacity and economic growth:

- Reforms resulting in professionalisation of the bureaucracy.
- Merit oriented administrative reform, meritocratic recruitment and career mechanisms.
- Increased transparency of procedures and reduction of arbitrary personalistic decision making and corruption.
- Establishment of rule of law which makes contracts predictable and places limits to the power of the executive.
- Increasing the ability of government to tax broader segments of the population including the rich and the powerful and thus raise revenue. Broadening the tax base also involves broadening the types of incomes and assets that can be taxed. In many countries with a weak tax base, the two main sources of incomes are taxes on exports and taxes on land.
- Increased efficiency in the provision of public goods.
- Increased ability to implement redistributive policies aimed at reducing extreme social inequalities in order to maintain social harmony.

The key insight emerging from this literature is that state capacity itself is a result of investment decisions by elites. The question is what incentives can be developed for investment in state capacity building.

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### 5.1.3 Measurement of state capacities

The review paper by Cingolani makes clear that state capacity is a multi-dimensional concept. The following seven dimensions need to be taken into account when attempting to measure state capacity.

*Coercive capacity*

The most basic attribute of state capacity is the state's capacity to monopolise coercive power in a given territory. This refers to the military capacity of states to control the territory by discouraging internal conflict and protecting the borders from external invasion.

Measures compiled within the state fragility literature, include the State Failure Index (Polity IV); the State Fragility Index, the Index of State Weakness, the Fragility Index (from Country Indicators for Foreign Policy), the Failed State Index, Failure of Task Force, Forecast of State Failure (Fortin 2010).

*Fiscal capacity*

This dimension emphasises the state's power to extract resources from the society, mainly in the form of tax. Measures of revenue raising are proxies for such capacity. They include measures such as government revenue, or government spending as share of GDP, the distribution of central and local taxes and the nature of the tax system.

*Administrative / Implementation capacity*

The administrative capacity of the state is rooted in the Weberian tradition regarding the modern state and the existence of a professional and insulated bureaucracy. This type of bureaucracy outlives rulers and is deemed essential for the impersonal implementation of laws and policies. In general, it is conceived that implementation capacity develops only after an effective establishment of sovereignty and a stable military control over territory. It requires both skilled officials and financial resources. This dimension of state capacity is perhaps the most widely referred to in the literature, and is closely related to good governance (e.g. Fukuyama 2004, 2013).

*Transformative, industrialisation capacity*

Another strand looks at the state's capacity to intervene in a productive system and shape the economy. From here stems most of the 'developmental state' literature that looks at industrialisation capacity. Some of these works are also loyal to a Weberian approach by contending that a balanced combination of professional cadres in the bureaucracy, proper levels of intra-state agency coordination and a certain degree of state `embeddedness' in the productive structure are the key to transformative capacity. In a similar vein, others look not only to transformative capacity but also distributive and innovative capacity (e.g. Weiss 1998).

*Relational capacity*

The state's relational capacity is perhaps of a broader nature than the other dimensions. It seeks to capture the extent to which the state actually permeates through the society and is able to internalise social interactions within its own actions. Relational capacity looks at

socio-economic engagement, as opposed to the `command-hierarchy' traditional view of the state. For example, the idea of infrastructural power - the capacity to implement decisions throughout the jurisdiction - as something opposed to the despotic power to dictate legislation reflects this dimension of state capacity, perhaps closely related to implementation capacity. The idea of infrastructural capacity has been understood as a) the administrative capabilities of the central state; b) territorial reach; c) the power of the state's `radiating institutions', how the state affects and is limited by civil society. Because of all these interpretations, relational capacity often encompasses several of the other dimensions.

*Legal capacity*

The legal dimension of state capacity has its roots in the `limited government' strand of the literature, in which special attention is given to the limitation of state's intervention. Limitation happens through the existence of a stable legal system that enables credible commitments and contract enforcement (North 1981; Besley and Persson 2007, 2009). In this literature, state capacity is usually captured through the levels of bureaucratic corruption (e.g. Acemoglu and Verdier 1998) or executive checks (Acemoglu 2001).

*Political capacity*

In this dimension, state capacity is equated with political leverage or policymaking capacity. It often refers to the level of power accumulation by elected leaders in order to enforce their policy priorities across the different institutional players (party, Congress, etc.). This literature looks at veto power and executive checks, often sharing insights with the legal capacities literature.

The various empirical measurement instruments and operationalisations are summarised in table 1.

## Table 1: Measures of state capacity

| | | | |
|---|---|---|---|
| Hendrix (2010) (review) | Military personnel per capita. | Correlates of War (CoW), Material Capabilities Dataset | Coercive |
| | Survey assessments on bureaucratic quality. | ICRG-PRS Group. | Bureaucratic / administrative |
| | Risk expropriation measures. | ICRG-PRS Group. | Bureaucratic / administrative |
| | Primary commodity exports. | WDI | Bureaucratic / administrative |
| | Total tax / GDP. | WDI | Fiscal / Extractive |
| | Relative political capacity as the ratio of actual tax revenue to expected tax revenue. | Kugler & Arbetman (1997) | Fiscal / Extractive |
| | Levels of oil production and proven reserves. | BP Statistical Review of World Energy and other sources (Humphreys 2005). | Fiscal / Extractive |
| | Political coherence between democratic and non-democratic features. | Polity 2 | Political capacity |
| | Executive recruitment; electoral participation and constraints to executive authority. | Scalar Index of Polities (SIP) (Gates et. al. 2006). | Political capacity |
| | Political democracy. | Polity 2 | Political capacity |
| Fortin (2010) | Quality of Public Goods Provision consists of a five item index (for Europe): | | |
| | Levels of corruption. | CPI-TI, Heritage Foundation | Bureaucratic / administrative |
| | Quality of property rights protection. | Heritage Foundation | Legal |
| | Taxing capacity: Ratio of tax revenue to GDP. | IMF | Fiscal / Extractive |
| | Progress in infrastructure reform, infrastructure indicators. | EBRD | Infrastructural |
| | Ratio of noncurrency money to total money supply (ratio of currency to money held in banks). | IMF complemented with EIU | Legal |
| Thies (2010) | Total revenue / GDP; total tax/ GDP; relative political capacity. | Johnson and Rabinowitz (2005) | Fiscal / Extractive |
| Buhaug (2010) | Relative political capacity: actual tax revenue / expected tax revenue. | Kugler and Arbetman (1997) | Fiscal / Extractive |
| Kocher (2010) | Power of the army. | | Coercive |
| | Professional bureaucracy. | There are empirical proposals only. | Administrative |
| | Wealth and taxing capacity. | | Fiscal / Extractive |
| | Road networks. | | Infrastructural |
| | Constraints on the regime. | | Political capacity |
| Hamm and King (2010) | Due to the lack of data on state capacity in post-communist countries, the authors use countries' homicide rates as a proxy for state capacity. | WHO | Generic |
| Cardenas (2010) | GDP share of total revenue. | Baunsgaard and Keen (2010) | Fiscal capacity |
| | GDP share of income tax revenues. | from GFS and IMF country | Fiscal capacity |
| | Total tax share of domestic tax revenue. | documents. | Fiscal capacity |
| | Index of "outright confiscation and forced natinalization". | ICRG-PRS Group | Bureaucratic / administrative |
| | Ease of doing business. | Doing Business | Bureaucratic / administrative |
| | Government effectiveness. | WGI | Bureaucratic / administrative |
| | Columbia State Capacity Survey question 21. | Columbia University | Bureaucratic / administrative |
| | State Capabilities measure. | IADB (Berkman et. Al. 2008). | Bureaucratic / administrative |

| Authors | Measurements of state capacity | Source | Dimension of state capacity emphazised |
|---|---|---|---|
| Geddes (1996) | Appointment Strategy Index: a composite indicator measuring wheather the criteria for executive appointments is partisan or competence-based. Also, state capacity is approximated by the number of administrative reforms. | Author's elaboration. | Bureaucratic / administrative |
| Evans and Rauch (1999) | 'Weberianness' of the state: Weberian State Dataset, measuring meritocratic recruitment, salary arrangements and career paths. | Authors' elaboration: Weberianess Survey (UCSD) | Bureaucratic / administrative |
| Acemoglu, Johnson and Robinson (2001); | Constraints on the executive: Survey assessment on risk of expropriation and repudiation of government contracts. | ICRG-PRS Group. | Legal |
| Centeno (2002) | Date of first national census. | Goyer et. Al. (1983) | Infrastructural / generic |
|  | Railroad density in 1900. | Mitchell (1983) | Infrastructural / generic |
| Bockstette, Chanda and Puttermann (2002) | Statehist5: index of state antiquity. | Authors' elaboration. | Generic |
| Fearon and Laitin (2003) | Log of GDP per capita. |  | Generic |
| Bäck and Hadenius (2008) | Bureucractic Quality and Control of Corruption. | ICRG-PRS Group. | Bureaucratic / administrative |
| Soifer (2008) | National capabilities regarding national revenue and expenditures in Western Europe. | E.g.: Mann (1993) and Straus (2006) | Bureaucratic / administrative |
|  | Territorial variation in the ability of the state to compel compliance. | E.g.: Kalyvas (2006), Goodwin (2001) and Soifer (2006). | Territorial control |
|  | Effects of state policy on social identity. | E.g.: Weber (1976) and Vaughan (1997). | Relational capacity |
| Besley and Persson (2008) | Tax collection as share of GDP. | Baunsgaard and Keen (2005) | Fiscal / Extractive |
|  | Income tax as share of total tax. | | Fiscal / Extractive |
|  | Average inflation rate. | | Fiscal / Extractive |
| Besley and Persson (2009) | Private credit to GDP ratio. | King and Levine (1993) | Legal |
|  | Access to credit (rank). | Doing Business | Legal |
|  | Investor protection (rank). | | Legal |
|  | Index of government anti-diversion policies (sum of five different indicators). | ICRG-PRS Group. | Legal |
|  | One minus the share of trade taxes in total taxes. | IMF / WDI | Fiscal / Extractive |
|  | One minus the share of trade and indirect taxes in total taxes. | | Fiscal / Extractive |
|  | Share of income taxes in GDP. | | Fiscal / Extractive |
|  | Share of taxes in GDP. | | Fiscal / Extractive |

## 5.2 State capacities, bureaucratic autonomy and the millennium development goals

The paper on *state capacity, bureaucratic autonomy and millennium development goals* by Luciana Cingolani, Kaj Thommson and Denis de Crombrugghe provides an empirical application of the studies reviewed in the previous paper and the previous section. It focuses specifically on one of the key element of state capacity, namely autonomy of the bureaucracy.[5]

Empirical measures of bureaucratic autonomy are scarce. As a proxy for wider levels of bureaucratic autonomy, the authors propose to focus on the autonomy of central banks, for which data can be found. They develop the following de facto measure of bureaucratic autonomy of central banks, based on the nature of appointments of central governors. They

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[5] This paper also contains a further review of the literature. The review of the previous section is actually based on both papers. Here we will focus on the substantive findings of the second paper. Elements of the literature review have been incorporated in the previous section.

contrast regular replacement of central bank governors with irregular replacement based on political meddling or intervention.

$$AUTit = \frac{\sum_{t=1}^{T} RegTORit - \sum_{t=1}^{T} IrregTORit}{1 + \sum_{t=1}^{T} RegTORit + IrregTORit} \tag{7}$$

In this equation *RegTor* represents regular turnovers of central bank governors and *IrregTOR* represents irregular turnovers. Data are available for the frequency of regular and irregular turnovers in 88 countries over the period 1970-2011. The index has a rather straightforward interpretation: negative measures represent that most of the turnovers have been irregular and positives represent the opposite. More occurrences of regular turnovers are interpreted as a indication of more autonomy for the central banking agency.

The authors start their analysis by describing the correlations between their measure of bureaucratic autonomy and other indictors of state capacity based on commonly available datasets. In doing so, they divide their observations into three subsets: those for democracies, those for autocracies and for an in-between category denoted as anocracies. A country in a given year is defined as an autocracy if the index Polity2 from the database Polity IV is less than -5; anocracies are between -5 and 5 and democracies are those above 5 (Marshall, Jaggers and Gurr, 2010).

The correlations between autonomy and other measures of state capacity are reproduced in the table 2. In this table most of the variables measuring state capacity are negatively correlated with bureaucratic autonomy within the sub-sample of autocracies. There is a positive and significant relationship in democracies. No clear pattern emerges for anocracies. The authors tentatively conclude that bureaucratic autonomy and state capacity tend to converge in the context of consolidated democracies. However, they significantly differ in anocracies and autocracies. In these types of polities, state capacity, if any, arises from sources other than bureaucratic autonomy. But, the authors warn that the indicator of autonomy may only capture the level of autonomy of the whole bureaucracy in democratic settings. The search for more sophisticated measures of bureaucratic autonomy is one of the obvious avenues for future research.

**Correlations between bureaucratic autonomy and other measures of state capacity**

| Dimension | State Capacity measure | Autocracies | Anocracies | Democracies |
|---|---|---|---|---|
| Administrative | Bureaucratic Quality (ICRG) | 0.1466** | 0.1234*** | 0.2207*** |
| | Control of corruption (ICRG) | 0.0856* | 0.1500*** | 0.1706*** |
| | Control of corruption (HF) | -0.1564** | 0.0819 | 0.1117*** |
| | CPI (TI) | -0.0685 | 0.1329* | 0.1392*** |
| Legal | Property rights (HF) | -0.0526 | 0.2024*** | 0.0623* |
| | Rule of Law (WB) | -0.4110*** | 0.0232 | 0.0591* |
| | Contract intensive money (WDI) | -0.3026*** | 0.0385 | -0.0207 |
| Fiscal | Government Revenue (WDI) | 0.0490 | -0.0989 | 0.1001*** |
| | Income Tax (% total taxes - WDI) | -0.3433*** | 0.1330** | 0.1035*** |
| | Income Tax (% of revenue- WDI) | -0.1950** | 0.1643*** | 0.1265*** |
| | 1- Trade tax | -0.5006*** | -0.0392 | -0.0656* |
| | 1- (Trade tax + Inc tax) | -0.1417* | -0.1501** | -0.2350* |
| | Inc tax * Gov revenue | -0.1350* | 0.0029 | 0.1325* |
| | Tax rev | 0.2670*** | -0.0544 | 0.0952*** |
| | Primary commodity exports (R*) | 0.1096*** | 0.1489*** | -0.0584*** |
| | Tax from exports | 0.3356*** | 0.1180 | -0.0527 |
| Coercive | Military Personnel (COW) | -0.1975*** | -0.1653*** | -0.0723*** |
| | Log of Military Expend (COW) | -0.3537*** | -0.3064*** | 0.1046*** |
| | State Fragility (Pol4) | -0.2776*** | 0.0871 | -0.0350 |
| Others | Inflation (WDI) (R*) | 0.0099 | -0.0336 | -0.0417** |
| | Road Density (WDI) | -0.1634 | 0.5408*** | -0.0207 |
| | Military in Politics (ICRG) | -0.0751 | 0.3176*** | 0.1074*** |
| | Log GDP/c | -0.385*** | -0.0117 | 0.1039* |

Note: R* is a reversed scale, meaning that higher values of the variable represent
less capacity.

In the final section of the paper, the authors take the creative step of linking indicators of state capacity to the successful realisation of the millennium development goals. The expectation is that countries that score high on various measures of state capacity will achieve more success in reaching the MDGs. Two of the MDG indicators are selected for the analysis, namely changes in child mortality and changes in tuberculosis incidence rates.

The explanatory variables include operationalisations of different dimensions of state capacity:

- Yearly differences in the proxy for bureaucratic autonomy (discussed above).
- Yearly changes in tax revenue as share of GDP (from IMF sources)
- A dichotomous variable for democracy: score 1 meaning that countries score higher than 5 in the polity IV scale, and 0 otherwise.
- Per capita GDP levels and GDP growth (from the Maddison database).
- Annual population growth (WDI).
- Changes in government expenditures on health (IMF)
- Changes in government expenditures on education (IMF)
- Changes in social protection expenditure as share of GDP (IMF).

Regressions are run on a dataset for the years 1990-2008. The results of the regressions for child mortality show that democracy and higher expenditures on education are the most robust determinants of yearly reductions in child mortality. In the most complete specification, which includes all the variables above, as well as lagged values for changes in expenditures and GDP growth, the indicator for bureaucratic autonomy has a significant effect. Most of the other indicators have non-significant coefficients. With regard to changes in TBC incidence, the authors again find significant effects of bureaucratic autonomy and education expenditures.

The authors stress that these results are preliminary ones and that further research is needed. Better and more comprehensive measures of bureaucratic autonomy and more tailored measures of state capacity need to be developed. But in spite of these limitations, the authors conclude that the results show a preliminary pattern pointing to the importance of institutions like democracy and bureaucratic autonomy for short-term improvements in basic welfare standards.

# 6 Does growth contribute to poverty reduction? Do institutions and inequality matter?

The paper on poverty reduction – *The Pace of Poverty Reduction: A fractional response approach* – by Richard Bluhm, Denis de Crombrugghe and Adam Szirmai revisits one of the central questions of economic development, namely the relative contributions of economic growth and changes in income inequality to poverty reduction.

The role of institutions in the analysis shifted in important ways as the research for this paper evolved. Initially, one of the aims of the paper was to examine how institutional characteristics could affect the ways in which poverty (measured by the poverty headcount ratio, the percentage of the population below a given poverty line) responded to changes in income inequality and changes in income per capita (economic growth). The authors assumed that certain institutional characteristics – e.g. the pattern of land ownership, or institutions governing access to productive assets – would influence the poverty elasticities of growth and inequality. As the project progressed it became clear that if the decomposition equation was correctly specified, changes in poverty could be completely attributed to changes in income per capita and changes in income inequality. There was no place for institutions at this level of the analysis.

This does not mean, however, that institutional characteristics are unimportant for poverty reduction. First of all, one could argue that the degree of inequality itself is an important proxy of institutional characteristics. Thus in publications of Acemoglu and his co-authors (e.g. Acemoglu and Robinson, 2012) inclusive institutions are contrasted with extractive institutions. In the tradition of North, Wallis and Weingast (2009) open access to economic and political organisations is contrasted with limited access. In the work of Engerman and Sokoloff (2002) institutions create and maintain more or less equal distributions of wealth, human capital and access to economic and political opportunities (for a review see Bluhm and Szirmai 2012). It is clear that institutional characteristics such as inclusiveness and open access are closely related to income inequality and the nature of the income distribution.

Next, if one makes an analytical distinction between income inequality and underlying institutions, institutional characteristics enter the quantitative analysis as important determinants of changes in inequality as well as rates of economic growth. With regard to economic growth, evidence of the importance of institutions has been presented in several of the papers of this project. For instance in the two papers by Bluhm, de Crombrugghe and Szirmai (2012, 2013a) the authors have shown that institutional characteristics can help explain the occurrence of economic crises and the duration of slumps. Bhupatiraju and Verspagen (2013) have shown that institutions are a determinant of economic performance. Thus we may conclude that institutional characteristics are important ultimate determinants, of poverty and poverty reduction but that they operate indirectly via growth and changes in inequality, rather than directly.

The contributions of the paper are threefold: First, it makes the important methodological point that poverty decompositions should take the bounded nature of the most important poverty indicator, the poverty headcount ratio, into account. Second, using a new – so-called fractional response approach – the paper provides estimates of the income and inequality elasticities of poverty for both the two dollar a day and the one dollar a day poverty lines. Third, on this basis of this improved methodology, the paper presents poverty projections from 2010 until 2030.

*Methodological contributions*

In the empirical analysis of poverty changes, the most frequently used measure is the poverty headcount ratio – the fraction of the total population below a given poverty line. The headcount ratio is bounded; it varies only between zero and one. However, linear estimations of poverty changes do not account for this boundedness, resulting in poorly fitting approximations of the underlying decomposition identity. In addition, the relationship between income and poverty, or inequality and poverty, is known to be highly non-linear. Poverty elasticities are not constant but vary substantially with the initial levels of inequality and income per capita.

The paper applies fractional response models (see Papke and Wooldridge 1996, 2008; Wooldridge 2010) to poverty reduction. It presents extensions of such models dealing with unobserved heterogeneity, measurement error and the unbalanced character of the panel data. The result is a greatly improved accuracy of the poverty decomposition that fully captures the

non-linearity of the poverty-inequality-growth nexus (for technical details the reader is referred to the original paper).

A second important contribution is the paper's emphasis on semi-elasticities as the most policy-relevant quantity for assessing the poverty reduction potential of particular country (or region). In the case of elasticities, *relative* differences in the headcount ratio are related to *relative* differences in incomes and *relative* changes in inequality. This can be extremely misleading. In richer countries with very low levels of absolute poverty, small absolute changes in the poverty headcount will result in very large relative reductions of poverty. Elasticities will thus (automatically) give the impression that richer countries are better at poverty reduction. It is more revealing to use semi-elasticities, where the key concept is the percentage point change in the poverty headcount (e.g. a headcount of 10% in 2010 compared to a headcount of 5% in 2009 is a 5 percentage point decrease). Semi-elasticities approach zero as countries become richer. While this paper is not the first to point to the importance of semi-elasticities (see e.g. Klasen and Misselhorn, 2008), estimating semi-elasticities with fractional response models provides new insights into global poverty dynamics.

A third methodological contribution is that this paper addresses important limitations of international poverty statistics. It corrects the estimated elasticities and semi-elasticities for time-persistent measurement differences between different types of surveys and time-varying measurement errors in income. Not accounting for measurement errors in average incomes would lead downward biased estimates of the income (semi-)elasticity of poverty. In addition, the paper accounts for the irregular spacing of poverty data due to the limited availability of household surveys in developing countries.

*Data*

The dataset for this paper derives from the World Bank *PovcalNet* database, which provides a set of 809 national representative surveys of income or consumption covering 124 countries from 1981 to 2010.

The paper tackles two important data problems. First, the dataset is a mix of household surveys of income and household surveys of consumption expenditures. For linear models, log differences are observations that are based on differences between two compatible types of surveys for the same country, which are subsequently converted to an annual basis. This results in a smaller dataset of 648 observations in 104 countries, as differencing requires the combination of original data points. In the fractional response models, the authors simply add dummy variables indicating the type of survey (income versus consumption, grouped or household-level data), which proxies for structural differences among surveys. In addition, some countries only report separate urban and rural household surveys. The authors weight the poverty and income data using urban/rural population shares to construct nationally representative series (a special adjustment is used for the Gini coefficient, see the paper).

In some regressions per capita consumption data from the national accounts are used as instrumental variables for average income to account for time-varying measurement errors in income obtained from the household surveys.

*Findings*

As such the findings with regard to *average* elasticities are consistent with those in the previous literature (e.g. Adams, 2004; Bourguignon, 2003; Kalwij and Verschoor, 2007; Klasen and Misselhorn, 2008) – though somewhat at the lower end –, but the fit of the models is much better.  In terms of a simple R-squared measure, the correlation between observed and fitted values is near perfect (>.99). In the preferred specification of the authors, a one percent increase in per capita income (holding inequality constant) on average results in a 0.339 percentage point reduction of poverty (at the 2$ a day poverty line). A one percent decline in the Gini coefficient of income inequality results in a 0.251 percentage point reduction in poverty (see Bluhm et al. 2013, table 2, specification 3).

One of the strengths of the fractional response approach lies in its ability to deliver more precise estimates of elasticities *other than the overall average*. Tables 3 and 4 provide regional elasticities. As elasticities depend on initial levels of income and inequality, the regional differences are themselves mainly due to differences in income levels and differences in initial degrees of inequality. Table 3 shows the estimated regional income elasticities, table 4 the regional inequality elasticities.

**Table 3 Predicted regional income elasticities, preferred specification, 2$ a day**

|  | **1981-89** | **1990-94** | **1995-99** | **2000-04** | **2005-10** |
|---|---|---|---|---|---|
| **East Asia and the Pacific** | -0.991 | -1.029 | -1.237 | -1.139 | -1.578 |
|  | (-0.03) | (-0.033) | (-0.0550) | (-0.043) | (-0.101) |
| **Eastern Europe and Central Asia** | -4.358 | -2.892 | -2.700 | -2.846 | -3.304 |
|  | (-0.555) | (-0.309) | (-0.277) | (-0.304) | (-0.384) |
| **Latin American and Caribbean** | -2.284 | -2.374 | -2.425 | -2.349 | -2.985 |
|  | (-0.243) | (-0.257) | (-0.271) | (-0.258) | (-0.366) |
| **Middle East and North Africa** | -2.176 | -2.116 | -2.024 | -1.966 | -2.501 |
|  | (-0.203) | (-0.188) | (-0.168) | (-0.161) | (-0.246) |
| **South Asia** | -0.548 | -0.629 | -0.81 | -1.024 | -1.192 |
|  | (-0.053) | (-0.048) | (-0.03) | (-0.032) | (-0.046) |
| **Sub-Saharan Africa** | -0.831 | -0.437 | -0.436 | -0.592 | -0.632 |
|  | (-0.027) | (-0.039) | (-0.04) | (-0.035) | (-0.033) |

More affluent regions (Eastern Europe and Central Asia, Latin America and the Caribbean, and the Middle East and North Africa) have higher income elasticities than poorer regions (East Asia and Pacific, South Asia and Sub- Saharan Africa). Income dynamics over time are also clearly visible. In Eastern Europe and Central Asia, for example, income is comparatively high before the post-communist transition, sharply collapses throughout the 1990s and then recovers during the 2000s.

**Table 4: Predicted regional Gini elasticities, preferred specification, 2$ a day**

|  | 1981-89 | 1990-94 | 1995-99 | 2000-04 | 2005-10 |
|---|---|---|---|---|---|
| **East Asia and the Pacific** | 0.732 | 0.76 | 0.914 | 0.841 | 1.165 |
|  | (-0.105) | (-0.101) | (-0.113) | (-0.108) | (-0.144) |
| **Eastern Europe and Central Asia** | 3.219 | 2.136 | 1.994 | 2.102 | 2.44 |
|  | (-0.51) | (-0.307) | (-0.283) | (-0.296) | (-0.353) |
| **Latin American and Caribbean** | 1.687 | 1.753 | 1.791 | 1.735 | 2.205 |
|  | (-0.186) | (-0.198) | (-0.199) | (-0.189) | (-0.269) |
| **Middle East and North Africa** | 1.607 | 1.563 | 1.495 | 1.452 | 1.847 |
|  | (-0.197) | (-0.198) | (-0.196) | (-0.185) | (-0.253) |
| **South Asia** | 0.405 | 0.464 | 0.598 | 0.756 | 0.88 |
|  | (-0.093) | (-0.097) | (-0.095) | (-0.107) | (-0.127) |
| **Sub-Saharan Africa** | 0.614 | 0.322 | 0.322 | 0.437 | 0.467 |
|  | (-0.087) | (-0.055) | (-0.06) | (-0.066) | (-0.069) |

The region- and time-specific Gini elasticities in Table 4 show where the potential for proportionate reductions in the poverty headcount through redistributive policies was greatest over the last three decades. Unsurprisingly, these regions were Eastern Europe and Central Asia, Latin America and the Caribbean, and the Middle East and North Africa (all of which have above average inequality). Sub-Saharan Africa started out with high inequality in the 1980s but incomes were very low relative to the poverty line, so that the Gini elasticity was small.

*Double dividend*

Combining semi-elasticities of Gini and income in a single graph illustrates the large double poverty dividend that can be reaped through combined growth and redistribution. In short, the more equal a society, the greater the potential for poverty reduction through growth.

Figure 7 shows the predicted response of poverty to shifts in income and inequality (Gini). On the horizontal axis one finds average income as a fraction of the poverty line ($\bar{y}_t/z$). In the upper panel, the vertical axis shows the estimated elasticities (the relative response of poverty to changes in income or inequality), in the lower panel it shows semi-elasticities. For the reader it is important to note that an elasticity of zero implies no reduction in poverty and large negative values denote strong reductions in poverty. The Gini elasticities are positive as they measure the response of poverty to increasing inequality.

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**Figure 7**
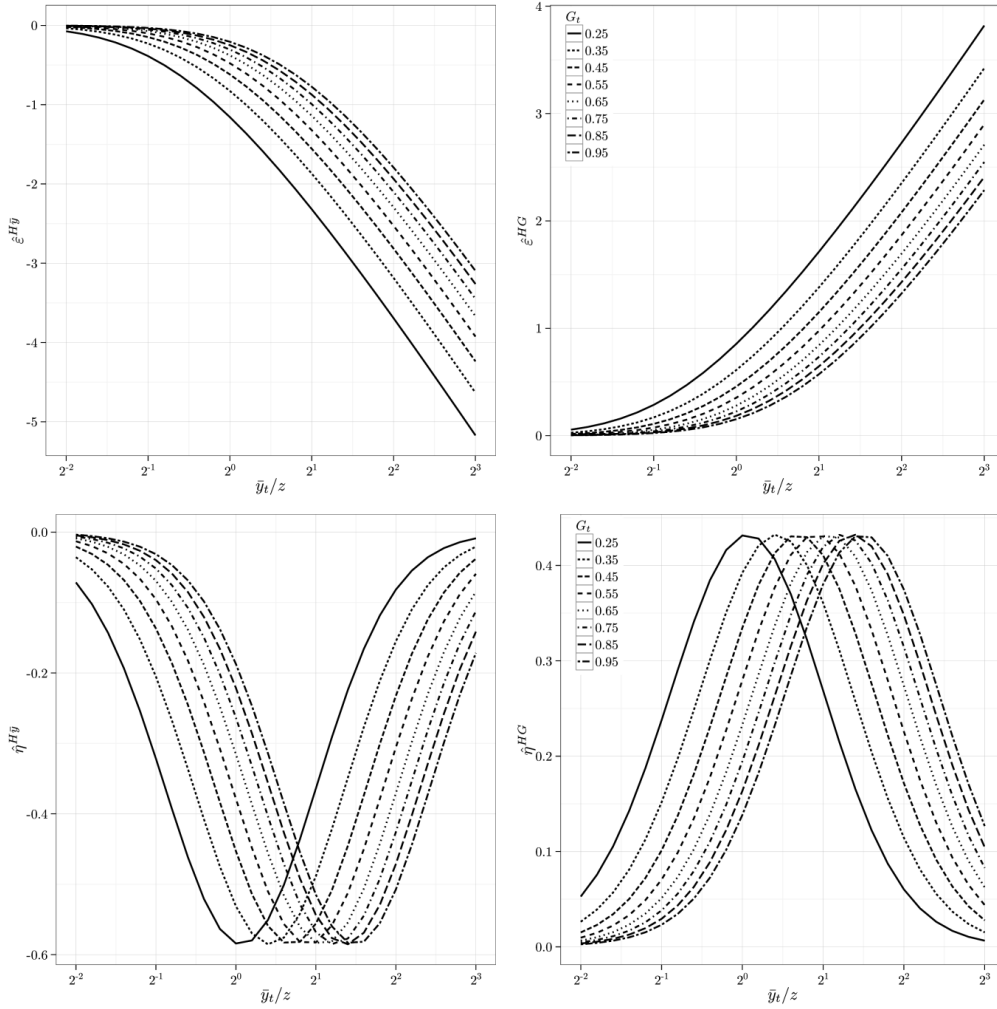


The pictures are very intuitive. The top-left panel shows that the income elasticity of poverty is systematically higher, if the initial level of inequality is lower. Countries profit more from growth if they start with more equal distributions. The top-right panel shows that the elasticity of inequality is also affected by higher initial equality.

The bottom panel plots the predicted semi-elasticities. If the income shortfall is very large (with average income $\bar{y}_t$ far below the poverty line $z$) the mass of the income distribution is far below the poverty line. As a result, both the income and the Gini semi-elasticities approach zero. In a very poor country, it is difficult to lift people above the poverty line.

However, if the country is very rich – the mass of the income distribution is far above the poverty line. In this case both semi-elasticities also approach zero. In a rich country with most people above the poverty line, further increases in income or declines in poverty will not make much of a difference.

Between those two extremes, improvements in the income distribution can make a very large difference in terms of percent of the population lifted out of poverty, both, directly through redistribution and indirectly through growth. If average income equals the poverty line

$(\bar{y}_t/z = 1)$, for example, a Gini of 0.25 implies that one percent income growth leads to a 0.584 percentage point reduction in the poverty headcount – that is, about 0.6% percent of the entire population are lifted out of poverty. Conversely, a Gini of 0.55 implies that one percent income growth leads to a 0.378 percentage point reduction in the poverty headcount.

Especially at low average income levels the initial income distribution is decisive. It practically determines whether there is any substantial potential for poverty alleviation through income growth at all (in terms of percent of the population that is poor). Moreover, as the Gini semi-elasticity also depends on the level of inequality, further improvements in the income distribution will have a larger effect on poverty reduction at lower levels of inequality. This suggests that poverty reduction strategies should focus both on income growth and equalisation, especially in least developed countries and high inequality countries where the total returns to redistribution are large.

*Projecting poverty*

The model developed in this paper can be used to project poverty rates in to the future (after making assumptions about rates of growth and changes in inequality). The paper illustrates the potential for such projections till 2030 using two very simple assumptions, namely that a country's future growth rate of per capita consumption will be equal to the average growth rate between 1995 and 2010, and that there will be no significant changes in income inequality. The projections are made for the two dollar a day poverty line. Even this very simple extrapolation provides us with some very interesting insights.

**Figure 8: Poverty Projections**
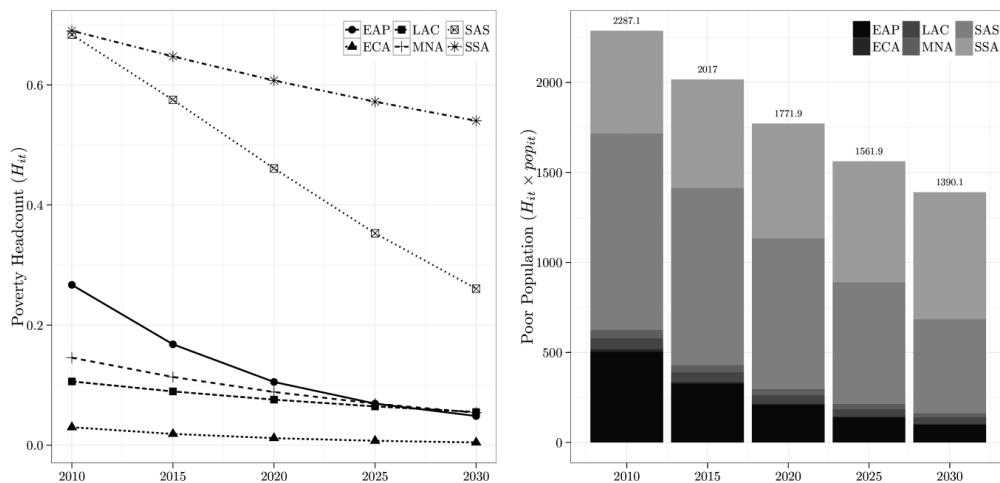
Given past growth trajectories, poverty in Sub-Saharan Africa and South Asia remains the fundamental development challenge of the twenty first century. At the 2$a day line, estimated poverty in Sub-Saharan Africa is very high in 2010 (69.02%) and projected to remain high through 2030 (54.02%) on the entire subcontinent in spite of sustained income growth (about 2.3% p.a.). In South Asia poverty is equally high in 2010 (68.36%), but projected to fall by

more than half (to 26.06% in 2030). By 2030, about half of the world's poor will live in Sub-Saharan Africa, followed closely by South Asia. Poverty in the East Asia and Pacific region, on the contrary, largely takes care of itself if incomes and consumption expenditures keep growing at the impressive rates of the last 15 years.

Poverty in East Asia (4.86%) is projected to be less than in Latin America (5.52%) by 2030, and second only to Eastern Europe and Central Asia where absolute poverty virtually disappears (down to 0.46%). Most of the progress in East Asia is due to rapid income and expenditure growth in China. Progress in Latin America and the Caribbean, and the Middle East and North Africa is noticeably slower in spite of the assumption of robust yet moderate income growth and comparatively large income elasticities. Progress in Latin American and the Middle East North Africa is slower.

It is clear that these projections depend on the assumptions concerning growth and inequality. It would be possible to develop a whole range of scenarios, but that is a topic for subsequent research.


*Concluding remarks*

The focus of the paper is on estimating the income and inequality (semi-)elasticities of poverty. But the elasticities can also be combined with actual changes in income and inequality to get the contribution of income growth or inequality to overall poverty reduction (i.e. how much of a given change in poverty is due to economic growth and how much is due to changes in inequality).

The panel dataset  used in the paper indicates that while there is substantial variation in inequality, it shows no systematic average trend over the period from 1981 to 2010.[6] In contrast, incomes and expenditures have increased substantially in all regions over the same time span. At first sight, one might therefore be tempted to conclude that it is growth that drives most of poverty reduction (c.f. Dollar and Kraaij, 2002, 2004), but this conclusion is not warranted for two reasons. First, decompositions should not be done on basis of the average changes, but on changes in specific countries. There will be countries which combine growth with declining inequality, growth with increasing inequality, stagnation with increasing inequality and so forth. This is another exciting avenue for further research.

A second important insight is that the (semi-)elasticities of growth and inequality depend very much on the initial levels of inequality and per capita income. Thus, in a country with a more equal initial distribution of income, a given increase in per capita reduction will result in much more poverty reduction than in a country with an unequal distribution of income. Also, the potential for poverty reduction depends very much on the average level of income. If the level of income is such that many people are bunched close to a poverty line, the

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[6] In some countries there are increases in inequality, in others declines or no changes. In the dataset, there is hardly any relationship between growth rates and changes in the Gini coefficient (see Bluhm et al. 2013, figure B-4). This runs counter to the widespread assumption that rapid growth is associated with rapid increases in inequality. This is clearly one of the avenues for further investigation.

poverty elasticities will be much greater than if large numbers of the population are far below or far above the poverty line.

The analysis of the pace of poverty reduction provides a reaffirmation of an old insight from the growth with redistribution literature in the 1970s (Chenery et al. 1974), namely that there is a very large double dividend for developing countries that succeed in combining rapid growth with redistribution. Hence, the paper concludes as follows (Bluhm et al. 2013, p. 24): "It is tempting to interpret our findings as evidence of the primacy of growth. Yet, we are by no means arguing that income growth is all that matters for poverty reduction. It is important to emphasise that the causal effect of any particular policy on aggregate household income and the relative distribution of income cannot be discerned from a decomposition exercise such as this. What it does is help to identify how a given change in average income or in distribution translates into poverty outcomes, and not how that change is brought about. Hence, the importance of institutions, trade and a host of other factors for poverty alleviation remains undiminished. There is a potentially large 'double dividend' to be reaped if growth can be achieved in combination with simultaneous reductions in inequality."

# 7 Some reflections on further research

This paper provides a rough summary and synthesis of the papers of the second phase of the AFD/ MGSoG research project on institutions and long run economic performance. In this concluding paragraph, we provide some reflections concerning possible avenues for future research, both substantive and with regard to the future of the IPD database. These should not be seen as 'recommendations' but rather as food for thought and debate.

## 7.1 Creating panel datasets of institutional indicators

Good time series for institutional indicators are still scarce. One of the priorities for the Institutional Profile Database is to create a usable panel version of the dataset, with questions that are repeated in successive waves. As the questions of the questionnaire and the coding categories have changed over time since 2001 this is a far from easy task. Some attempts have already been made to create panel versions of the dataset (e.g. Cingolani and de Crombrugghe 2012) but further attempts in this direction using a limited subset of questions common to several waves of the survey would be welcome.

## 7.2 Comparisons of countries in time and space

The usefulness of the IPD database will be enhanced if the presentation of the data allows for easy comparisons between countries in time and space for selected indicators. This is one of the strong points of datasets such as the World Governance Indicators and the Country Policy and Institutional Assessments.

## 7.3 Exploiting the richness of the IPD data

On the one hand IPD data need to be presented in a standardised format, which is accessible to both researchers and policy makers. This inevitably involves data reduction and aggregation. However one of the characteristics of IPD is the richness of the underlying

database, which is available online to be exploited by researchers. Using selected items from the questionnaire, researchers could develop clear conceptual indicators for selected aspects of the institutional structure, such as state capacity, land ownership, family institutions, educational institutions and so forth. The seventeen papers written in the context of this project provide pointers for such work.

One of the problems of the present database is that so many of the items turn out to be highly correlated with one or two basic dimensions if one applies factor analytic techniques. Perhaps the use of carefully selected small subsets of the data focusing on specific well-defined concepts provides one possible way forward.

## 7.4  Analytic country studies and cross-country quantitative analysis

There is scope for fruitful combinations of analytic country studies and cross-country quantitative analysis. Country studies can provide a rich and context specific analysis of institutions and institutional change, which tends to get lost in the comparative statistical analysis. Cross country statistical studies develop hypotheses and theories which can be examined in a country study context. The statistical analysis also serves as a check on single country studies.

## 7.5  Dynamic analysis of institutions and institutional change

There is a need for more dynamic analysis of institutions. A large part of the quantitative literature focuses on institutions in a rather static sense. Questions that are asked include whether institutions are more important than geography or openness, or whether expropriation risk does or does not explain investment and growth. It is an illusion to think that such questions can be answered irrespective of time and place. For instance, the role of geography was obviously more important in pre-modern times, when transport costs where overwhelmingly important and communication possibilities were limited (e.g. Williamson, 2011). Instead of taking institutions as static and unchanging variables which compete with other ultimate factors in explaining development, one should interpret institutions as evolving and co-evolving together with other dimensions of economy and society. This would help us to develop theories of institutional change and hopefully also theories about the kind of national or international policy interventions that generate successful processes of change and reform.

The current financial crisis in the advanced economies highlights the need for a dynamic analysis of institutions. In the past variables such as financial depth, financial intermediation, financial openness, stock markets and financial innovation were seen as key elements contributing to economic growth and development. Emerging economies were urged to emulate the financial institutions of the advanced economies. Now it seems that the financial institutions that have developed in the advanced economies have become dysfunctional and destructive, causing crisis in the advanced economies and posing huge risks to the world economy. Thus dynamic institutional analysis has to take into account that institutions change over time and that the same kind of institutions may function differently as conditions change. It is this kind of changes which are hard to capture in econometric analysis with static institutional indicators. Institutions which may have been contributors to growth in the

past may become obstacles at later stages of development. An indication of the dynamic relationships between institutions and economic shocks is provided in the paper of Bluhm et al. 2013 on economic slumps. These authors argue that slumps may offer windows of opportunity for institutional improvements.

## 7.6 Spatial dimensions

The papers by Bhupatiraju and Verspagen have highlighted the importance of spatial dimensions of institutions as a fruitful area for further research. Countries do not exist in isolation but are also influenced by the institutional characteristics of neighbouring countries and regions.

## 7.7 Proximate factors: investment, savings, innovation, education

The papers by Farla and al. have shown how institutions can influence important proximate sources of growth such as investment, the relationships between FDI and domestic investment and intermediate factors such as industrial policy. But the results are still preliminary and often somewhat inconclusive. More needs to be done to derive policy relevant conclusions about how the volume of investment can be increased and the contributions of FDI optimised through an appropriate mix of policies and institutional reforms. Unscrambling the interactions between institutional reform and investment behaviour is a challenging and interesting avenue for future research. A better understanding of how institutional and policy reforms influence rent seeking behaviours of different types of investors is of considerable policy relevance.

Next, similar research projects can be developed concerning the influence of institutional characteristics on other proximate sources of economic growth such as savings rates, innovative performance or investment in human capital.

## 7.8 Growth episodes

The study of different types of growth episodes turns out to be a very fruitful avenue for research, which clearly highlights the importance of institutional factors. The kind of analysis applied to the onset of crises and the duration of declines in the papers of this project could be applied to many different types of growth episodes. An exciting challenge is to show how successive growth episodes and their characteristics add up to longer patterns of growth, catch up, stagnation or falling behind. Once we start to understand the nature of growth episodes and the factors explaining them, we may be better placed to tackle long-run differences in growth performance.

## 7.9 State capacities

The two papers on state capacities have illustrated the importance of state capacity and have indicated that this is an exciting area for further research. In particular, it could be a challenge to define and operationalise the characteristics of developmental states that can play a role in accelerated growth and catch up. For this we need to develop better and more precise measures of concepts such as bureaucratic autonomy, the meritocratic nature of the bureaucracy, implementation capacity and limits to the power of the executive. Another topic

that merits further research is that of capacity building. Can empirical research provide us with lessons and guidelines for improving different state capacities?

## 7.10 Growth, inequality and poverty reduction

Further analysis of the role of growth and changes in inequality in poverty reduction is another promising avenue for further research. By now we can be fairly confident about the coefficients which measure the poverty elasticity of growth and inequality. This would allow us to develop a wide range of scenarios with different combinations of growth and inequality. This is one of the interesting avenues for future research.

Next, more can be done in modeling the interactions between growth and inequality in the real world. To what extent are growth accelerations in catch-up economies accompanied by increasing income disparities? To what extent do excessive redistributive policies at early stages of development dampen the speed of growth? Can we identify developmental paths with feasible combinations of accelerated growth and declining inequality?

Further examination of the country specific paths with regard to inequality and growth will allow us to give quite specific decompositions of how much of poverty reduction is driven by growth and how much by spontaneous and/or policy driven changes in income inequality.

Finally, we have concluded from the research in this project that institutions do not affect the elasticity of poverty reduction directly. Changes in poverty can be accounted for by the two key variables, growth and inequality. But, what the research in this project has clearly shown is that growth itself is influenced by institutional characteristics and that the degree of income inequality reflects deeper levels of institutionalised inequality in societies. Thus in future research, we could develop more comprehensive models taking growth and inequality as the proximate determinants of poverty reduction and adding policies, institutions, geography and other intermediate and ultimate factors that affect growth and inequality into the analysis.

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