Democratic Institutions and Prosperity
A Bundled Approach

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Even though it has been part of scholarly discourse for decades, theoretical and empirical evidence on the relationship between democratic institutions and economic prosperity remains ambiguous. The present study adds to this discussion by introducing a bundled approach for measuring institutions. This approach is especially insightful since it takes interrelations between institutions into account that tend to be overlooked in many empirical studies, which estimate effects of single indicators only. The index used in this paper allows for two level of bundled analyses - on the levels of the dimensions of political, economic and the societal institutions, and on the overall level of democracy. This study presents evidence that a higher initial GDP level leads to a smaller effect of the institutional bundles on the level of GDP per capita. While results are only representative for a rather short panel comprising 16 years, they nevertheless reveal that there is merit to a bundled approach since the study finds conclusive results for the bundles.

JEL classification : H00; O11; O43; P51

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Contents

List of Tables

List of Figures

1. Introduction

In past decades, the theoretical and empirical analysis of the relationship between democracy and economic performance yielded mixed evidence. While some scholars find conclusive evidence for a positive relationship, others establish a significant negative relationship between the two poles, or no relationship at all. Fueled by the emergence of new institutional economics, much of the debate has shifted towards the investigation of institutions as a possible channel of transmission between democracy and economic growth, for there is plenty of anecdotal evidence that points to a positive relationship. In democratic systems, certain institutions capture the essence of democracy rather than others, and these are precisely the institutions that presumably instigate economic growth and give democracies the advantage over autocratic systems.

Considering the literature on the subject, it is striking that only few studies analyze the simultaneous influence of multiple institutions, in other words the effects of bundles of democratic institutions at once. While bundled approaches are rare, the analysis of the effect of individual institutions is all the more common. Nevertheless, since institutions rarely exists outside of a whole system of rules, it is useful to analyze their joint effects. This is especially true for the analysis of the effects of democracy, for there is not one institution that establishes a political system as a democracy. Thus, a bundled approach is the intuitive choice for the analysis at hand. This analysis contributes to literature in two respects. First, it investigates the nature of democracy from an institutional perspective, and second, it sheds some new light on the relationship between democratic institutions and growth, using a bundled approach. It finds that there is a positive relationship between both the institutional bundles and the level of GDP per capita, and the institutional bundles and the growth rate of the GDP.

A consistent definition of institutions remains elusive in economics research as of yet, but many scholars rally behind North's definition of institutions as "the rules of the game in a society or, more formally, [as] humanly devised constraints that shape human interaction. In consequence they structure incentives in human exchange, whether political, social, or economic (North, 1990, p. 3)". The term *institutions* will be employed in this paper following North's comprehensive definition. The course of action is as follows. The current literature on the complex nature of the relationship between democracy and growth is reviewed in section 2. Section 3 presents some insights on the essence of democracy from an institutional perspective and will provide a taxonomy for

the investigation on democracy and growth. Section 4 briefly discusses approaches for the operationalization of the abstract concept of democracy and introduces the bundle of institutions, that will be employed as an explanatory factor in the present analysis. Concerns of endogeneity will also be addressed in this section. The empirical strategy and the estimation results are then outlined in section 5. Section 6 concludes.

2. Literature Review

Lipset's 1959 modernization theory sparked an academic debate on the relationship between political systems and economic prosperity. Until today, scholars have not been able to establish an unambiguous causal direction between these two poles, since theoretical and empirical investigations on the subject brought forward mixed evidence. Plenty of work on the relationship between democracy and prosperity was done in the past decades and quintessentials lines of argument that appeared in scholarly discourse in the past fifteen years are summarized as follows. Authors like Rodrik and Wacziarg (2005) distinguish between well-established and those democracies, that have been existing for less than five years. They find that a change in regime type towards democracy is beneficial because those countries categorized as a young democracies grew 0.87% faster than the established democracies. Rodrik and Wacziarg say that democratic structures emerge following periods of low economic growth and will not precede them (cf. Rodrik/Wacziarg, 2005, p. 50). Hence, they find themselves aligned with Hayek (1960), who was convinced that the benefits of democracy would appear in the long run. In general, the literature associated with this conviction is known as the *development theory of democratic government*. Papaioannou and Siourounis (2008) add to this strand of literature. They develop a dichotomous index of democracy from Freedom House and Polity IV data and analyze a panel covering 166 countries from 1960 to 2003. They estimate an annual effect of a 1% increase in GDP per capita growth. While they find that growth rates decline substantially during the transition period, they find growth rates that are both stable and much higher after the transition period (cf. Papaioannou/Siourounis, 2008). Other researchers like Acemoglu et al. (2014) as well as Persson and Tabellini (2006) also estimate positive long-run effects of democratization on the growth of the GDP per capita. They show a growth in GDP per capita of 12.5% in a panel of 175 countries form 1960 to 2010 and 20% for a panel of 150 countries form 1960 to 2000 respectively. Persson and Tabellini furthermore distinguish between the two cases of

presidential and parliamentary democracy, finding that newly established parliamentary democracies exhibit 1.5% less growth than young presidential democracies. In 2008, the authors show that a relapse into autocracy comes with a decline in the annual GDP per capita growth rate of 2% (cf. Acemoglu et al., 2014 and Persson/Tabellini, 2006). Gerring et al. also investigate the long-term influence of democracy. Since their initial estimation employing only Polity IV data does not yield conclusive results, they create a new democracy index using Polity II data and thereafter find a positive influence of democracy on the growth of the GDP per capita (cf. Gerring et al., 2005, p. 350).

Authors like Bates et al. (2012) limit their analysis to one particular region of the world to enhance the comparability, in their case to Africa. Their panel consists of 105 countries, among those 42 in Sub-Saharan Africa, from 1955 to 2007. They show that a one-unit rise of the Polity IV index promotes a rise in the GDP per capita of 1.5% (cf. Bates et al., 2012, p. 328). Rock focuses his attention on Asian countries from 1960 until 2004 and also uses Polity IV data in order to assess regime types. His interest is sparked by the fact that many non-democracies achieved high rates of GDP per capita growth in this region. He finds that autocracies do not grow faster than democracies, but by contrast he finds positive effects of democracy on growth (cf. Rock, 2009). Other authors consider the effects of democracy on economic growth for specific sectors. Aghion et al. (2007) for example investigate output growth rates for 180 countries between 1963 and 2003. They find that democratic institutions are most conducive to growth in sectors close to the technological frontier. They name low market entry barriers, competition and innovation, which are promoted in democratic systems, as channels of transmission (cf. Aghion et al., 2007, p. 19).

It is well established by now that the relationship between democracy and economic growth is not a simple one, but that it is rather complex. Apart from the regional and industry scope of a study, differences in country development are subject of scholarly discussion. Gasiorowski (2000) assumes that there will be a heteroscedastic error term in a dataset that combines highly-developed and less-developed countries. He thus limits his panel to 49 underdeveloped countries from 1968 to 1991. His dependent variable is the growth of the level of GDP, not the GDP per capita. He finds that growth is slower in more-democratic societies compared to faster growth in less-democratic regimes (cf. Gasiorowski, 2000, p. 341). Acemoglu et al. (2014) share this view and also believe democracy to impair growth in developing countries (cf. Acemoglu et al., 2014). Evidence from a study by Tridico adds to the aforementioned evidence. He studies a

panel of 48 fast-developing countries with an average growth rate of 4.9% from 1995 to 2006. His measure of democracy is the *Voice and Accountability* index that is found in the World Bank's World Governance Indicators. His analysis yields a negative relationship between GDP per capita growth and the level of *Voice and Accountability*. He himself criticizes his own methodology as flawed and argues against the use of the GDP per capita as a proxy for development, since this variable does not reflect inequality per se. He thus also uses the Human Development Index by the UNO as dependent variable (cf. Tridico, 2010). This evidence supports the negative perspective on democracy and growth, at least for the case of developing countries.

Adding to the complexity of the relationship between democracy and growth is evidence for the skeptical perspective that studies the transmission channels between the two poles. In his seminal 1996 study, Barro finds that free markets, the rule of law, human capital and low government consumption do have a positive influence on GDP per capita growth in a panel comprising 100 countries from 1960-1990. Interestingly, he finds a negative influence of overall democracy as approximated with Freedom House data, as soon as the aforementioned variables are kept constant. Adding to the negative perspective, his results also indicate that countries with little democratic institutions grow especially well economically (cf. Barro, 1996, p. 14). Doucouliagos and Ulubasoglu (2008) contribute to the skeptical perspective with their meta-study of 84 independent studies on the subject of democracy and growth that were conducted between 1985 and 2005. They find that while democracy does not exert a direct influence on economic growth, it has significant positive indirect effect through the stock of human capital, political stability, low inflation rates and economic freedom, all of which the authors find in the democracies they study (cf. Doucouliagos/Ulubasoglu, 2008). Other channels of transmission that are commonly analyzed include education possibilities in democratic countries (cf. Oliva/Rivera-Batiz, 2002 and Baum/Lake, 2003 and Acemoglu et al., 2014), health care systems, which are especially influential in poor countries (cf. Baum/Lake, 2003), investment and government spending (cf. Kurzman et al., 2002 and Acemoglu et al., 2014) as well as a stable rule of law, which attracts foreign investment (cf. Oliva/Rivera-Batiz, 2002). All of the aforementioned institutional channels of transmission are found to enhance economic growth. Krieckhaus (2004) also looks for clues other than the direct relationship and he explains the mixed empirical results on the relationship between democracy and growth with the respectively considered periods of time. He himself finds a negative relationship in the 1960's and a positive one beginning in the 1980's (cf. Krieckhaus, 2004, p. 653).

Furthermore, it is all but established that the assumed relationship between democracy and economic growth is linear. For example Plümper and Martin (2003) confirm Barro's (1996) finding of an inverted u-shaped curve describing the relationship and his conclusion that moderate democracies are most conducive to growth (cf. Plümper/Martin, 2003 and Barro, 1996). Further evidence is brought forward by Almeida and Ferreira (2002), who show that autocracies have both the highest and the lowest economic growth rates while democracies exhibit moderate growth in comparison (cf. Almeida/Ferreira, 2002). Libman (2012) states in his analysis of the case of Russia that regions with hybrid regimes show considerably lower growth rates than eihter autocratic or democratic regimes (cf. Libman, 2012).

3. On the Nature of Democratic Institutions

What is the essence of democracy? Gallie wrote in 1956, that democracy is an "essentially contested concept, [...] the proper use of which inevitably involves endless disputes about [its] proper uses on the part of [its] users" (cf. Gallie, 1956, p. 169). Until today, this remains true since an unambiguous conceptualization is not agreed upon in the social sciences, which have come up with countless taxonomies, classifications and definitions of the term democracy (cf. G. L. Munck, 2007). For this study, taxonomies by Munck and Verkuilen (2002) and Mukand and Rodrik (2015) prove to be especially useful. While the former concerns the quality of the measurement methodology, the latter provides clues as to the content of a useful measure of the essence of democracy - both are adapted to an institutional perspective in this study.

Munck and Verkuilen describe three methodological challenges when constructing an index of democracy. The first one is the conceptualization of democracy. This is accomplished by distinguishing three hierarchical levels. The highest level is democracy itself, the second are its essential institutions and the third consists of the components defining the institutions. The number of institutions and components of democracy need to be carefully chosen, since choosing too many institutions leads to an over-definition, which in turn may likely be outside of the realm of empirical analysis due to data constraints. Choosing too few institutions entails the risk of leaving out essential attributes of democracy. Institutions and their components need to be on the same level of abstraction, respectively. The second challenge is the measurement itself. Indicators need to be identified that operationalize the various institutions of democracy, which is especially

challenging when the identified institutions are informal. The choice of suitable empirical indicators will undoubtfully be influenced by the availability of data, which leads to bias. Aggregation is the third challenge. The disaggregation of the conceptual level is reversed up to the highest level, namely to the level of democracy itself, in accordance with a mathematical concept that guides the aggregation. The goal is to display the level of democracy in one single numeric value (cf. G. L. L. Munck/Verkuilen, 2002).

Mukand and Rodrik focus on the essential institutional content of democracy rather than on the methodology employed to make it measurable, and thus find themselves on the second hierarchical level following the Munck and Verkuilen taxonomy. Most recently, they brought forward their classification of political systems along the lines of the existence of the institutions of property rights, political rights and civil rights. Each of these sets of rights caters to a certain sub-group of the society with property rights being important to the wealthy elite, political rights to the majority and civil rights to the minority. In that sense, they distinguish different types of political regimes, emphasizing the differences between an electoral democracy that only guarantees property and political rights, and a liberal democracy, guaranteeing all three sets of rights. While the former is basically a consensus between the elite and the majority, the latter is inclusive of all members of society (cf. Mukand/Rodrik, 2015, pp. 2-3) and therefore preferable on a normative level. Mukand and Rodrik are not the only scholars that consider political and civil rights essential to the occurrence of democracy. Marshall et al. (2002) define three crucial aspects of democracy that are strikingly similar to the aforementioned characteristics: "One is the presence of institutions and procedures through which citizens can express effective preferences about alternative policies and leaders. Second is the existence of institutionalized constraints on the exercise of power by the executive. Third is the guarantee of civil liberties to all citizens in their daily lives and in acts of political participation."(cf. Marshall et al., 2002, p. 14).

Combining both aforementioned taxonomies, the democratic institutions of political rights, property and civil rights describe the second hierarchical level as demanded by Munck and Verkuilen. The sets of rights describe the political dimension (political rights), the economic dimension (property rights) and the social dimension (civil rights) of a society. This triad of societal dimensions is also referenced in North's definition of institutions. The index of democracy used in this paper follows the lines of the Munck and Verkuilen schematics in its creation. The overall concept of democracy will be broken down into the three aforementioned dimensions, each of which will comprise

suitable institutions measured by pre-existing indicators.

4. Measurements of Democratic Institutions

There are countless measurements for democracy. Dichotomous indicators such as the ones developed by Cheibub et al.(2012) and employed by Acemoglu et al. (2014) or Boix et al. (2013) fail to take developments in democratic structures into account, since they award the same level of democracy to a well-established democracy regime like France, and to Ghana, which is newly democratic. Overall, they lack sensitivity for political developments in the public sphere. Also, implicitly, dichotomous indicators entail the assumption that democracy can be achieved from one year to another. All these concerns make results stemming from such democracy indicators difficult to interpret. Two non-dichotomous measures stand out as being the most commonly employed measures of democracy in empirical studies - the Freedom House and the Polity IV measures of democracy, both of which are subjects of thousands of analyses (cf. Coppedge et al., 2011, p. 248).

The Freedom House Index originates in the 1950's, but it was revised in 1972 and index data on 195 countries and 14 territories (as of 2014) has been published annually since 1979. The index hinges on data for the categories of political rights and civil rights. Data for both categories is combined into one single indicator that runs from 1 (free) to 7 (not free) for each observed country. Oftentimes, the index scale is inverted in empirical studies (cf. Puddington, 2015). While it is widely used, there exists plenty of criticism of the Freedom House Index. Some criticism is centered on the freedom-focused conceptualization and denies that the index attempts to measure democracy in a direct sense. Also, a higher weight is assigned to the category of political rights than to civil rights, which is of concern to some critics. Munck and Verkuilen criticize the index on the grounds of over-definition. They believe that the inlcuded socio-economic rights and property rights should not be part of the index. Furthermore, they criticize the coding of the index. When the index was first created, coding rules were not published. While this is no longer the case, the coding process for index data has changed over the years, which makes the internal consistency of the dataset questionable (cf. G. L. L. Munck/Verkuilen, 2002, p. 21). Others find fault with the index' ideological motivation in the assessment of countries. Giannone (2010) for example accuses the index of a neoliberal paradigm (cf. Giannone, 2010). Bollen and Paxton (2000) share this opinion

and state that the index favors Christian and Western countries, while Muslim and Communist countries receive lower score (cf. Bollen/Paxton, 2000). Since this is a systematic and not a random bias, adjustment through statistical methods is challenging.

The underlying dataset of the Polity IV Index contains data for 167 countries from 1800 until 2014, which enables the analysis of historical developments of political systems. The overall index is constructed from adding two separate indices, one for institutionalized democracy, the other for institutionalized autocracy. The index runs from +10 (democracy) to -10 (autocracy). Countries that score between +5 and -5 index points are considered anocracies. Just as the Freedom House index, the Polity IV index is subject to criticism on multiple levels. Again, Munck and Verkuilen criticize the index, but in this case on the grounds of under-definition. They argue that electoral participation is missing from the index as an important democratic institution. Therefore, the increasing franchise in the 19. and 20. centuries, which was important for the legitimization of the political system of democracy, is not considered (cf. G. L. L. Munck/Verkuilen, 2002, p. 11). Marshall et al. (2002), who are involved in the index creation, refute this statement by saying that measuring only the formal right to vote would be rather one-dimensional, but that political competition is included in the index through the aspects of *regulation of political participation* and *competitiveness of political participation* (cf. Marshall et al., 2002, p. 41). Munck and Verkuilen comment that these institutions are redundant and that they measure but the competitiveness of elections. They admit though that the factors of *competitiveness of executive recruitment* and *openness of executive recruitment* determine whether official positions are filled through elections or other unofficial processes (cf. G. L. L. Munck/Verkuilen, 2002, p. 14). While the methodological transparency regarding the choice of institutions and coding rules is satisfactory, Pemstein et al. (2010) criticize the non-linear categorization of political regimes. Due to the points that each group is assigned, the resulting three groups of political regimes differ in size of the range they cover (with anocracies covering the largest range), which entails potential bias (cf. Pemstein et al., 2010, p. 19). Marshall et al. anticipate some of the critical voices and do not cease to stress that democracy and autocracy should not be understood as two opposed poles in an continuum. They favor a completely separate consideration of the democracy and autocracy indices.

Measures of democracy can be categorized in terms of their straightforwardness, that is whether democracy is measured directly or through a mix of indicators. While the Freedom House and Polity IV indices are straightforward indicators, the indicator of

democracy used in this study is explicitly not straightforward. Following the approach by Munck and Verkuilen, the concept of democracy is first of all disaggregated on an institutional level. Institutions from the three dimensions of politics, economy and society need to be identified - in line with the democratic essence identified by Mukand and Rodrik and referencing North. In many studies, the analysis is conducted on the level of single institutional indicators in order to gather evidence on the influence of singular institutions on economic prosperity. Institutions that define democracy rarely exist in an isolated environment, but are part of a whole system of institutions, in which the institutions are interrelated. Therefore, in this paper, an index for democracy is used that employs a two-step procedure. First, prosperity-enhancing institutions, which are commonly present in democratic systems from the aforementioned three dimensions are identified. Then, they are aggregated into bundles on both the level of the respective dimensions and on an overall conceptual level.

5. Data and Empirical Strategy

5.1. Variables

Economic prosperity is the dependent variable in this analysis. It will be displayed both as the level of the real PPP adjusted GDP per capita, for which the natural logarithm is used, and as the annual growth rate of the real PPP adjusted GDP. Using real GDP data is a prerequisite to explain cross-country differences. The GDP data is taken from the Penn World Table, mark 8.1 (cf. Feenstra et al., 2015). Table 1 provides the summary statistics.

Table 1: Summary Statistics of Dependent Variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
ln_GDPpc	2368	8.532	1.317	4.98	11.557
G_GDP	2367	4.491	6.124	-33.101	106.28

Democracy is the independent variable in this analysis. The index used in this study is the Social Market Economy Index (SMEI). The name of the index references the social and economic order that was the foundation of German prosperity in the wake of WWII. The index aims specifically at measuring economic performance-enhancing institutions that exist within the realm of democratic political structures. Even though some of these

institutions are imaginable in autocratic contexts as well, there is one key difference, and that concerns the credibility of those institutions that might exist in both regime types for an autocrat cannot credibly commit to adhere to the institutions. The SMEI and its three dimensional sub-indices, which are the bundles that this analysis focuses on, are based on a balanced panel that comprises data for 148 countries from 1995 to 2010. Countries with less than 500.000 inhabitants and countries with a disputed status in the international community are excluded from the panel.[1] Table 2 lists the sources for the 12 single institutions that form the SMEI.[2]

Dim.	**Institution**	**Direct or Proxy**	**Source**
PIQ	Political Rights (PR)	Direct	Freedom House
PIQ	Civil Liberties (CL)	Direct	Freedom House
PIQ	Freedom from Corruption (FC)	Direct	Heritage Foundation
PIQ	Reasonable Government Spending (GS)	Direct	Heritage Foundation
EIQ	Financial Freedom (FF)	Direct	Heritage Foundation
EIQ	Business Freedom (BF)	Direct	Heritage Foundation
EIQ	Reasonable Monetary Policy (MF)	Direct	Heritage Foundation
SIQ	Education (EDU)	Direct	UNDP
SIQ	Societal Participation (WP)	Proxy	UNO MGD
SIQ	Health Care (HC)	Proxy	The World Bank
SIQ	Freedom of the Press (PF)	Direct	Freedom House
SIQ	Environmental Sustainability (ES)	Proxy	The World Bank

Table 2: Composition of the SMEI Data.

Like any other index, the SMEI is not immune to criticism. Among other aspects, it is

[1] See appendix A for a detailed list.
[2] See appendix B for a brief description of the data.

criticised for its short time dimension, for its aggregation methodology and for the fact that on three occasions effects instead of causes are used to approximate institutions. Since the SMEI is based on the assumption that it is not only the mere existence of an institution that is a determinant for economic prosperity, but its quality, the model investigates the institutional quality in its respective dimensions. Thus, the three dimensions are named Political Institutional Quality (PIQ), Economic Institutional Quality (EIQ) and Societal Institutional Quality (SIQ). By no means does this study claim that its treatment of democratic institutions is exhaustive. The only claim is that it attempts to combine essential elements of a democratic institutional framework in the following (cf. Helfer, forthcoming for a detailed description of the index methodology and the reasoning behind the choice of institutions). Table 3 displays the summary statistics of the independent variables.

Table 3: Summary Statistics of Independent Variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
EDU	2368	6.079	1.689	1.879	9.269
MF	2367	7.396	1.567	1	9.586
GS	2367	7.015	2.08	1	9.937
BF	2367	6.764	1.25	3.106	10
FC	2365	4.548	2.071	1.36	10
FF	2368	5.612	1.72	1.9	9.1
WP	2365	3.443	1.704	1	9.784
PF	2368	5.666	2.088	1	9.55
HC	2368	7.023	.942	3.844	8.461
ES	2358	9.567	.619	3.817	10
PR	2368	6.177	3.185	1	10
CL	2368	6.187	2.605	1	10
PIQ	2368	5.982	1.588	1.454	9.134
EIQ	2368	6.59	1.2	2.2	9.397
SIQ	2368	6.352	.964	4.266	8.975
SMEI	2368	6.267	1.15	2.652	8.866

The SMEI is quite comprehensive and contains many variables that serve as standard control variables in many other empirical studies. In general, a *kitchen sink approach* of including too many variables in the model should be avoided. This study contains a set of four control variables that are standard in growth literature (cf. Justesen/Kurrild-Klitgaard, 2013, p. 458) and include a measure for regime stability taken from the Database of Political Institutions (cf. Beck et al., 2001), measures for population growth and trade volume taken from the Penn World Table, mark 8.1 dataset (cf. Feenstra et al., 2015), and a measure for oil production per capita to take the*resource curse* into account is taken from British Petroleum data (cf. British Petroleum, 2015). To take

convergence effects into account (cf. Barro, 1996), the natural logarithm of the 1990 GDP per capita is included as initial value. Table 4 presents the respective summary statistics. Additionally, multiplicative interaction terms are used to control for nonlinearities. Since the effect of the bundles on both levels and growth of GDP might be different in the US than in Brazil, interaction terms between the four bundles and the country's level of development, proxied for by the initial GDP per capita value, are created (cf. G. L. Munck, 2007).

Table 4: Summary Statistics of Control variables.

Variable	Obs	Mean	Std. Dev.	Min	Max
ln_IGDPpc	2368	8.365	1.174	6.004	10.549
Pop. Growth	2367	1.5	1.557	-3.753	20.428
Oil Prod. pc	664	132.351	276.33	.084	1513.372
Trade Volume	2368	.602	.793	.011	20.775
Regime Stability	2324	19.184	20.982	1	80

Table C.1 in the appendix displays the pairwise correlation matrix of all explanatory variables. The correlation coefficients allow for assumptions regarding the separation precision of the variables. High correlations indicate low separation precision. According to Grogan and Moers (2001), coefficients with a value greater 0,70 are of concern in that regard. Highest correlations among the bundles and their components are of not surprise. Generally, institutional factors related to economic prosperity are hard to separate and there exist content-related overlaps. While most correlation coefficients in the table are not remarkable and indicate a good separation precision, freedom of the press and political rights as well as civil liberties are highly correlated. This is hardly surprising, since the guarantee of political rights usually entails the guarantee of a free press to report on the adherence to political rights and civil liberties by all relevant members of society. Political rights and civil liberties are also highly correlated, which is again intuitive.

Using the Variance Inflation Factor (VIF) test, the independent variables were tested for multicollinearity. This is important to consider since an increase in the degree of multicollinearity potentially leads to instability in the estimates of the coefficients and to inflated standard errors. As a heuristic, a VIF value greater than 10 is considered worrisome and demands further investigation. Only the variables of political rights, civil liberties and freedom of the press display such values and again it is feasible that these are highly correlated with more than one other variable due to their inherent democratic nature. Table 5 presents the scores.

Table 5: VIF scores.

Var.	VIF	Var.	VIF	Var	VIF
CL	13.41	SIQ	4.99	SMEI	2.42
PR	12.88	PIQ	4.47	RS	2.38
PF	11.42	RS	2.74	G_POP	1.40
EDU	7.37	EIQ_B	2.47	OILpc	1.38
IGDPpc	6.05	G_POP	1.58	TV	1.20
FC	5.49	OILpc	1.408		
ES	5.12	TV	1.22		
RS	3.77				
OILpc	3.74				
FF	3.10				
HC	2.91				
BF	2.73				
GS	1.85				
WP	1.83				
G_POP	1.79				
MF	1.75				
TV	1.49				

Taking the existing correlations via scatterplot-analysis into account, there appears to be a positive relationship between the level of GDP per capita and the SMEI score, as indicated by the fitted values. It is furthermore noticeable that the relationship with the GDP appears to become weaker when displaying the EIQ in correlation with the GDP per capita, and even weaker when displaying the PIQ in correlation with the GDP per capita, while it remains strong with the SIQ. It is plausible that institutions have a strong joint effect, and that this effect is strongest when they are measured simultaneously, since they constitute a particular order of democratic institutions and interact with one another.

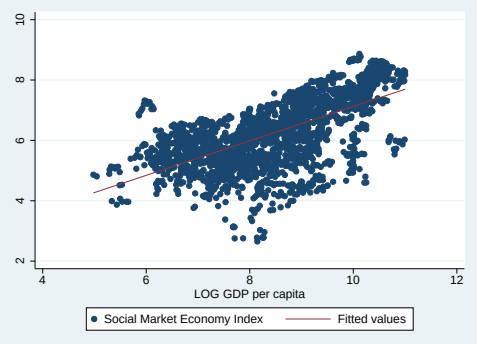

Figure 1: Scatterplot SMEI.

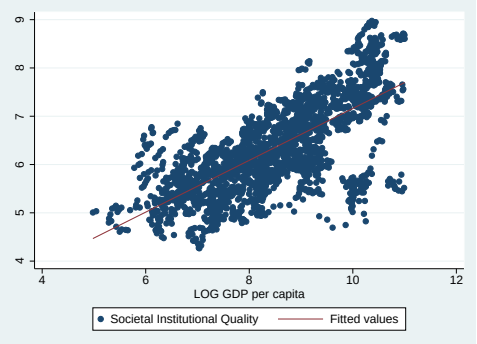

Figure 2: Scatterplot SIQ.

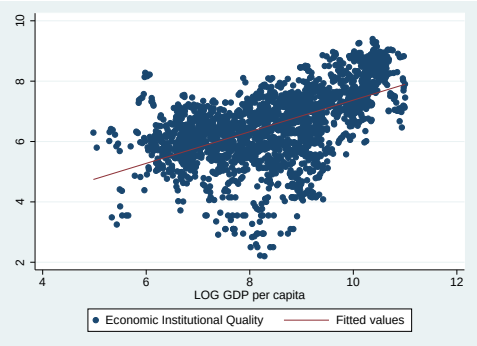

Figure 3: Scatterplot EIQ.

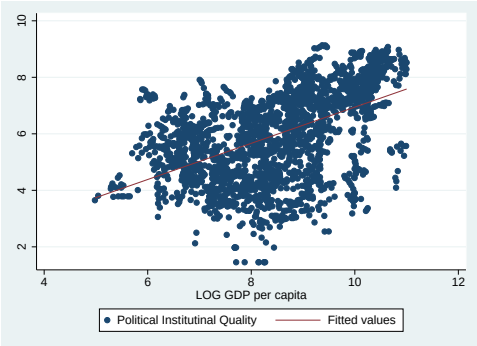

Figure 4: Scatterplot PIQ.

5.2. Addressing Data-related Concerns

Dealing with data on democracy and prosperity entails endogeneity concerns since causality may plausibly run in both directions, thus assuming correlation between the independent variables and the error term. Usually, this concern can be alleviated using fixed-effects instrumental variables regression, such as 2SLS, but this would require an adequate external instrument for the three institutional bundles and for the overall index. The use of instruments in institutional analysis is scarce. Table 6 presents an overview of the few instruments that exist.

Considering the instruments, it is apparent that many instrument institutions for a particular geographic region (former colonies, countries with mainly rainfall-irrigated agriculture, China) and are thus not suitable for a panel the covers countries beyond the specific region. The remaining instruments are also not better suited for the study at hand, since they capture broad institutional orders of e.g. European-style institutions and not specific sets of institutions such as the aimed at political, economic and social. For the lack of a suitable external instrument, this study will resort to GMM regression, in which lagged levels of the endogenous regressors are used as internal instruments. This makes the endogenous variables pre-determined and thus not correlated with the error term. A second problem could occur due to fixed-effects being correlated with the independent variables. Using difference GMM, first differences are used to remove the fixed effects, which do not vary over time. A third problem could arise from autocorrelation from the lagged dependent variable that is included through the initial GDP value. Using GMM, the lagged dependent variable is also instrumented with its past levels. Regarding the composition of the SMEI data, we find a short time dimension of 16 years and a larger country dimension of 148 countries. This type of panel-data demands

Table 6: Instruments in Institutional Analysis.

Authors	**Instrument**	**Intuition**
Acemoglu et al. (2001)	Settler Mortality	Low mortality rates were an incentive for long-run settlements and therefore investments in good institutions
Fang & Zhao (2007)	Enrollment in Christian Missionary Schools	China's "modernization" was based on western ideas, enrollment reflects western influence in the early 20th century
Hall & Jones (1998)	Characteristics of Geography	Europeans were more likely to settle in areas with a similar climate
Hall & Jones (1998)	% of Western European Languages as a mother tongue	"correlation seems perfectly natural"
Mauro (1995)	Ethnolinguistic Fractionalization	Individualism vs collectivism
Miguel et al. (2004)	Rainfall Variation	In economies that agriculturally largely depend on rainfall, weather shocks influence GDP growth

for the use of the Arellano-Bond GMM estimator, which was specifically designed for small-T-large-N panels.

5.3. Empirical Strategy and Results

The baseline model for estimation using the log GDP per capita as dependent variable follows

$$\begin{aligned} lnGDPpc_{i,t} = \beta_0 + \beta_1 PIQ_{i,t-4} + \beta_2 PIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_3 EIQ_{i,t-4} + \beta_4 EIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_5 SIQ_{i,t-4} + \beta_6 SIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_7 SMEI_{i,t-4} + \beta_7 SMEI_{i,t-4} \times InitlnGDPpc + C_{i,t}\beta_9 + \mathcal{U}_{i,t} \end{aligned}$$

where C_{it} is the vector of control variables and $\mathcal{U}_{i,t}$ designates a composite term consisting of time and country fixed effects as well as of the error term.

The baseline model for estimation using GDP growth as dependent variable follows

$$\begin{aligned} G\_GDP_{i,t} = \beta_0 + \beta_1 PIQ_{i,t-4} + \beta_2 PIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_3 EIQ_{i,t-4} + \beta_4 EIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_5 SIQ_{i,t-4} + \beta_6 SIQ_{i,t-4} \times InitlnGDPpc \\ + \beta_7 SMEI_{i,t-4} + \beta_8 SMEI_{i,t-4} \times InitlnGDPpc + C_{i,t}\beta_9 + \mathcal{U}_{i,t} \end{aligned}$$

where again C_{it} is the vector of control variables and $\mathcal{U}_{i,t}$ designates a composite term consisting of time and country fixed effects and the idiosyncratic shock. Notice that unlike in the regression with the level of GDP per capita, where the effect of the population is already controlled for, population growth is now part of the control variables. Note that the institutional bundles are included in their fourth lag. This is again done to alleviate concerns of endogeneity. The number of lags was chosen with respect to the stereotypical economic cycle, which lasts between three and five years as well as with respect to electoral cycles, which also last four or five years in many electoral systems around the world. Thus, autocorrelation can be reduced using the fourth lag.

Tables 7 and 8 present the baseline regression results of a simple and familiar OLS estimation for reference. The logarithmic GPD per capita and GDP growth are employed as dependent variables respectively. In the regression with the level of GDP per capita as dependent variable, the coefficients for all four dimensional bundles are positive, albeit only the coefficients for political institutional quality and for the overall index are significant at the 5% level. For the significant coefficients, the interpretation is straightforward: there is a positive relationship between both political institutions and the level of GDP per capita, and between the overall index measuring a democratic order and the level of GDP per capita. The interpretation of the coefficients of the interaction terms is less straightforward: they all carry the negative sign, and we observe 5% level significance for the interacted PIQ, 1% level significance for the interacted SIQ and 10% level significance for the interacted SMEI, only the interaction coefficient for EIQ is insignificant. This implies that the higher the initial level of GDP, the smaller is the influence of the two dimensions of PIQ and SIQ and of the overall index on the average level of GDP per capita. Intuitively, this makes sense, since countries, which have a high

level of GDP have on average already a set of good institutions, so that there is not much room for an increase in institutional quality. Looking at the controls, oil production is consistently significant at the 5% level and carries a positive sign, albeit the influence is rather small. This is reassuring because only few oil-producing countries are are a minority in the panel. Trade volume and regime stability consistently exert a negative influence.

Table 7: OLS Estimation with log GDP per capita.

VARIABLES	(1) ln_GDPpc	(2) ln_GDPpc	(3) ln_GDPpc	(4) ln_GDPpc
PIQlag4	0.0535**			
	(0.0231)			
EIQlag4		0.0342		
		(0.0231)		
SIQlag4			0.103	
			(0.0674)	
SMEIlag4				0.0926**
				(0.0387)
PIQlag4×D_IGDPpc	-4.93e-06**			
	(2.33e-06)			
EIQlag4×D_IGDPpc		-2.52e-06		
		(3.30e-06)		
SIQlag4×D_IGDPpc			-2.16e-05***	
			(5.74e-06)	
SMEIlag4×D_IGDPpc				-1.06e-05*
				(5.46e-06)
TV	-0.0808	-0.0955	-0.0763	-0.0928
	(0.113)	(0.110)	(0.119)	(0.115)
RS	-0.00198	-0.00214	-0.00182	-0.00176
	(0.00258)	(0.00255)	(0.00245)	(0.00261)
OILpc	0.00120**	0.00126**	0.00127**	0.00114**
	(0.000526)	(0.000497)	(0.000547)	(0.000531)
Constant	9.167***	9.168***	9.855***	9.316***
	(0.137)	(0.154)	(0.335)	(0.260)
R-squared	0.677	0.672	0.681	0.682
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	497	497	497	497

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

In the regressions with GDP growth as dependent variable, we see inconsistencies in the sign of the coefficients. While the coefficients for PIQ, EIQ and SMEI carry the negative sign, the coefficient for SIQ is positive, and is the only significant one at the

5% level, and it is furthermore striking that the effect itself is rather large. We again see the signs reversed for the interaction term coefficients. While they are all positive but insignificant for PIQ, EIQ and the SMEI, the interacted coefficient is negative and significant at the 5% level, and rather large compared to the other coefficients. Again, the interpretation hints at a necessary distinction with respect to the level of development of a country: the higher the initial level of GDP, the smaller is the influence of social institutional quality on the average level of GDP growth. This is intuitive, since high GDP per capita countries oftentimes display a high social institutional quality, while poorer countries oftentimes lack a full set of social institutions in terms of education, health care, participation and environmental sustainability. Considering the controls, we find population growth to be consistently positive and significant at the 1% level, we find negative signs but no significance for oil production and regime stability, and positive signs but still insignificance for the trade volume.

Table 8: OLS Estimation with GDP Growth.

VARIABLES	(1) G_GDP	(2) G_GDP	(3) G_GDP	(4) G_GDP
PIQlag4	-1.374			
	(4.128)			
EIQlag4		-7.069		
		(6.991)		
SIQlag4			17.25**	
			(6.500)	
SMEIlag4				-5.278
				(9.496)
PIQlag4×ln_D_IGDPpc	0.325			
	(0.500)			
EIQlag4×ln_D_IGDPpc		0.895		
		(0.801)		
SIQlag4×ln_D_IGDPpc			-1.971**	
			(0.894)	
SMEIlag4×ln_D_IGDPpc				0.845
				(1.138)
G_POP	0.651***	0.752***	0.825***	0.654***
	(0.168)	(0.181)	(0.198)	(0.164)
TV	6.159	5.996	6.307	5.532
	(6.597)	(7.096)	(6.565)	(6.744)
RS	-0.0885	-0.0962	-0.0973	-0.0896
	(0.0680)	(0.0657)	(0.0702)	(0.0639)
OILpc	-8.94e-05	0.00107	0.000225	-0.000255
	(0.00533)	(0.00544)	(0.00571)	(0.00521)
Constant	-8.321	-0.818	1.707	-8.353
	(6.257)	(5.701)	(10.47)	(8.191)
R-squared	0.170	0.166	0.163	0.170
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Observations	497	497	497	497

Robust standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Considering the explanatory value of population growth and the R^2 values, which are much smaller in the OLS estimations with GDP growth than with GDP levels, this hints at enhancement possibilities for the estimations. Therefore, tables 9 and 10 present results from the system GMM estimation for levels and growth of GDP respectively. At this point, we opt for system GMM instead of difference GMM. Since the panel consists only of 16 years and since the use of the fourth lag reduces the number instruments obtained from difference GMM even further, we resort to system GMM to increase the number of instruments. The system GMM estimator obtains a system of two equations,

one in differences and one in levels, and by adding the second equation in levels to the equation in differences, we gain additional instruments. We use a two-step estimator so that the standard covariance matrix is robust to panel-specific autocorrelation and heteroskedasticity, which is common in panel data (cf. Mileva, 2007, pp. 6-7).

Table 9 presents estimation results for regression with the level of GDP per capita as dependent variable, and the results show similarities with the respective OLS results when is comes to effect sizes and the composition of sign and significances. This hints at the robustness of the results. As expected through path dependency, the initial level of GDP per capita has a positive and strongly significant relationship with the current level of GDP per capita. Also, the coefficients for the four institutional bundles are positive, but significance can only be observed for the PIQ and SIQ dimensions and for the overall bundle of democratic institutions measured by the SMEI, but not for EIQ. For the significant coefficients, significance is at the 1% level. Again, the effect of the social institutions is the largest. As before, we see a reversal of signs when we look at the coefficients of the interaction terms. Those are all negative, but once again significance can only be seen for PIQ, SIQ and the overall SMEI, all at the 1% level. The effect of the interacted SIQ is once more the largest in comparison. Once more, we resort to the interpretation that for countries with a high initial GDP the effect of additional institutional improvement is small, since those countries on average already have a good institutional environment. In that respect, the marginal effects are noteworthy. Inserting the estimated coefficients into the first derivative of the estimation equation gives the marginal effect of a rise in the level of PIQ for any given level of the natural log of initial GDP per capita:

$$\frac{d(lnGDPpc_{i,t})}{dPIQ_{i,t-4}} = 0.480 - 0.0541 * InitlnGDPpc,$$

and this is positive for any $InitlnGDPpc < 8.9$. That is, for any country the initial natural log of the GDP per capita is lower than 8.9, a marginal increase in the level of political institutional quality raises the level of GDP per capita. If the initial natural log of the GDP per capita is higher, we observe a decrease in GDP per capita. The marginal effect of a rise of SIQ is positive for any $InitlnGDPpc < 7.5$, in case of the SMEI this is true for any $InitlnGDPpc < 9.0$ and in case of the statistically insignificant EIQ, it is true for any $InitlnGDPpc < 9.5$. It is furthermore interesting to calculate the effect of a one standard deviation increase in initial GDP per capita if the lagged PIQ is at

its mean, which corresponds to raising Bulgarias initial GDP per capita to Denmark's initial GDP per capita. Such a one standard deviation increase in initial GDP per capita corresponds to a 0.85 percentage point increase in level of current GDP per capita. For the SIQ, the effect is calculated at minus 0.08 percentage points, for the overall index, it is at 0.56 percentage points, and for the dimension of EIQ, albeit not statistically significant, it is calculated at 1.0 percentage points.

Table 9: System GMM Estimation with log GDP per capita.

VARIABLES	(1) ln_GDPpc	(2) ln_GDPpc	(3) ln_GDPpc	(4) ln_GDPpc
ln_D_IGDPpc	1.014***	1.072***	1.067***	1.037***
	(0.0179)	(0.0201)	(0.0525)	(0.0360)
PIQlag4	0.480***			
	(0.139)			
EIQlag4		0.241		
		(0.185)		
SIQlag4			1.505***	
			(0.407)	
SMEIlag4				0.876***
				(0.251)
PIQlag4×ln_D_IGDPpc	-0.0541***			
	(0.0154)			
EIQlag4×ln_D_IGDPpc		-0.0255		
		(0.0205)		
SIQlag4×ln_D_IGDPpc			-0.200***	
			(0.0501)	
SMEIlag4×ln_D_IGDPpc				-0.0978***
				(0.0269)
TV	-0.146**	-0.166***	-0.205**	-0.153
	(0.0705)	(0.0556)	(0.0822)	(0.103)
RS	-0.00573***	-0.00329**	-0.00399***	-0.00484***
	(0.00152)	(0.00163)	(0.00135)	(0.00155)
OILpc	0.00113***	0.000850***	0.00114***	0.00106***
	(0.000109)	(0.000207)	(0.000186)	(0.000122)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Instruments	185	185	185	185
AR(1)	0.012	0.020	0.211	0.018
AR(2)	0.094	0.068	0.073	0.244
Sargan Test	0.000	0.000	0.000	0.000
Hansen Test	0.025	0.265	0.068	0.084
Observations	497	497	497	497

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Both the Sargan and the Hansen test have the null hypothesis that the instruments are exogenous. While the Sargan test completely rejects the null, the Hansen test yields mixed results. The Arellano-Bond test for autocorrelation has a null of no autocorrelation. The test for AR(1) processes in first differences party rejects the null at the 5% level, except for in the third specification featuring the SIQ institutional bundle where it cannot be rejected. The test for AR(2) processes can find autocorrelation in levels. Here, it rejects the null at the 10% level in the first three specifications but cannot be rejected for the overall index of SMEI.

A different and rather inconsistent pattern emerges for the estimations with GDP growth as dependent variable in table 10. We surprisingly observe negative coefficients for the institutional bundles of PIQ and EIQ, and positive coefficients for the respective interaction terms, and we furthermore see the expected positive coefficients only for the institutional bundles of SIQ and for the overall SMEI and negative coefficients for their respective interaction terms. None of these coefficients are statistically significant for GDP growth, but we see most explanatory value in the coefficients for population growth, which are positive across all four specifications and strongly significant. Furthermore, we see 10% and 5% level significance for the oil production coefficients in the estimations with the institutional bundle of political institutions and economic institutions respectively.

To test for robustness, results from the difference GMM estimation, which uses fewer instruments, are reported in tables 11 and 12. Note that the coefficient patterns for the estimations with the level of GDP per capita as dependent variable is the same as in the system GMM estimation. The coefficients for all four institutional bundles are positive, while those of their interaction terms carry a negative sign. We see strong statistical significance in all coefficients, except for the EIQ coefficients, which are not significant. Overall, the effects are slightly larger in comparison with the system GMM.

Table 10: System GMM Estimation with GDP Growth.

VARIABLES	(1) G_GDP	(2) G_GDP	(3) G_GDP	(4) G_GDP
ln_D_IGDPpc	-3.690**	-1.485	0.512	0.377
	(1.612)	(1.032)	(2.543)	(2.350)
PIQlag4	-5.277			
	(8.644)			
EIQlag4		-2.131		
		(7.718)		
SIQlag4			2.183	
			(20.33)	
SMEIlag4				0.991
				(18.28)
PIQlag4×ln_D_IGDPpc	0.860			
	(0.893)			
EIQlag4×ln_D_IGDPpc		0.449		
		(0.834)		
SIQlag4×ln_D_IGDPpc			-0.552	
			(1.930)	
SMEIlag4×ln_D_IGDPpc				-0.00966
				(1.917)
G_POP	0.607***	0.793***	0.845***	0.519***
	(0.138)	(0.117)	(0.115)	(0.144)
TV	10.66	6.639	12.99**	-3.176
	(7.006)	(4.236)	(5.059)	(7.523)
RS	-0.150	-0.0780	-0.0436	-0.0725
	(0.112)	(0.0967)	(0.0883)	(0.0903)
OILpc	0.00662*	0.00587**	0.00485	0.00418
	(0.00382)	(0.00230)	(0.00328)	(0.00271)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Instruments	208	208	208	208
AR(1)	0.035	0.046	0.030	0.060
AR(2)	0.372	0.355	0.346	0.437
Sargan Test	0.000	0.000	0.000	0.000
Hansen Test	0.985	0.995	0.980	1.000
Observations	497	497	497	497

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Considering the growth regressions in table 12, we observe subtle differences in comparison with the system GMM estimation. For instance, while the explanatory value of the population growth is still high with positive and strongly significant coefficients, we also see significance in the bundle coefficients. The PIQ coefficient is significant at the 10%

level and carries a negative sign, while the respective interacted coefficient is significant at the 5% level and positive. This would imply that political institutional quality has a negative relationship with GDP growth, but given that there is a high initial level of GDP per capita, the relationship is positive.

Table 11: Difference GMM Estimation with log GDP per capita.

VARIABLES	(1) ln_GDPpc	(2) ln_GDPpc	(3) ln_GDPpc	(4) ln_GDPpc
PIQlag4	0.608***			
	(0.105)			
EIQlag4		0.910***		
		(0.106)		
SIQlag4			2.580***	
			(0.251)	
SMEIlag4				1.593***
				(0.227)
PIQlag4×ln_D_IGDPpc	-0.0693***			
	(0.0112)			
EIQlag4×ln_D_IGDPpc		-0.108***		
		(0.0122)		
SIQlag4×ln_D_IGDPpc			-0.320***	
			(0.0310)	
SMEIlag4×ln_D_IGDPpc				-0.191***
				(0.0259)
TV	-0.144***	-0.130***	-0.134***	-0.120***
	(0.0324)	(0.0382)	(0.0456)	(0.0394)
RS	-0.00721***	-0.0102***	-0.000375	-0.00721***
	(0.00213)	(0.00248)	(0.000767)	(0.00175)
OILpc	0.000706***	0.000998***	0.000566***	0.000708***
	(4.72e-05)	(7.51e-05)	(7.91e-05)	(0.000111)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Instruments	75	75	75	75
AR(1)	0.024	0.088	0.113	0.008
AR(2)	0.059	0.921	0.346	0.459
Observations	453	453	453	453

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

We see the same pattern with the social institutional quality. The interpretation of these results is intuitive. Looking at those countries that currently exhibit high growth rates, e.g. the BRICS countries, those countries oftentimes do not impress with the highest institutional quality, which might also be a contributing factor to their growth pattern.

Looking then at countries with a high level of GDP and low growth rates like Germany or the United States, those already have good set of institutions and might be more susceptible to an increase institutional quality and a subsequent impact on economic growth. The negative and slightly coefficient for the interacted SIQ is inconsistent with respect to the given interpretation of the other significant coefficients.

Table 12: Difference GMM Estimation with GDP growth.

VARIABLES	(1) G_GDP	(2) G_GDP	(3) G_GDP	(4) G_GDP
PIQlag4	-11.61**			
	(5.585)			
EIQlag4		-3.794		
		(4.295)		
SIQlag4			8.544	
			(11.40)	
SMEIlag4				-17.57*
				(9.186)
PIQlag4×ln_D_IGDPpc	1.488**			
	(0.606)			
EIQlag4×ln_D_IGDPpc		0.479		
		(0.499)		
SIQlag4×ln_D_IGDPpc			-2.501*	
			(1.309)	
SMEIlag4×ln_D_IGDPpc				2.370**
				(1.016)
G_POP	0.610***	0.862***	0.726***	0.571***
	(0.109)	(0.0736)	(0.149)	(0.0663)
TV	8.871*	6.818***	11.17***	3.573
	(4.504)	(2.111)	(2.613)	(2.867)
RS	-0.0640	-0.148***	0.0618	-0.156**
	(0.0615)	(0.0528)	(0.0704)	(0.0724)
OILpc	0.0136***	0.0149***	0.0120***	0.0167***
	(0.00223)	(0.00197)	(0.00287)	(0.00245)
Country FE	Yes	Yes	Yes	Yes
Time FE	Yes	Yes	Yes	Yes
Instruments	86	86	86	86
AR(1)	0.050	0.055	0.030	0.073
AR(2)	0.387	0.370	0.310	0.395
Observations	453	453	453	453

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

6. Further Research and Conclusion

Despite its promising results, the study does have inherent limitations. Even though the concerns surrounding endogeneity have been addressed in the study at hand and some have been alleviated, omitted variable bias (OVB) remains a possible source of endogeneity. Especially considering the broad set of 148 countries covered, possible OVB should be addressed in future research. Studying cluster of countries could help to alleviate the concern of OVB. Cluster of countries that could be worth analyzing in the institutional context include the the group of oil exporting countries in connection with the resource curse, or different groups of developing countries in the grwoth context.

The aim of this paper was twofold: first, the nature of the relationship between democratic institutions and prosperity was discussed and the relevant literature was sorted into three distinct categories. Second, the utility of a bundled approach was highlighted through the empirical analysis of this relationship, Overall, it was found that the higher the initial GDP level, the smaller the effect of the institutional bundles on the level of GDP per capita. The effect of the institutional bundles on the GDP level is positive and robust for all bundles, although the effect is largest for social institutional quality. The results from the regressions with GDP growth are less conclusive, but hint at explanatory value coming from a possible future differentiation between high and low GDP countries.

It should be of value to add more years to the panel in future research. This panel at hand comprises only 16 years of observation from 1995 to 2010, and the composition of countries experiencing growth or high GDP levels, and those that do not, did not undergo radical changes in the observation period. If the panel were enlarged to cover a time period beginning in the 1960's, this is likely to change, since also those countries, that now exhibit high levels of GDP per capita and small growth rates did grow substantially in the past 50 years. While results are only representative for a rather short panel, they nevertheless reveal that there is merit to a bundled approach since the study finds conclusive results for the bundles in relation with GDP per capita levels.

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Appendices

A. Table of Excluded Countries

Country	Population (2012)	Reason for exclusion
Afghanistan	-	Data constraints
American Samoa	55,128	Number of inhabitants
Andorra	78,360	Number of inhabitants
Antigua and Barbuda	89,069	Number of inhabitants
Aruba	102,384	Number of inhabitants
Barbados	283221	Number of inhabitants
Bermuda	64,798	Number of inhabitants
Brunei Darussalam	412238	Number of inhabitants
Cabo Verde	494401	Number of inhabitants
Cayman Islands	57,570	Number of inhabitants
Channels Islands	161,235	Number of inhabitants
Cuba	-	Data constraints
Curacao	152,056	Number of inhabitants
Cyprus (Turkey)	294,906	Number of inhabitants
Democratic Republic of Congo	81,680,000	Data constraints
Dominica	71,684	Number of inhabitants
Eritrea	-	Data constraints
Faeroe Islands	49,506	Number of inhabitants
French Polynesia	273,814	Number of inhabitants
Guam	162,810	Number of inhabitants
Guyana	-	Data constraints
Greenland	56,810	Number of inhabitants
Grenada	105,483	Number of inhabitants
Haiti	-	Data constraints
Hong Kong	7154600	Status unclear
Iceland	320,716	Number of inhabitants
Isle of Man	85,284	Number of inhabitants

Country	Population	Reason for exclusion
Kiribati	100,786	Number of inhabitants
Kosovo	1807106	Status unclear
Libya	-	Data constraints
Liechtenstein	36,656	Number of inhabitants
Marshall Islands	52,555	Number of inhabitants
Macau	556,783	Number of inhabitants
Maledives	338442	Number of inhabitants
Monaco	37,579	Number of inhabitants
Myanmanr	-	Data constraints
Micronesia	103,395	Number of inhabitants
Nauru	9,488	Number of inhabitants
Nicaragua	-	Data constraints
North Mariana Islands	53,305	Number of inhabitants
New Caledonia	258,000	Number of inhabitants
Palau	20,754	Number of inhabitants
Papua New Guinea	-	Data constraints
People's Republic of Korea	24,895,000	Data constraints
Puerto Rico	3,651,545	Status unclear
Saint Kitts & Nevis	53,584	Number of inhabitants
Saint Martin (French Part)	30,959	Number of inhabitants
Samoa	188,889	Number of inhabitants
San Marino	31,247	Number of inhabitants
Sao Tome and Principe	188,098	Number of inhabitants
Seychelles	88,303	Number of inhabitants
Sint Maarten	39,088	Number of inhabitants
Somalia	-	Data constraints
Solomon Islands	-	Data constraints
South Sudan	11,562,695	Status unclear
St. Lucia	180,870	Number of inhabitants
St. Vincent and the Grenadines	109,373	Number of inhabitants
Taiwan	23,367,320	Status unclear

Country	Population	Reason for exclusion
Timor Leste	-	Data constraints
Tonga	104,941	Number of inhabitants
Turks and Caicos Islands	32,427	Number of inhabitants
Tuvalu	9,860	Number of inhabitants
The Bahamas	371,960	Number of inhabitants
United Arab Emirates	-	Data constraints
USSR	?	No longer existing
Vanuatu	247,262	Number of inhabitants
Virgin Islands	105,275	Number of inhabitants
West Bank & Gaza Strip	4,046,901	Status unclear
Yugoslavia	?	No longer existing

Table A.1: Excluded Countries

B. Data Description

Freedom House, Freedom in the World Index

Political Rights and Civil Liberties: The index covers 114 countries and 14 territories. It relies on national and international surveys, scientific studies, studies issued by NGO's and think tanks as well as on expert interviews and on site-visits. With every new publication, there a minor changes in the index in terms of the sample or the methodology. Unfortunately, there no retroactive adjustment is made. In order to create the index, 10 questions regarding Political Rights in the categories Electoral Process, Political Pluralism and Participation and Functioning of Government, and 15 question on Civil Liberties in the categories Freedom of Expression and Belief, Associational and Organizational Rights, Rule of Law, Personal Autonomy and Individual Rights are analyzed. The questions are adjusted to the political systems of the different countries, e.g. in terms of democracy or monarchy. A value between 0 and 4 is assigned to each subcategory, and the values will be added to form an aggregate value that can reach a maximum of 100 (100 = 4*10 + 4*15). In accordance with the aggregate value, an index value between 1 (high) and 7 (low) is assigned (Freedom House, 2012).

Freedom of the Press Index: The index covers 197 countries. It relies on regional visits, expert opinions, studies issued by NGO's, national and international media as well as on government and other reports. In the creation of the index, 23 questions in the categories Legal Environment (max. 30 points), Political Environment (max. 40 points) and Economic Environment (max. 30 points) are analyzed. Not every question has to be answered. The questions just offer orientation as to the assessment of the situation in the various countries. The aggregate index can reach a maximum value of 100 after addition of the category-points. The index values range between 0 (high) and 100 (low). The index values are then labeled Free (0-30 points), Partly Free (31-60 points) and Not Free (61-100 points) (Freedom House, 2014).

Heritage Foundation, Index of Economic Freedom[3]

Freedom from Corruption: The index is calculated on a scale from 0 (very corrupt) to 100 (not corrupt) from Transparency International's Corruptions Perceptions Index (CPI). In countries, in which the CPI is not reported, the index is calculated using national indicators. The sources include the Corruptions Perception Index, the Country

[3]The equations used in the creation of each of the Heritage indices can be found in the document mentioned in the references.

Commerce Index (Economist Intelligence Unit), the Country Commercial Guide (US Department of Commerce), the National Trade Estimate Report on Foreign Trade Barriers (Office of the US Trade Representative). The final index values is determined as a mean of the current value and the two previous values. Due to changes in the CPI methodology, comparability is impaired.

Financial Freedom: The index ranges between 0 (low) and 100 (high) and it analyzes five topics: the extent of government regulation of financial services, the degree of state intervention in banks and other financial firms through direct and indirect ownership, the extent of financial and capital market development, government influence on the allocation of credit, and openness to foreign competition Sources include the Staff Country Report (IMF), the Country Commerce and Industry Report Financial Services (Economist Intelligence Unit), the Country Commercial Guide (US Department of Commerce), the National Trade Estimate Report on Foreign Trade Barriers (Office of the US Trade Representative) as well as other national and international studies.

Government Spending: The index ranges between 0 (low) and 100 (high). Its methodology treats zero government spending as the benchmark. Underdeveloped countries, particularly those with little government capacity, may receive artificially high scores as a result. However, such governments, which can provide few if any public goods, are likely to receive low scores on some of the other components of economic freedom that measure aspects of government effectiveness. Sources include Organization for Economic Co-operation and Development data, Eurostat data, African Development Bank data, the Staff Country Report (IMF) and the World Economic Outlook Database.

Business Freedom: The index ranges between 0 (low) and 100 (high). It is calculated as the arithmetic mean of ten equally weighted factors mostly from the World Bank's Doing Business report. For the six countries that are not covered by the World Bank's Doing Business report, business freedom is scored by analyzing business regulations based on qualitative information from reliable and internationally recognized sources. Overall, sources include Doing Business (World Bank), the Country Commerce and Industry Report Financial Services (Economist Intelligence Unit), the Country Commercial Guide (US Department of Commerce), and official government publications of each country.

Monetary Freedom: The index ranges between 0 (low) and 100 (high). Its score is based on two factors, the weighted average inflation rate for the most recent three years

and price controls. The index relies on International Financial Statistics Online (IMF), World Economic Outlook (IMF), Views-Wire (Economist Intelligence Unit), and official government publications of each country as sources (Heritage Foundation, 2014).

World Bank, World Development Indicators

The indicators are based on data obtained from national sources like central banks or governments that publish key performance figures. They are calculated as a sum or weighted mean of single indicators.

Central government debt: Debt is defined as the entire stock of direct government fixed-term contractual obligations to others outstanding on a particular date. It includes domestic and foreign liabilities such as currency and money deposits, securities other than shares, and loans. It is the gross amount of government liabilities reduced by the amount of equity and financial derivatives held by the government. Because debt is a stock rather than a flow, it is measured as of a given date, usually the last day of the fiscal year. It is measured as a percentage of the GDP. Sources include the Government Finance Statistics Yearbook and data files (IMF), and the World Bank and OECD GDP estimates.

Life Expectancy: Life expectancy at birth indicates the number of years a newborn infant would live if prevailing patterns of mortality at the time of its birth were to stay the same throughout its life. The necessary data is derived from male and female life expectancy at birth from sources such as United Nations Population Division's World Population Prospects, the United Nations Statistical Division's Population and Vital Statistics Report, census reports and other statistical publications from national statistical offices, like Eurostat, the Secretariat of the Pacific Community and the U.S. Census Bureau.

CO_2 Emissions: Carbon dioxide emissions are those stemming from the burning of fossil fuels and the manufacture of cement. They include carbon dioxide produced during consumption of solid, liquid, and gas fuels and gas flaring. The index measures the emission in metrics tons per capita. It relies on the Carbon Dioxide Information Analysis Center, Environmental Sciences Division, Oak Ridge National Laboratory, Tennessee, United States for data (World Bank, 2014).

United Nations Development Program, Human Development Index

Education Index: The education index within the HDI is calculated using mean years of schooling and expected years of schooling. Mean years of schooling is defined as the average number of years of education received by people ages 25 and older, converted from education attainment levels using official duration of each level. Expected years of schooling is defined as the number of years of schooling that a child of school entrance age can expect to receive if prevailing patterns of age-specific enrollment rates persist throughout the child's life. The main data source is data from the UNESCO (UNDP, 2014).

United Nations, Millennium Development Goals Database

Women in Parliament: The indicator measuring the seats held by women in national parliaments is part of the third target of the Millennium Development Goals ("Promote gender equality and empower women"). The proportion of seats held by women in national parliaments is the number of seats held by women members in single or lower chambers of national parliaments, expressed as a percentage of all occupied seats. National parliaments can be bicameral or unicameral. This indicator covers the single chamber in unicameral parliaments and the lower chamber in bicameral parliaments. It does not cover the upper chamber of bicameral parliaments. Seats are usually won by members in general parliamentary elections. Seats may also be filled by nomination, appointment, indirect election, rotation of members and by-election. Seats refer to the number of parliamentary mandates, or the number of members of parliament. The proportion of seats held by women in national parliament is derived by dividing the total number of seats occupied by women by the total number of seats in parliament. There is no weighting or normalizing of statistics. The data used are official statistics received from parliaments (UN, 2014).

Table C.1: Pairwise correlations.

Var.	EDU	MF	GS	BF	FC	FF	WP	PF	HC	ES	PR	CL	PIQ	EIQ	SIQ	SMEI	RS	G_POP	TV	OILpc
EDU	1.000																			
MF	0.213	1.000																		
GS	-0.519	-0.014	1.000																	
BF	0.576	0.323	-0.338	1.000																
FCn	0.643	0.415	-0.527	0.702	1.000															
FF	0.498	0.414	-0.276	0.578	0.599	1.000														
WP	0.360	0.215	-0.294	0.218	0.387	0.260	1.000													
PF	0.553	0.336	-0.430	0.514	0.625	0.598	0.395	1.000												
HC	0.794	0.266	-0.388	0.546	0.594	0.413	0.251	0.465	1.000											
ES	-0.501	-0.161	0.325	-0.394	-0.499	-0.285	-0.050	-0.251	-0.469	1.000										
PR	0.554	0.271	-0.400	0.470	0.549	0.549	0.355	0.903	0.474	-0.174	1.000									
CL	0.609	0.343	-0.406	0.490	0.598	0.605	0.429	0.912	0.497	-0.197	0.924	1.000								
PIQ	0.567	0.407	-0.211	0.555	0.674	0.628	0.384	0.890	0.508	-0.225	0.929	0.936	1.000							
EIQ	0.531	0.745	-0.256	0.764	0.711	0.859	0.294	0.611	0.502	-0.343	0.543	0.609	0.670	1.0 > 00						
SIQ	0.810	0.328	-0.499	0.559	0.685	0.572	0.697	0.825	0.710	-0.266	0.780	0.832	0.793	0.6 > 10	1.000					
SMEIx	0.680	0.555	-0.324	0.685	0.761	0.761	0.481	0.878	0.612	-0.296	0.863	0.904	0.946	0.843	> 0.874	1.000				
RS	0.552	0.317	-0.488	0.493	0.712	0.453	0.481	0.535	0.507	-0.343	0.455	0.524	0.518	0.527	0.652	0.612 >	1.000			
G_POP	-0.488	0.042	0.326	-0.225	-0.196	-0.194	-0.234	-0.302	-0.377	-0.076	-0.346	-0.354	-0.276	-0.152	> -0.468	-0.316	-0.164	1.000		
TV	0.187	0.179	-0.107	0.263	0.275	0.234	0.116	0.162	0.184	-0.177	0.143	0.154	0.190	0.281	0.188	0.239	0.1 > 86	-0.039	1.000	
OILpc	0.118	0.132	-0.217	0.127	0.302	0.024	-0.197	0.031	0.163	-0.783	-0.092	-0.092	-0.046	0.11 > 1	-0.138	-0.020	0.041	0.455	0.342	1.000