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Prosperity-Enhancing Institutions: Towards a Comprehensive Composite Index

Helena Helfer[1]

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Abstract Institutions that potentially have a positive impact on economic performance rarely exist outside of a system of institutions; rather they are embedded in the institutional order of a country. It is thus imperative to investigate the composition of such prosperity-enhancing institutional orders. This paper proposes a measurement of bundles of institutions that channel the positive effect of democratic institutions on economic prosperity. We construct composite sub-indices measuring the political, economic and societal institutional quality as well as an overall index combining these bundles of institutions. Index data is available for 148 countries between 1995 and 2010. We obtain scores summarizing the level of prosperity-enhancing institutions that the respective countries exhibit with regard to their overall institutional setting and to the three bundles of institutions, and we grade the countries accordingly. Since the indices allow for inter-temporal comparisons, we can highlight a country's achievements in institutional development, amongst other aspects of country comparisons, and we show their value as a tool in the analysis of determinants of economic prosperity. The proposed indices are a step towards a more systematic international comparison of democratic institutional settings.

Keywords Composite index construction · Democracy · Institutions · Economic prosperity

1 Introduction

Ever since Lipset formulated his modernization theory in 1959, there has been an intense scholarly debate about the relationship between political structures and the economic performance in economies around the world. While Lipset states that there needs to be a

✉ Helena Helfer
helena.helfer@wiwi.uni-muenster.de

[1] Center for Interdisciplinary Economics, University of Münster, Scharnhorststr. 100, 48151 Münster, Germany

certain level of economic development for democratic structures to arise, other theorists like Rodrik and Wacziarg (2005) claim the opposite to be true. Findings from Acemoglu et al. (2008) or Minier (2001) show that a positive development in income does not necessarily lead to democratization in authoritarian regimes. Alesina et al. (1996) demonstrate that political instability impairs growth, which is true for democracies and non-democracies. Findings from Tridico (2010) even hint at a negative relationship between democracy and prosperity. Recently, Von Weizsäcker published an article describing the relationship between democracy and prosperous market economy structures as symbiotic stating that democracies and market economies co-evolve on an actual as well as on a normative level (cf. Von Weizsäcker 2014, 13–15). It is obvious that empirical evidence for an immediate connection between political system and economic performance remains vague, but at the same time, anecdotal evidence on the subject shows that democratic systems have been on a considerably higher path of economic growth than non-democracies. Since it is not trivial to establish a direct link between democracy and economic performance, possible transmission channels need to be investigated.

Institutions are one such channel. In recent decades, there has been a considerable amount of research on the relationship between institutions and economic performance. Researchers like Acemoglu et al. speak out in favor of institutions being the decisive factor for economic prosperity, and cite Western and Eastern Germany as well as North and South Korea as examples, in both cases the area with a market economy thrived while the other stagnated under central planning. They also argue that richer economies can afford or choose better institutions, thus fostering their wealth (cf. Acemoglu et al. 2001, 1369). A consistent definition of the term institutions remains elusive in economics research, 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, 3)".

In this study, the focus is on those institutions that channel the positive effect of democracy on growth. Since these institutional channels of transmission rarely exist outside of a whole system of institutions, but are rather embedded in the institutional order of a country, it is essential to investigate bundles of performance-enhancing institutional channels rather than analyzing isolated institutions. The purpose of this paper is to introduce a composite index, which measures the level of prosperity-enhancing institutional channels from the political, economic and societal dimension. It is based on the assumption that the interplay of the various institutional channels, which is reflected in the overall index, has a significant effect on the performance of the economy. The index will be referred to as Social Market Economy Index (SMEI),[1] referencing the political, economic and social order that was the foundation of German prosperity in the wake of WWII. Also, the proposed institutional order has some similarities with German Social Market

[1] There is one other study that presents an index of a similar name but of a different purpose, since it is aimed at specifically measuring the incidence of Social Market Economy. In 2012, Van Suntum et al. published an explorative study in partnership with the Bertelsmann Foundation. The authors categorize Walter Eucken's (1952) classic market economy principles into four index dimensions and derive all their 44 single indicators directly from Eucken's principles. Van Suntum et al. analyze eight OECD countries from the mid-nineties until 2011. They use different data series, they mix preexisting data with survey research conducted by themselves, they do not aggregate their index-dimensions into one single index-value in the end, but calculate compound index values for their respective dimensions. They find that Sweden is the country that best fits their model of a social market economy. Theirs in an impressive project that yields interesting findings for OECD countries and they propose to expand it to all EU member countries.

Economy, for example in terms of favoring a rather limited role of government. While there exist many indicators measuring isolated institutions, indices encompassing whole systems of institutions are rather rare. As such, the SMEI adds a new tool to the field of comparative economics. We also report evidence for the three-subindices, reflecting the political, economic and social institutional quality respectively, that are the basis of construction of the overall SMEI.

The remainder of the paper is structured as follows. Section 2 discusses the literature on institutional interrelations and identifies ten institutional channels of transmission of the positive effect of democracy on growth in relevant literature. A review of existing institutional indicators will be the focal point of Sect. 3. Also, the concept of the SMEI will be introduced in details in this section. Section 4 is dedicated to the methodological survey. The data as well as the techniques used in the construction process of the index will be shown. First empirical results will be presented and discussed in Sect. 5. Section 6 outlines ideas for further research and concludes.

2 Literature Review

Compared to the body of literature dealing with institutions and growth in general, literature on the interplay of institutions itself is rather scarce, but flourishes in the growth context. While some authors find certain elements of democratic regime to lead to higher and less volatile growth rates (cf. Nelson and Singh 1992; Minier 1998; Rodrik 1999, 2000; Klomp and Haan 2009; Benyishay and Betancourt 2010), others argue that freedom, and not a democratic institutional setting is the determinant for economic growth (cf. De Haan and Siermann 1998; Wu and Davis 1999; Aixala and Fabro 2009). Seemingly conflicting at first, these views can easily be reconciled, since some authors find that the positive effect of democracy on growth is transmitted through institutions related to economic freedom (cf. Fidrmuc 2003; Dawson 2003; Vega-Gordillo and Alvarez-Arce 2003; Thies 2007; Xu and Li 2008; Aixala and Fabro 2009). Rode and Gwartney analyze the relationship between democratic transitions and the aforementioned transmission channel. They find that democratization drives economic liberalization, but that this only lasts for approximately 10 years since the relationship follows the path of an inverted U (cf. Rode and Gwartney 2012, 617). Evidence on non-linearity in the relationship between democracy and growth is also found by Plümper and Martin, who similarly describe the relationship as invertedly U-shaped, whereupon moderate democracies are particularly conducive to growth (cf. Plümper and Martin 2003). This rough screening of literature on institutional interplay suggests that there is merit to a more structured analysis of institutional transmission channels in literature which is conducted in the following.

Political and civil rights institutions constitute the first channel of transmission that is embraced by relevant literature as growth inducing. Among those institutions, two stand out for their relative importance in literature: the rule of law and property rights. Zywicki stresses the importance of a stable rule of law[2] for economic prosperity. In his theoretical essay, he concludes that the institutional link between the rule of law and economic growth stems from the prevention of arbitrary government behavior through a rule of law, thus attracting investment, entrepreneurship and long-term capital development (cf. Zywicki 2003, 22). Haggard et al. stand out for their analysis of the development of the literature on the subject, ranging from initial enthusiasm to recent skepticism. They also give an

[2] For classic definitions of the rule of law, cf. Shklar (1987).

overview of the most important rule of law indicators (cf. Haggard et al. 2008, 206). In line with the argument that democracies exhibit less volatile growth rates, Rodrik (1999) states that democracies are better equipped to absorb economic shocks through societal participation and rule of law, and vice versa, societal inequality and instability would lead to lower growth rates (cf. Rodrik 1999). The positive link between political stability and growth is confirmed by Feng (2003) and Doucouliagos and Ulubasoglu (2008). Keefer and Knack show for example that polarization tendencies in a society, be it through income inequalities or ethnic conflict, impair the guarantee of property rights and thus hinder economic growth (cf. Keefer and Knack 2002, 147–148). Oliva and Rivera-Batiz elaborate on the argument linking the rule of law to growth, and add the investment dimension by explaining that a rule of law attracts foreign investment, which in turn increases growth rates (cf. Oliva and Rivera-Batiz 2002).

The second channel of transmission refers to the curbing of corruption, which is politically aimed at in democratic regimes. In literature on corruption, the results on the relationship with economic prosperity are ambiguous. Aidt accurately describes the two opposing sides as sanders and greasers,[3] sanders being those who believe that corruption impairs the economy like sand in a wheel by making political economic transactions more difficult, while the greasers believe corruption to be the grease of the economies' wheels by facilitating beneficial trades that would not have taken place otherwise. Aidt finds himself on the sanders-side since he empirically finds that corruption impairs growth (Aidt 2009, 272, 285). De Vaal and Ebben develop a theoretical model to show that, when institutions are considered, corruption will adversely affect growth when political stability and property rights are guaranteed above a certain threshold (cf. De Vaal and Ebben 2011, 120). Mauro asks why corruption persists in countries in which it is widespread when it is obvious that everybody would be better off without it. He argues that when other people steal from the government, the individual will base its decision on the lower marginal product from legal activities and the higher marginal product from corruption, since its chances of getting caught are lower. Thus, it will pursue rent seeking instead of a productive activity (cf. Mauro 2004, 16). Bentzen summarizes econometric shortcomings of past corruption analyses and finds a negative impact of corruption on economic productivity (cf. Bentzen 2012). While the empirical findings on the impact of corruption on growth might be inconclusive, there is some merit to the line of reasoning that corruption is declared as illegal in many countries and that its continuing existence hints at a weak rule of law, and this in turn is a quality that is harmful to growth.

The third institutional channel of transmission is government spending. The literature on the relationship between government spending and prosperity also yields conflicting results. One of the scholars most immersed in the subject is Barro, who found that government consumption is inversely related with economic growth, while public investment has little effect. The reason for the inverse relationship is that public consumption does not have an effect on private productivity, but reduces savings and growth through government expenditure and taxes (cf. Barro 1991, 430–432). Barro's finding that a large public sector tends to impair economic growth has been attested in subsequent studies by Engen and Skinner (1992), Grier (1997), Hansson and Henrekson (1994) or De la Fuente (1997). Fölster and Henrekson limit their study to affluent countries and find that an increase in the expenditure ratio by 10 % leads to a decrease in the economic growth rate by 0.7–0.8 percentage points (cf. Fölster and Henrekson 2001, 1516). Even so, the negative

[3] Cf. Andvig and Moene (1990) or Blackburn et al. (2006, 2010) for the "sanders" and cf. Leff (1964) and Huntington (1968) for the "greasers".

relationship between government spending and economic growth is all but established, since studies by Mendoza et al. (1997) or Easterly and Rebelo (1993) do not observe this relationship at all. Fölster and Henrekson review the literature on the relation between government expenditure and economic growth. They state that the relationship turns negative in countries, in which the government size reaches a certain threshold. Also, they find evidence for Wagner's law, which describes the interrelation between an increase in the level of income and an increase in government scope (cf. Fölster and Henrekson 2001, 1502). As hinted at before, there is evidence that higher investment and reasonable government spending leads to higher growth rates. This is found, among others, by Acemoglu et al. (2014). Kurzman et al. find an indirect positive effect on increasing investment and government spending on growth rates in democratic regimes (cf. Kurzman et al. 2002). In general, OECD statistics show that less than 20 % of the GNI is spent on public goods in developed countries, while in developing countries more than half of the GNI is spent on public goods. In developing countries, the provision of public goods might boost the economy, but above a certain threshold, government expenditure could result in the contrary (cf. Fölster and Henrekson 2001, 1503). Therefore, studies on this topic are best conducted with a contextual separation of country groups.

The fourth channel refers to a competitive and creative business environment. Thurik summarizes the rather limited literature on the entrepreneurial environment of a country and its consequences for the economic performance. He states that economic growth rates depend on the speed with which national economies embrace entrepreneurial energy (cf. Thurik 2007, 16). Van Stel et al. analyze a panel of 44 countries and discover evidence that the relationship between entrepreneurial activity and GDP growth is negative for less developed countries and positive for developed countries. The fact that an individual would be more productive in a bigger firm than in its own little shop is offered as an explanation that is supposed to be true for less developed countries (cf. Van Stel et al. 2005, 319). If the regulations are entrepreneur-friendly, this means that the government has found the correct balance between regulation and the free market. The indicator of competition and independence of businesses, especially in the financial sector, from government control is closely linked to the indicator for the entrepreneurial environment. Beck et al. analyze data for banks and conclude that financial intermediaries exert a positive influence on GDP growth (cf. Beck et al. 2000, 295–296). Furthermore, an extensive study by Lee et al. analyzing the role of big enterprises in economic growth reveals that such businesses contribute significantly to GDP per capita growth, that they contribute to GDP stability, but that an economy should not solely rely on big enterprises to stimulate growth (cf. Lee et al. 2013, 576).

Monetary institutions are the fifth transmission channel, which is taken into account. Mostly, price stability and central bank independence are analyzed in literature in this context. A study by Alesina and Summers explores the relationship of the aforementioned institutions with economic growth. In their empirical study they find that central bank independence reduces the level and variability of inflation but does have a considerable effect on long-term macroeconomic development (cf. Alesina and Summers 1993, 159). Berger et al. extensively review previous research on central bank independence and establish their own model, concluding that the negative relationship between inflation and central bank independence is robust (cf. Berger et al. 2001, 25–28). Hayo and Hefeker also work on central bank independence and find it neither necessary nor useful for reducing inflation. They argue that the reason why countries choose their central banks to be independent is rooted in the legal, political and economic system. They propose a two-step model, the first step being the decision on price stability, the second being the institutional

implementation via for example an independent central bank. Thus, the latter cannot be the cause for the former (cf. Hayo and Hefeker 2002, 669–670).

The sixth channel of transmission is education. Democracies tend to invest in human capital by using tax money to create educational opportunities (cf. Bourguignon and Verdier 2000). Many scholars agree that education is a channel through which higher growth rates can be achieved (among others, cf. Tavares and Wacziarg 2001; Oliva and Rivera-Batiz 2002; Baum and Lake 2003; Acemoglu et al. 2014). Barro finds in a panel data analysis that male schooling variables are positively related to economic growth and that those of females are not. This suggests that female human capital is not employed well in many countries (cf. Barro 1999, 237).

Li and Huang analyze data from China and show that both health care and education have a positive effect on GDP growth. Health care institutions will thus be the seventh institutional channel of transmission. A study by Bloom et al., who find a significant effect of health on aggregate output and are able to argue that it is a real worker productivity effect, supports this reasoning (cf. Bloom et al. 2004, 11). Baum and Lake analyze the positive effect of democracy on the standard of living as described by the health care system. Especially in less-developed countries, a comprehensive health care system is beneficial to growth (cf. Baum and Lake 2003).

The eighth institutional channel commonly present in a democratic system is freedom of the press. While there is little literature on the relationship between freedom of the press and prosperity, there is a study hinting at an interrelation between freedom of the press and another institutional setting. Brunetti and Weder find that a free press is an effective tool to control corruption. They establish that the higher the extent of press freedom, the lower the level of corruption (cf. Brunetti and Weder 2003, 1821).

Equality in the sense of institutions ensuring equal opportunities for the sexes constitutes the ninth channel of transmission. Malhotra and Schuler reviewed 45 empirical studies on the empowerment of women from different scientific disciplines ranging from sociology to economics. None of the studies focused on the relationship of female participation in society and economic growth and only one focused on development processes (cf. Malhotra et al. 2005, 81). This research gap demands further analysis in the future.

Institutions aiming at environmental sustainability are the tenth channel of transmission in the context of democracy and growth. It is undisputed that CO_2 emissions need to be reduced on a global scale. Keeping with economic theory on externalities, the optimal level of CO_2 emissions will hardly be zero, but without a doubt, drastic reduction is necessary to limit global warming. The indicator for environmental sustainability only takes the amount of CO_2 emitted into account and consciously ignores economic factors such as the status of economic development and the status of industrialization. Empirical evidence from e.g. Soytas and Sari implies that the reduction of carbon emission in a country like Turkey does not negatively affect economic growth (cf. Soytas and Sari 2009, 1672–1673). While this evidence might only be true for Turkey, it can still be read as a trend statement for countries of a similar level of development.

By no means does this study claim that its treatment of institutional channels is exhaustive. Discussing these institutional channels of transmission, it is evident that all of the aforementioned refer to formal institutions. Hence, the relationship between formal and informal institutions needs to be briefly addressed. While formal institutions are well researched in institutional economics, research on informal institutions needs to catch up. Methodological problems with the operationaliztation of informal institutions as well as a lack of theory contributed to them being treated as a "black box" (cf. Acemoglu and Johnson 2005) and to taking "values and norms [...] as given" (cf. Williamson 2000, 596).

Guiso et al. (2006) summarize recent efforts to shed light on the issue of informal institutions. It is evident that informal and formal institutions must be compatible in order to function (cf. Roland 2004). Informal institutions play a double-role for they constrain the formal ones and motivate their creation (cf. Nee 2005). Licht et al. seek to analyze the interplay between informal and formal institutions. Specifically, they seek to assess the relationship between culture and formal norms of governance, expressed by a rule of law, curbing corruption and democratic accountability. They find that a cultural emphasis on the individual and on autonomy has a significant and positive relationship with the perceived rule of law, freedom from corruption and democratic practices. This hints at systemic consistency in the sense of compatible formal and informal institutions (cf. Licht et al. 2007, 681–682).

3 Institutional Indicators

A multitude of institutional indicators exists and is frequently used in empirical research. Highlights are presented in the following. Many institutional indicators are designed to measure either institutional settings referring to political systems or institutional settings referring to the sphere of the economy. Among those measuring political systems, two measurements have been employed extensively, namely the Polity IV and the Freedom House indicators, both of which are used in thousands of studies (cf. Coppedge et al. 2011, 248). The Polity project was created through a study by Ted Robert Gurr, in which he developed the first dataset on political stability (cf. Gurr 1974). The most recent Polity IV dataset covers 162 countries and provides data beginning in the year 1800 in the 2013 version. An interesting exchange of arguments regarding the Polity IV index critique can be observed in literature. Munck and Verkuilen argue on the grounds of under-definition, since they believe that electoral participation is missing from the index and that it is an essential democratic institution. Therefore, the increasing franchise in the nineteenth and twentieth centuries, which helped to legitimize the political system of democracy, is not considered (cf. Munck and Verkuilen 2002, 11). Marshall et al., who are involved in the index creation, argue that measuring only formal voting rights 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, 41). Munck and Verkuilen reply 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. Munck and Verkuilen 2002, 14).

The Freedom House Index was developed by Raymon Gastil and was first published in 1972. In 2014, it covered 195 countries. Based on survey data, two distinct indices, one for political rights and one for civil liberties, are developed. In order to assess the degree of freedom that a country exhibits, the mean of both indices is calculated. Again, Munck and Verkuilen criticize the index. Unlike before, they accuse the Freedom House index of over-definition, since they believe that the included socio-economic rights and property rights should not be part of the index. Furthermore, they criticize the coding of the index, since in the beginning, 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 debateable (cf. Munck and Verkuilen 2002, 21). Others find fault with the

index' ideological motivation. Giannone accuses the index of a neoliberal paradigm (cf. Giannone 2010). Bollen and Paxton share this opinion and state that the index favors Christian and Western countries, while Muslim and Communist countries receive lower scores (cf. Bollen and Paxton 2000). Since this is a systematic and not a random bias, adjustment through statistical methods is challenging.

Cheibub et al. (2010) criticize both the Polity IV and Freedom House indicators on the grounds of being based primarily on subjective evaluations and on inadequate operational rules. Specifically, they claim that middle categories in both indicators do not provide useful information to differentiate political regime types. Furthermore, they believe that the two indicators should not be used interchangeably in regression analysis, as it is done frequently. The latter is also found by Rodrik and Wacziarg (2005) and Epstein et al. (2006). Cheibub et al. suggest their own dichotomous indicator as an alternative. Theirs takes a value of one if a democratic government is elected in fair and contested elections, and a value of zero otherwise. Data is available on an annual basis since 1950. There are some concerns regarding the usage of dichotomous indicators, since it implies that a transition to democracy can occur from one year to the next, and it furthermore awards the same degree of democracy to a long-established democracy like France and to Ghana, being a rather young and inexperienced democracy. Rode and Gwartney defend the Cheibub et al. indicator, which they employ in their own study. While they admit that this particular indicator does not capture all dimensions of a comprehensive definition of democracy, they argue that measuring a broad concept of democracy would inevitably entail using subjective data. Also, measuring a broad definition makes it difficult to distinguish between causes and effects and they mention the example of equality before the law, which could be both, an element of democracy or a consequence of it (cf. Rode and Gwartney 2012, 609).

Among the many indicators measuring economic institutions, the Economic Freedom in the World (EFW) index stands out for it frequent usage in recent years (cf. Berggren 2003 or De Haan et al. 2006). It was developed by Gwartney et al. (2015) and is published by the Canadian Fraser Institute. The adherence to 42 components in five areas[4] to the principles of free markets are measured on a scale from zero (least free) to ten (most free). The index measures economic freedom for 141 countries and is annually available for the past 15 years. Since it is based entirely on secondary sources, it can easily be duplicated and verified by others (cf. Berggren 2003). Also the EFW is not devoid of criticism. In a scholarly exchange with Cole and Lawson in literature, De Haan and Sturm accuse the EFW of endogeneity (cf. De Haan and Sturm 2007), in a reply to Cole, they criticize the pro-market position of the Fraser Institute, they question the manner of how taxes are included in the index as curbing economic freedom, and they describe the composition of categories as arbitrary (cf. De Haan and Stirm 2006). Next to the EFW, the Fraser Institute also acts as co-publisher of Vasquez and Porcnik's Human Freedom Index. Index data was published in 2008, 2010, 2011 and 2012, and the latest edition covered 152 countries. It captures 76 indicators of personal, civil and economic freedom in categories like rule of law, security and safety, freedom of association and freedom of access to foreign information among others (cf. Vasquez and Porcnik 2015). The Human Freedom Index stands out for its integration of informal institutions and is thus closely related to the literature on social capital. In his seminal definition, Putnam describes social capital as "features of societal organization, such as trust, norms and networks, that can improve the efficiency of

[4] Size of government, legal structure and security of property rights, access to sound money, freedom to trade internationally, regulation of credit, labor and business.

society by facilitating coordinated actions" (cf. Putnam 1993, 167), which also captures the intuition of informal institutions. Bjornskov relies on this definition of social capital and analyzes whether it should be treated as an unitary concept. He concludes that the dimensions of trust, norms and networks describe three distinctly different phenomena (cf. Bjornskov 2006).

In the light of this multitude of institutional indicators, the SMEI stands out for its background and its scope. It is an index specifically designed to shed light on the link between democratic institutional structures and economic growth. The content of the index reflects institutional channels of transmission that convey the positive effect of democracy on growth. This alleviates concerns following Bjornskov of measuring distinct phenomena. Since institutions are measured simultaneously in the SMEI, the assumption of institutions always being jointly embedded in the institutional order of a country is taken into account. Figure 1 presents theoretical the framework of the SMEI. The index relies on the previously described institutional channels of transmission, that are commonly found in the literature on the determinants of economic performance to be prosperity enhancing. On the lowest level of aggregation, the individual channels are grouped into the categories of political, economic and societal institutional quality. This threefold division is quite common, and also references North's definition of institutions. Each of these categories is aggregated into a sub-index in order to obtain additional analytical tools to eventually determine the relative importance of the sub-indices to economic performance. The overall SMEI is constructed through aggregation of the three sub-indices. Thus, a multidimensional composite index is created. In comparative economic analyses, the index allows for nuanced statements regarding a country's level of prosperity-enhancing democratic institutions. Its global approach combined with the possible levels of analysis makes the SMEI a valuable contribution to present literature.

On the subject of index construction in general, there is a vast literature. For brevity reasons, an extensive literature review on index construction is omitted. We found the "Handbook on Constructing Composite Indicators" by the OECD particularly helpful (cf. OECD 2008). Studies by Cherchye and Kuosmanen (2004) on benchmarking sustainable development and by Lopez-Tamayo et al. (2014) on the creation of an composite index measuring the macroeconomic, social and institutional dimensions in 77 countries

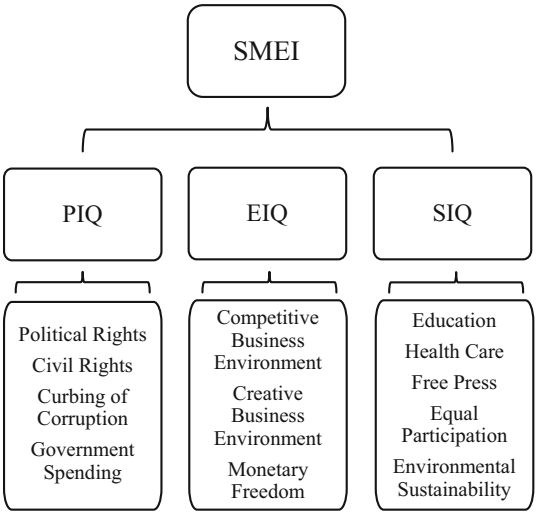

Fig. 1 Framework of the SMEI

provided important insights. Furthermore, various studies published in Social Indicators Research were of great use to get to know the methodological field of index construction, particularly a study by Mitra (2013) developing an multidimensional index measuring governance in 48 African countries, a study by Giambona and Vassallo (2014), who develop four sub-indices and a composite index to analyze social inclusion for 27 EU member countries and a study by Smits and Steendijk (2014), who propose an asset based wealth index that covers 97 low and middle income countries. Also, an article introducing a rigorous framework for the evaluation of composite indices in the development context by Booysen (2012) proved to be very insightful.

4 Methodological Survey

4.1 Data

The SMEI is 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. The exclusion of the latter is due to questionable data quality while the exclusion of the former is fairly standard in the relevant literature. Lijphart describes this occurrence for the case of comparative analyses of democracy and notes that "the smallest and least populous ministates are usually excluded; the cutoff point tends to vary between populations of one million and of a quarter of a million." (cf. Lijphart 1999, 52). While the exclusion is quite common, it is rarely followed by an adequate explanation. In case of the SMEI, the reason for exclusion of small countries is straightforward: we do not want our overall results to be distorted by the experience of very small countries, especially since very small countries will have disproportionately strong influence when using mean aggregation.

Table 1 lists the sources for the 12 institutional channels that form the index.[5] Note that we use measures of financial and business freedom to capture the institutional channels of a competitive and creative business environment. For three institutional channels, we had to resort to proxys for measurement: we use data on female seats in parliaments on national and regional levels to proxy institutions guaranteeing equal participation, we use the life expectancy at birth to proxy health care institutions and we use a measure of CO_2 emissions per capita to proxy a country's environmental sustainability institutions.

Many factors constitute a prosperity-enhancing institutional order, and it is particularly difficult to disentangle the causalities among the different indicators. It is feasible that some of the proposed indicators are determined endogenously since there are feedback mechanisms between the institutions and economic prosperity (cf. Licht et al. 2007). While it is of great importance to distinguish between institutional causes and effects in constructing any composite index, resorting to three sets of data that could be described as institutional effects rather than in case of the proxy was necessary due to data constraints. The literature on mixing causes and effects versus employing strictly one or the other remains ambiguous.[6] Among the most convincing argument as to the simultaneous use of causes and effects is the fact that certain institutional channels have a dual role. Consider for example the channel of education, which is both a cause (educated people have a higher

[5] See Appendix 1 for a brief description of the data.

[6] See Booysen (2012, 120, 144) for a detailed summary of this particular discussion.

Table 1 Composition of the SMEI data

Abbr.	Institutional channel	Direct/proxy	Source
PR	Political rights	Direct	Freedom House
CL	Civil liberties	Direct	Freedom House
FC	Curbing of corruption	Direct	Heritage Found.
GS	Government spending	Direct	Heritage Found.
FF	Financial freedom	Direct	Heritage Found.
BF	Business freedom	Direct	Heritage Found.
MF	Monetary freedom	Direct	Heritage Found.
EDU	Education	Direct	UNDP
EP	Equal particip. (women in parliament)	Proxy	UNO MGD
HC	Health care (life expect.)	Proxy	The World Bank
FP	Freedom of the press	Direct	Freedom House
ES	Environmental sustainability (CO_2 em. pc)	Proxy	The World Bank

earning potential) and an effect of economic prosperity (assuming prosperous countries can afford education).

Imputation was used to deal with missing data points in the panel. Even though imputation[7] through regression might be an elegant solution for missing imputation, in case of the SMEI, data constraints made this impossible for some data series since occasionally the regression would have been based on predicted values, possibly carrying prediction biases and errors. Also, resorting to different methods of imputation in the panel was not an option, since this could lead to inconsistencies in the dataset. For the SMEI, a variant of an unconditional mean imputation was created. The dataset was grouped according to the 21 macro geographical sub-regions defined by the United Nations Statistics Division. Missing values were then replaced with the sample arithmetic mean of their respective region, thus using the geographic region as a condition for this group mean imputation.

Let X_q be a variable associated with the single indicator q, with $q = 1, \ldots, Q$, and $x_{q,r}$ the observed value of x_q for country c in geographic region r, with $c_r = 1, \ldots, C_r$, and $r = 1, \ldots, R$. Let $nm_{q,r}$ be the number of non-missing values on X_q in region r, with regard to time $t = 1, \ldots, T$. The conditional group mean $x^t_{q,r}$ is then given by:

$$x^t_{q,r} = \frac{1}{c^{nm}_r} \sum_{c^{nm}_r=1}^{c^{nm}_r} x^{t,nm}_{q,r}$$

By using the group mean the imputed value becomes a biased estimator, and the sample variance underestimates the true variance, hence underestimating the uncertainty in the SMEI. Despite this limitation, the imputation using the group mean is a pragmatic choice.

Booysen (2012) lists general criteria for variable selection in composite index construction. While data availability is key and criteria like cross-cultural applicability and

[7] Since literature on missing data imputation is vast, only the method used for the SMEI will be presented in greater detail. For extensive surveys on the ever-developing literature, see for example Little and Schenker (1995), Little (1997) or Little and Rubin (2002). There is no heuristic that will provide the perfect method of imputation that is applicable in all cases. The appropriate method highly depends on the dataset, on the scale of the data, since some methods of imputation specifically require a metric scale, on the number of missings in relation to size of the dataset and on the country as well as on the indicator for which the data is missing (cf. OECD 2008, 62).

Table 2 Test for external validity

Var.	Correlation	Var.	Correlation	Var.	Correlation
PR	0.4591	PIQ	0.4985	SMEI	0.6156
CL	0.5099	EIQ	0.5524		
FC	0.7173	SIQ	0.6823		
GS	−0.5364				
FF	0.4634				
BF	0.6154				
MF	0.2698				
EDU	0.8377				
HC	0.8004				
FP	0.5057				
EP	0.2769				
ES	−0.6833				

comparability are assumed for the SMEI, validity of the chosen data is also a non-negligible criterion of quality. A simple test of external validity is to correlate the index and its components with a validator not included in the panel. Table 2 presents correlation coefficients for the SMEI, the sub-indices and the individual channels on the one hand and the log GDP per capita taken from World Bank data as validator on the other. The log GDP per capita is a suitable validator for the proposed index and its sub-indices represent institutional channels of prosperity-enhancing institutions.

According to Booysen (2012) an index is labeled "good" when the index and its components correlate well with the validator. With the exceptions of government spending and environmental sustainability, we find the institutional channels to be highly and positively correlated with the GDP per capita, the same is true for the three sub-indices and the SMEI. Yet, the correlation coefficients do seldom exceed 0.7, which is generally seen as a threshold of distinct difference between variables. In consequence, external validity is assumed. Counter-cyclical fiscal policy could be a reason for the negative coefficient of government spending, the fact that catch-up growth oftentimes comes with industrialization and accompanying emissions could be a reason for the negative coefficient of environmental sustainability. A judgement was passed on the latter in Sect. 2, when it was decided, that despite ambiguous evidence on the relationship between environmental sustainability and growth, the reduction of emissions would enter the SMEI as a positive argument. To further validate the selection of index components and to approach the subject of weighting of the variables, it is insightful to resort to principal component analysis (PCA) to uncover patterns in the underlying structure of the data. Table 3 presents the summary statistics for the institutional channels. The variables are in commensurable units, which leaves the opportunity to analyze the covariance matrix of the variables. But since the variances differ widely and might be subject to distortion, we opt for the analysis of the correlation matrix in the PCA.

The upper panel of Table 4 lists the eigenvalues. Since the first four principal components explain 78.5 % of the total variance, only these are listed in the lower panel of Table 4. The first principal component has roughly equally-sized loadings on all variables—with the notable exceptions of government spending and environmental sustainability, to which the aforementioned explanations apply. The first principal component alone explains 51 % of the variance. It is appropriate to infer a description of the

Table 3 Summary statistics

Variable	Obs.	Mean	SD	Min.	Max.
PR	2368	6.177	3.185	1	10
CL	2368	6.187	2.605	1	10
FC	2365	4.548	2.071	1.36	10
GS	2367	7.015	2.08	1	9.937
FF	2368	5.612	1.72	1.9	9.1
BF	2367	6.764	1.25	3.106	10
MF	2367	7.396	1.567	1	9.586
EDU	2368	6.079	1.689	1.879	9.269
HC	2368	7.023	0.942	3.844	8.461
PF	2368	5.666	2.088	1	9.55
WP	2365	3.443	1.704	1	9.784
ES	2358	9.567	0.619	3.817	10

Table 4 PCA of institutional channels

Component	Eigenvalue	Proportion	SE prop.	Cumulative
Comp1	6.11995	0.5100	0.0078	0.5100
Comp2	1.38963	0.1158	0.0035	0.6258
Comp3	1.08307	0.0903	0.0028	0.7161
Comp4	0.827095	0.0689	0.0022	0.7850
Comp5	0.613866	0.0512	0.0016	0.8361
Comp6	0.547466	0.0456	0.0015	0.8818
Comp7	0.485299	0.0404	0.0013	0.9222
Comp8	0.391754	0.0326	0.0011	0.9548
Comp9	0.219868	0.0183	0.0006	0.9732
Comp10	0.173301	0.0144	0.0005	0.9876
Comp11	0.0849285	0.0071	0.0002	0.9947
Comp12	0.0637721	0.0053	0.0002	1.0000

	Comp1	Comp2	Comp3	Comp4
PR	0.3306834	0.349632	−0.1446724	−0.2867834
CL	0.3468955	0.342686	−0.0962257	−0.1782868
FC	0.3416177	−0.1590842	0.1042364	0.1460666
GS	−0.2354965	0.1904134	0.495225	−0.1368128
FF	0.2942585	0.0932531	0.3057983	−0.1210313
BF	0.2979274	−0.184216	0.2247709	−0.0859024
MF	0.1777386	0.135917	0.6925604	0.3224854
EDU	0.3294424	−0.2553746	−0.1599352	0.0237091
HC	0.2973947	−0.310266	−0.034117	−0.0143489
PF	0.3449115	0.314169	−0.082566	−0.2088167
WP	0.1925889	0.2411294	−0.2224167	0.8199744
ES	−0.1953987	0.5650902	−0.0836267	0.0562214

Table 5 Summary statistics

Variable	Obs.	Mean	SD	Min.	Max.
PIQ	2368	5.982	1.588	1.454	9.134
EIQ	2368	6.59	1.2	2.2	9.397
SIQ	2368	6.352	0.964	4.266	8.975

Table 6 PCA of sub-indices

Component	Eigenvalue	Proportion	SE prop.	Cumulative
Comp1	2.384855	0.7950	0.0059	0.7950
Comp2	0.4139941	0.1380	0.0047	0.9329
Comp3	0.2011509	0.0671	0.0024	1.0000

	Comp1	Comp2	Comp3
PIQ	0.5992037	−0.263703	−0.7559204
EIQ	0.547405	0.8239481	0.1464831
SIQ	0.5842112	−0.5015679	0.638065

institutional setting that forms the SMEI since the first component loads positively on almost all items, and in roughly the same magnitude. Especially the latter is an indication for the use of equal weighting in the aggregation process of the SMEI. The second principal component seems to describe post-materialistic social values, especially given the loading on environmental sustainability, while the third principal component differentiates business-related variables from the rest of the index components.

In a similar fashion, a PCA is conducted using the three sub-indices, which are components in the formation of the SMEI. Table 5 lists the respective summary statistics, while Table 6 lists again the eigenvalues and the principal components. Once more, the correlation matrix is analyzed due to concerns with using the variance.

The first of the three principal components alone explains roughly 80 % of the total variance. It has positive loadings that are roughly of equal size on all sub-indices and this again suggests applying equal weights in the SMEI aggregation. The second component differentiates between political and economic institutional channels on the one hand and the social institutional channel on the other, while the third component loads negatively on the political institutions and positively on the other two.

4.2 Index Construction

4.2.1 Normalization

Since the SMEI uses 12 different data series that run on different scales, these single indicators need to be normalized. Normalization refers in most cases to a simple linear transformation of the raw data. When applied, most normalization procedures fall either in the category of standardization, in which the mean is subtracted from the observation and then divided by the standard deviation, or in the category of ranging, which scales the raw data into an interval by expressing them as relative to some reference values (cf. Ebert and

Table 7 Linear transformation I

Data series	Formula
Political rights and civil liberties	$x = (-1.5 \times PR/CL) + 11.5$
Freedom of the press	$x = (0.09 \times PF) + 1$
All Heritage Foundation data	$x = (0.09 \times Her) + 1$
Education	$x = (9 \times Edu) + 1$

Welsch 2004, 281). Out of the many possible methods of normalization,[8] a variation of the simple linear transformation in terms of ranging was employed for the SMEI, which allows for comparisons across countries and across time. Most other methods of normalization that were experimented with in the creation of the index, such as the min–max-method, only allow for cross-sectional analyses. Even if the min–max-method is modified to allow also for time-series-analyses, the transformation will collapse when new data points become available, thus limiting the datasets' ability for expansion. There are no such concerns when employing linear transformation. All data were normalized to a scale from 1 to 10, 10 indicating the highest level of institutional channels associated with prosperity.

Nine of the 12 data series that the SMEI is based on are available as normalized indices. In these cases, only a simple linear transformation was necessary to convert the given index values to the scale from 1 to 10. Table 7 displays the formulas that were used in the transformation process.

As for the remaining three data series, life expectancy, CO_2 emissions per capita and women in parliament, a normative contextual assessment had to precede the linear transformation. In general, a linear assignment of values is only applicable to indicators with a natural limit in the foreseeable future as to their manifestation. For each of the three data series, the natural limit had to be determined and a value had to be assigned to this limit. This value would then serve as a point of reference for the linear transformation. In the case of life expectancy, the normative assessment yields the belief that the higher the average life expectancy in a country, the better the institutional development. The point of reference was set at an average life expectancy of 100 years of age. The oldest documented person who ever lived died in France in 1997 at age 122. Since the average life expectancy across men and women in most industrialized countries is around 80 years of age, using 100 years of age as one reference point and 0 years as the other guarantees that the rescaling of the data will be stable for the foreseeable future. In the case of CO_2 emissions per capita, the World Bank Development Indicators showed that Qatar scored highest in 1963 with 100 metric tons of CO_2 per capita. This value has not been reached again by any country. Therefore, this all time high was used as a reference point in the transformation, as well as a level of zero emissions. For the women in parliament-data, a level of 50 % is perceived as the normative ideal in terms of gender equality. Thus, 50 % is used as one reference point, 0 % as the other. Table 8 displays the formulas that were used in the transformation process.

4.2.2 Weighting and Aggregation

In addition to the implicit weighting introduced through the scaling, the SMEI relies on equal explicit weighting (cf. Booysen 2012, 126). In addition to the evidence found in the PCA, all 12 single institutional channels and subsequently all three sub-indices are

[8] See OECD (2008, 83–88) for an overview of normalization methods.

Table 8 Linear transformation II

Data series	Formula
Life expectancy	$x = (0.09 \times LE) + 1$
CO_2 emissions per capita	$x = (-0.09 \times CO_2) + 10$
Women in parliament (<50 % and >50 %)	$x = (0.18 \times WP) + 1 \diamond x = (0.18 \times WP) - 1$

assumed to be of equal value to the overall model of an economic order. It should be stressed that equal weighting does not imply the absence of weights but deliberately assigns the same weight to all indicators. Aggregation of any index has to take the underlying theoretical framework of the index into account. To that end, in case of the SMEI, linear aggregation and geometric aggregation will be combined.

For the three sub-indices of PIQ, EIQ and SIQ linear aggregation in form of the arithmetic mean of their respective institutional channels is employed. This approach follows the approach by Van Suntum et al. (cf. Van Suntum et al. 2012, 99). Linear aggregation is possible since all single indicators have the same measurement unit. The arithmetic mean implies constant compensability between the institutional channels (cf. OECD 2008, 33). This is justifiable based on the assumption that the channels in each sub-index are nothing but an imperfect signal describing the respective dimension, since it would take many more institutional channels to adequately describe the dimensions, for most of which measurement concepts remain elusive as of yet; and it would not be enough to add more formal institutional indicators, also informal institutions would have to be taken into account. Demanding that any sub-index will only live up to its potential if a complete enumeration of single formal and informal institutional channel is accounted for does neither reflect political, nor economic nor societal reality. It is feasible that countries compensate a deficit in one institution with a higher level of another institution.[9]

Let $x_{i,t}^{q}$ be a variable associated with the single indicator q, with $q_d = 1, \ldots, Q_d$ for the respective dimensions d to which q is unambiguously assigned, in country c in dimension d, with regard to time $t = 1, \ldots, T$ and the observations $I = 1, \ldots, I$. The arithmetic mean $x_{i,t}$ is given by:

$$x_{i,t} = \frac{1}{Q_d} \sum_{q_d=1}^{Q_d} x_{i,t}^{q}$$

The SMEI itself is created through the geometric mean of the three sub-indices. This method of aggregation follows the method used by the United Nations in the creation of the HDI[10] (cf. UNDP 2013, 2).

$$SMEI(PIQ, EIQ, SIQ) = \sqrt[3]{PIQ \times EIQ \times SIQ}$$

Compared to arithmetic mean aggregation, the geometric mean emphasizes the significance of each sub-index, since it does imply limited compensability. Unlike for the sub-indices, the abandonment of compensability is intuitive for the aggregation of the overall

[9] For an overview of issues regarding the sensitivity to the normalization of the indicators in linear aggregation, see work by Herrero for a detailed explanation (cf. Herrero et al. 2010, 9).

[10] The HDI was proposed in 1990 by the UN in order to compare the developmental state of countries, based on Amartya Sen's (1985) work on functioning and capabilities. Until today, it remains one of the most impactful multidimensional indices (cf. Herrero et al. 2010, 3).

SMEI. With politics, economy and society, the three sub-indices touch on different subject matters that do complement each other, but cannot replace each other, and the abandonment of one of these dimensions would harm the overall construct of the SMEI. Furthermore, the geometric mean convinces through its relative neutrality, it does not interfere with the equal weighting derived from the PCA and it takes the dispersions between the sub-indices of SMEI negatively into account, since it penalizes the differences in values. To obtain a high position in the SMEI ranking, a country has to have high scores in all three sub-indices (cf. Herrero et al. 2010, 22). The geometric mean is also especially useful in the case of the SMEI since the data has undergone a process of normalization. The geometric mean aggregation yields a ranking that is not sensitive to the normalization process (cf. Herrero et al. 2010, 10).

5 Empirical Results

5.1 Country-Specific Evidence

The panel comprises 2368 observations, the SMEI mean is roughly 6.3 and the variance is 1.32. The minimum value found in the panel is 2.65 in Iraq in 2001, the maximum value of 8.87 is achieved by New Zealand in 2006. In the following, some SMEI scores evidencing the level of democracy-channeling institutions that are conducive to growth will be presented.[11]

Seen across all countries, it is striking that the Scandinavian countries, as well as the Netherlands, Switzerland, Australia and New Zealand in particular exhibit the highest scores or are among the higher scoring countries in the dimension rankings as well as in the SMEI. This finding applies to all years observed in the panel. Taking the Scandinavian countries of Norway, Sweden, Finland and Denmark into account, it is striking that all of their index values for all years of observation are in the 75 % percentile. Out of the Scandinavian countries, Finland scores lowest in 1996 at 7.38 and Denmarks scores highest at 8.64 in 2009 (Table 9).

Australia and New Zealand stand out for almost consistent scoring in the 95 % percentile, never scoring below 8.11 in case of Australia and 7.92 in case of New Zealand. Switzerland exhibits an index value 7.90 in 1995 and a value of 8.06 in 2010. Its values peak at 8.55 in 2009, the lowest score is in 1995. The Netherlands score lowest at 8.10 in 1998, display a peak in 2009 at 8.62 and score at 8.45 in 2010. Neighboring Germany scores the lowest in 2003 at 7.73 and the highest at 8.12 in both 2009 and 2010 on the scale from 1 to 10. The index values for Switzerland, the Netherlands and Germany are all always in the 75 % percentile and we see increases in scores between 2004 and 2006, and slight losses when comparing the values of 2009 and 2010 (Table 10).

Poland is also a country worth investigating since it has been through an enormous institutional transformation process following the end of the Cold War. Until 2004, Poland's index values are mostly descending, from 6.53 in 1995 to 7.44 in 2004, which is the peak value. Poland scored at 7.38 in 2010. Starting in 2002, the index values put Poland mostly in the 75 % percentile. Considering Poland's explicit constitutional commitment to the institutional order of a Social Market Economy and thus to a market oriented-economic order as favored by the index, these values appear to be an indication for the fact that

[11] Detailed summary statistics and correlation tables for the SMEI and for the PIQ, EIQ and SIQ indices can be found in Appendix 2.

Table 9 SMEI for Scandinavian countries

Year	NOR	SWE	FIN	DNK
1995	8.00368	7.697809	7.827888	7.842371
1996	7.789942	7.739571	7.379308	8.001078
1997	7.775763	7.957396	7.564699	8.041547
1998	7.845783	8.017417	7.63556	8.049378
1999	7.884856	8.081321	7.660545	8.159612
2000	8.007338	8.155304	7.709969	8.183981
2001	7.941123	8.146247	7.951413	8.182616
2002	7.9856	8.321712	8.3011	8.403037
2003	8.008658	8.288255	8.299592	8.575077
2004	7.956572	8.275729	8.297358	8.521661
2005	7.970623	8.270275	8.317192	8.539474
2006	8.284959	8.351364	8.455427	8.486173
2007	8.240085	8.329139	8.536087	8.525621
2008	8.176819	8.430635	8.612414	8.640255
2009	8.318708	8.473603	8.581916	8.64263
2010	8.254697	8.513646	8.477145	8.55197

Table 10 SMEI for top-ranked countries

Year	USA	DEU	AUS	NZL	CHE	NLD
1995	8.083935	7.870097	8.138935	7.923682	7.907454	8.008384
1996	8.090737	7.780221	8.117025	8.597	8.164842	8.182536
1997	8.035775	7.750229	8.225548	8.660638	8.326171	8.234733
1998	8.022895	7.402227	8.219329	8.666765	8.367414	8.100975
1999	8.048596	7.593283	8.374625	8.686489	8.364869	8.223403
2000	8.092402	7.621939	8.42671	8.635363	8.246409	8.235842
2001	8.303021	7.683435	8.458336	8.709867	8.189689	8.263602
2002	8.262394	7.801752	8.489882	8.670637	8.398344	8.35502
2003	8.270563	7.73348	8.482747	8.656609	8.385465	8.329337
2004	8.261269	7.737234	8.488985	8.659666	8.425799	8.336218
2005	8.246711	7.788744	8.501493	8.667861	8.494205	8.317655
2006	8.335474	8.036954	8.566669	8.866015	8.45965	8.494856
2007	8.22841	7.994807	8.552564	8.774377	8.378599	8.456542
2008	8.221428	8.097569	8.570003	8.769166	8.536883	8.612407
2009	8.216944	8.11856	8.588389	8.727756	8.551169	8.627493
2010	8.066294	8.11856	8.602015	8.714504	8.064352	8.448646

Poland is still in the process of institutional transformation, a process that started in the 1990 with the drastic Balcerowicz reforms. All in all, Poland is a promising example of transformation in terms of market economy, especially in comparison with its former Communist peers. Taking Russia as an example, it displays index values between 5.48 in 1995 and 5.19 in 2010, peaking in 1999 at 5.72. Russia does not exceed the 10 % percentile. Other former Communist countries, that now are part of the EU, display higher values. Even a relatively poor country like Bulgaria displays values between 5.97 in 1995

Table 11 SMEI for former Communist countries

Year	RUS	EST	POL	LVA	BGR	BLR
1995	5.482015	6.579111	6.534682	7.14153	5.971017	4.571092
1996	5.493864	6.888139	6.859087	6.550326	5.765796	3.904859
1997	5.50889	7.291619	6.871579	7.114545	5.9359	4.149672
1998	5.658421	7.457476	6.877815	7.061553	5.855388	4.179111
1999	5.724964	7.562858	6.947172	7.228803	5.572053	4.152143
2000	5.316147	7.414555	6.940884	7.200215	5.644889	4.505092
2001	5.126339	7.809262	7.043605	7.483382	6.1979	3.990966
2002	5.080373	7.976088	7.362747	7.390741	6.951415	4.001061
2003	5.200377	7.985401	7.362052	7.526056	7.02606	4.209065
2004	5.177876	8.080251	7.440453	7.604898	7.321058	4.26724
2005	5.123738	8.168606	7.410049	7.652742	7.284229	4.459527
2006	5.230442	8.140168	7.308663	7.665061	7.351508	4.541855
2007	5.304142	8.155184	7.116499	7.523917	7.266226	4.702923
2008	5.288679	8.168349	7.248213	7.566343	7.068436	4.681612
2009	5.300717	8.084209	7.260136	7.415936	7.163022	4.462944
2010	5.195708	8.049655	7.381694	7.161769	7.04197	4.494686

Table 12 SMEI for Saudi-Arabia and Qatar

Year	SAU	QAT
1995	5.005036	4.977076
1996	5.194438	4.618784
1997	5.284348	4.590055
1998	5.314977	4.768435
1999	5.185253	5.163846
2000	5.438966	5.151304
2001	5.175321	5.062305
2002	5.230109	5.238687
2003	5.035178	5.522739
2004	4.967212	5.63836
2005	5.189847	5.509478
2006	5.084146	5.463097
2007	4.932236	5.507466
2008	5.074619	5.535549
2009	5.186059	5.636408
2010	5.142403	5.696987

and 7.04 in 2010, reaching the lowest value with 5.57 in 1999 and a peak at 7.35 in 2006. Latvia, a post-USSR economic success story, values between 7.14 in 1995 and 7.16 in 2010 with a peak at 7.66 in 2006, and also Estonia, one of Russia's and Latvia's former Communist-peers reaches values between 6.58 and 8.04 between 1995 and 2010, exhibiting the highest index score at 8.17 in 2005. Compared to that, former USSR-member Belarus, sometimes dubbed Europe's last dictatorship, displays index values

Table 13 SMEI for BRICS countries

Year	BRA	RUS	IND	CHN	CAF
1995	5.660511	5.482015	5.643127	5.16192	5.150767
1996	5.540807	5.493864	5.85062	5.118847	4.872117
1997	5.640621	5.50889	5.992856	5.071292	5.01477
1998	5.609731	5.658421	6.106666	5.143012	5.183565
1999	6.464751	5.724964	6.127841	5.440836	5.286613
2000	6.674733	5.316147	5.994824	5.532671	5.256806
2001	6.691006	5.126339	6.076558	5.397534	5.205227
2002	6.765428	5.080373	6.096808	5.389457	5.514808
2003	6.89185	5.200377	6.152565	5.396733	5.271451
2004	6.75195	5.177876	6.209279	5.361112	5.430128
2005	6.846662	5.123738	6.223911	5.314458	5.748888
2006	6.717449	5.230442	6.176865	5.159862	5.758112
2007	6.462445	5.304142	6.178376	5.157146	5.412729
2008	6.478841	5.288679	6.158203	5.238766	5.311017
2009	6.57643	5.300717	6.359753	5.246512	5.220713
2010	6.558102	5.195708	6.137045	5.207365	5.133714

between 4.57 and 4.49 between 1995 and 2010, peaking at 4.70 in 2007. The example of the former Communist countries hints at a possible influencing factor of the institutional setting: EU membership comes with a commitment to Social Market Economy in article 3 of the EU Lisbon treaty since 2005, and the EU provides aid that hints at institutional adjustment to its member states, and it would appear that the former Communist countries, that are now EU members do profit from that in terms of their institutional setting (Table 11).

In this context, it is worthwhile to take Qatar and Saudi Arabia, two oil-exporting countries, into account. Qatar reaches index values between 4.98 in 1995 and 5.70 in 2010 with a low at 4.62 in 1996, and Saudi Arabia displays index values between 5.01 and 5.14 between 1995 and 2010, with a low at 4.93 in 2007. These two oil-exporting countries are much more prosperous than the aforementioned Bulgaria or Latvia, but they do exhibit a lower level of institutions associated with the proposed channels of democracy (Table 12).

Another prosperous and often-referenced country is the United States (Table 10). Its economic philosophy is considerably different from the concept of Social Market Economy, that is aimed at in the EU, traditionally favoring a more market-oriented approach. Similarly to various EU countries, the US exhibits high index values between 8.08 in 1995 and 8.07 in 2010 with a high at 8.34 in 2006, all in the 90 % percentile. The assessment of the combined examples reveals the complexity of the relationship between the institutional framework of a country on the one hand and its prosperity on the other. Even if there was a causal relationship, the direction of the causality is all but clear. And, as the example indicates, there might be secondary aspects such as a societal consensus aiming at certain institutions or other cultural factors that determine the institutional setting of a country.

The examples of the emerging countries of Brazil, Russia, India, China and South Africa (BRICS) add to that and expand the former argument to economic growth since the BRICS countries are generally rather characterized by economic growth than by level of prosperity. Brazil's and India's peak values are in the 50 % percentile, those of the others in the 25 % percentile. Overall, Brazil displays higher scores in all years of observation

than its BRICS-peers and India is the only other BRICS country to reaching almost consistently an index value of at least 6 on the scale from 1 to 10. The other countries score consistently with index values of 5, with South Africa reaching a low at 4.87 in 1996. Once more, this underlines the complexity of the relationship between the institutional framework of a country on the one hand and not only economic prosperity but also economic growth on the other. The BRICS countries score relatively low in the SMEI, thus, their economic order differs from the proposed model, which was build of democracy-channeling institutions. But the BRICS exhibit high growth rates. Again, it is noteworthy that secondary factors or specific subsets of institutions, which growing economies might share should be investigated to determine the nature of the relationship between institutional settings, economic growth and economic prosperity (Table 13).

5.2 Country-Ranking Evidence

Even though all countries are treated equally in the panel, it is useful for illustrative purposes to group the countries with their peers in order to facilitate the consideration of results for 148 countries.[12] Also, this approach makes cross-country comparisons more convincing and makes identifying benchmarks in each peer group possible. Therefore, countries are classified into four income groups, in accordance with the World Bank classification.[13] In the following, only the ranking for 2010 as the most recent year of the study will be taken into account.

When it comes to the SMEI as an aggregate, in the group of the low-income countries, Benin is ranked highest in 2010 with a score of 6.48, Zimbabwe is ranked at the bottom with 2.96. Surprisingly at first glance, only four more countries of the low-income group exhibit index values below 5 in 2010 (The Democratic Republic of Congo with 4.53, Chad with 4.61, Burundi with 4.87 and Guinea-Bissau with 4.93), and even Liberia as one of the poorest countries in the world has a score of 5.61. This shows that the index favors systems with limited government activity, e.g. enabling countries to get high scores if government spending is low, or for not emitting CO_2, even when this is not by choice but by lack of production facilities that would emit CO_2 (Table 20).

In the group of lower-middle income countries, the three leading countries are Slovenia, which reaches the highest score with 7.12 in 2010, Ghana with a score of 6.75 and Mongolia with a score of 6.66. The scoring of Slovenia as one of the poorest EU members is encouraging and underlines the importance of the EU institutional setting that comes with the membership. Ghana profits from a high score in freedom of the press and ranks in second position, making it the African country with the highest score in 2010, underlining Ghana's position in Africa as a relatively economically well-faring and politically stable country. Uzbekistan ranks at the bottom with 4.57 (Table 21). In the group of the upper-middle income countries, the three leading nations are Mauritius with a score of 7.70, Costa Rica with a score of 7.62 and South Africa with an index value of 7.44. In this group, Turkmenistan ranks at the bottom with a score of 4.34. This income group is dominated by Latin and Southern American countries, which display higher values on average than the many middle-eastern countries, which also make up for a large portion of

[12] All corresponding tables of this section can be found in Appendix 4.

[13] Low-income countries have a GNI per capita of $1045 or less, lower-middle income countries have a GNI per capita between $1046 and $4125, upper-middle income countries have a GNI per capita between $4126 and $12,745 and lastly, high-income countries have a GNI per capita of $12,746 and above. See Appendix 3 for the income groupings.

this income group. Comparing the lower-middle and upper-middle income groups, it is evident that the range of index values becomes slightly larger for the upper-middle income countries, which have values between 4.34 and 7.70 larger, while they are between 4.56 and 7.12 in the other group (Table 22).

There are a few surprises in the group of high-income countries. In 2010, the leading nations are New Zealand with a score of 8.71, Australia with a score of 8.60 and Denmark with a score of 8.55. Germany comes in at 14^{th} position with a score of 8.14. The last place in the ranking is held by Equatorial Guinea with a score of 4.60, second to last by Saudi Arabia with a score of 5.14 and third to last by Russia with 5.20. It is hardly a surprise that the countries at the top of the ranking for the high-income countries have democratic political systems (Table 23).

Noticeable patterns also emerge from looking at the three sub-indices of the overall SMEI. Since the available data is vast, only highlights are presented in the following. Firstly, it is striking that in 2010 scores are lowest in the PIQ dimension across all four income groups with a mean of 5.98, the highest scores are achieved in the EIQ dimension with a mean of 6.59. The mean in the SIQ dimension is 6.35. Taking only the group of high income countries into account, the analysis of the ranking across the three dimensions reveals eye-catching evidence. When it comes to the presence of institutions associated with PIQ, the leading country is Switzerland with a score of 9.08, followed by Chile with a score of 9.07 and Australia with a score of 8.92. Ranked at the bottom are Equatorial Guinea with 3.27, Saudi Arabia with 3.69 and Russia with 4.09 (Table 24). When it comes to the dimensions of EIQ, the latter countries rank 43th, 37th and 45th out of 45 countries respectively, Saudi Arabia being the only country exhibiting a bigger difference in rank compared to the PIQ ranking. Greece, the epicenter of the recent European debt crisis, ranks 30th in the EIQ dimension, with a score of 7.45. The leading countries in this dimension are Denmark with a score of 9.02, New Zealand with a score of 8.89 and Australia with a score of 8.89 (Table 25).

The analysis of the SIQ dimension scores for high income countries reveals a geographical clustering of countries with deficits in the societal institutional quality on the Arabian peninsula, referencing the proposed institutional setting. Qatar ranks second to last with a score of 5.27, followed by Saudi Arabia at 5.33, Oman at 5.42, Bahrain at 5.72 and Kuwait at 5.79. Sweden earns the best score at 8.94. It is followed by Norway with a score 8.71 and the Netherlands with 8.68 (Table 26).

5.3 Limitations

Despite promising empirical results, the SMEI is faced with inherent limitations that can be divided into roughly two groups, data-specific limitations and index-construction-specific limitations. Firstly, regarding the data-specific limitations, the proposed economic order is based only on formal institutions, because it is far easier to measure formal quantifiable institutions than informal ones that are seldom quantifiable. Secondly, the data used might be associated with bias. In some cases, raw data was collected in qualitative interview processes. Potential bias resulting from the interview situation and also the limited accuracy of national statistics in less-developed countries may lead to inaccuracy. Thirdly, the imputation of missing data can also lead to systematic error. The use of the regional arithmetic mean to impute the missing values creates an artificial distortion in the index leading to underestimated variance and a reduced distribution.

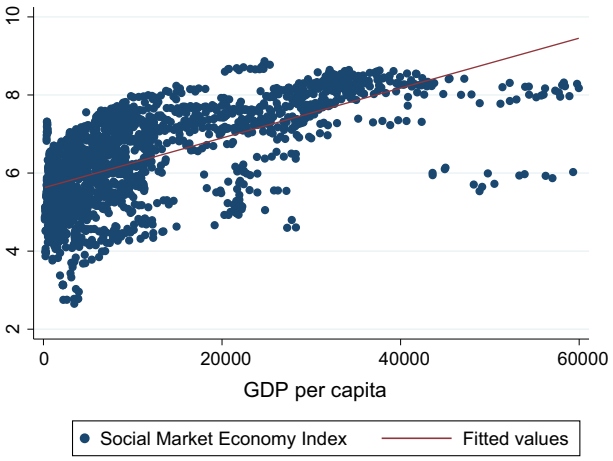

Fig. 2 Scatterplot SMEI

Regarding the construction-specific limitations, it is important to bear in mind that the proposed methodology was applied to a sample of 148 countries in order to confirm the utility of the proposed composite-index approach. Whenever a multitude of single variables is compressed into a single indicator, as in case of the SMEI, information will be lost.[14] Recalculating the SMEI, using different weighting and aggregation methodologies, and comparing the results, will be part of future research. Another interesting option for future research would be modifying the methodology for different groups of countries.

6 Conclusion

The paper proposes a composite index measuring the level of institutions that channel the positive effects of democracy on economic prosperity. It also provides tentative empirical results indicating the usefulness of the index. Since this paper is mainly methodological, all empirical results should be treated as preliminary. Despite its limitations, the SMEI can be employed in comparative country analysis in terms of benchmarking and will serve as a tool in further empirical work on the relationship between institutions and growth. To hint at the possible merit of this approach, correlations in form of scatterplot-graphs can be analyzed. The results from the scatterplots fall in line with the previous results. It is striking that none of the poorest countries achieve the highest SMEI scores and richer countries like Saudi Arabia, Qatar, Kuwait or Singapore are those that underperfom in terms of SMEI. Overall, there appears to be a positive relationship between 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 be strong and positive when displaying the EIQ in correlation with the GDP per capita, and a little weaker when displaying the PIQ in correlation with the GDP per capita, and it appears to be the weakest when displaying the SIQ in correlation with the GDP per capita. This visual evidence supports the initial claim of this study that

[14] For a more detailed discussion of index construction-specific concerns, see for example Grupp and Mogee (2004) or Booysen (2012).

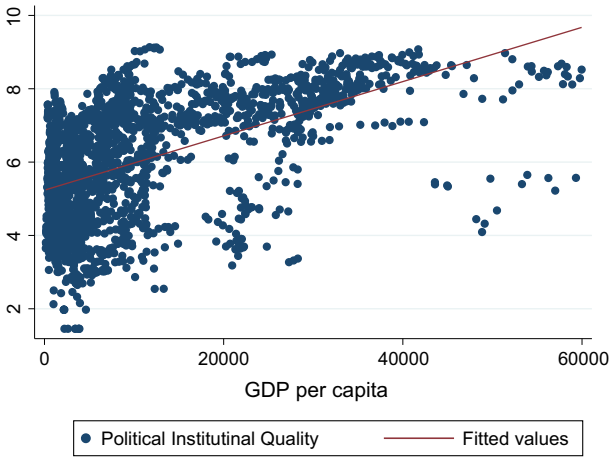

Fig. 3 Scatterplot PIQ

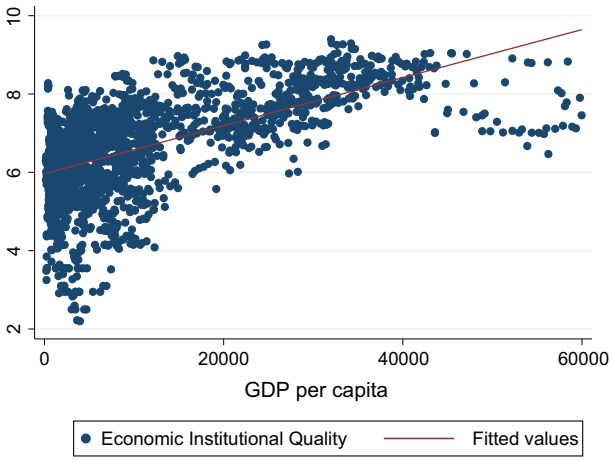

Fig. 4 Scatterplot EIQ

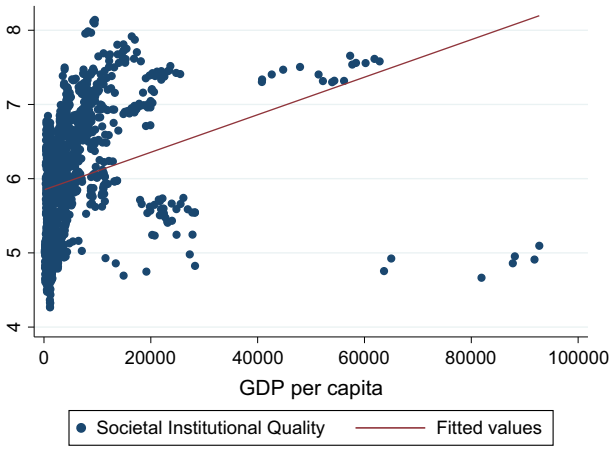

Fig. 5 Scatterplot SIQ

institutional channels of transmission of the positive effect of democracy on economic prosperity should not be analyzed separately, but in bundles of institutions (Figs. 2, 3, 4, 5).

The SMEI is designed as a tool that should be tested in relation with various indicators of economic performance in regression analyses. Taking the SMEI sub-indices into account, it will also be interesting to find which institutional dimension exerts the highest influence economic performance. Also, the index might help overcome ideological differences in economic order philosophies if it finds that particular institutional combinations, shared by prosperous, yet ideologically different economic orders are the driving force behind economic prosperity.

Appendix 1: 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, 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 ($100 = 4 \times 10 + 4 \times 15$). 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[15]

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

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

indicators. The sources include the Corruption Perceptions Index, the Country 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 3 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.

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).

Appendix 2: Summary Statistics and Correlation Tables

See Tables 14, 15, 16, 17, 18 and 19.

Table 14 Summary statistics of the SMEI values by income classes

Income class GNI/capita (US$)	High ≥12,746	Upper-middle 4126–12,745	Lower-middle 1046–4125	Low ≤1045
Obs.	704	640	576	432
Min.	4.10	2.65	3.43	2.96
Max.	8.87	7.82	7.32	6.70
Mean	7.34	6.17	5.67	5.50
SD	1.00	0.99	0.76	0.63

Table 15 Summary statistics of the PIQ values by income classes

Income class GNI/capita (US$)	High ≥12,746	Upper-middle 4126–12,745	Lower-middle 1046–4125	Low ≤1045
Obs.	704	640	576	432
Min.	2.82	1.45	2.13	2.16
Max.	9.13	8.61	7.66	7.91
Mean	7.25	5.81	5.22	5.22
SD	1.40	1.24	1.54	1.00

Table 16 Summary statistics of the EIQ values by income classes

Income class GNI/capita (US$)	High ≥12,746	Upper-middle 4126–12,745	Lower-middle 1046–4125	Low ≤1045
Obs.	704	640	576	432
Min.	4.15	2.5	2.5	2.2
Max.	9.40	8.51	8.28	7.54
Mean	7.62	6.39	6.12	5.85
SD	0.93	1.18	0.89	0.85

Table 17 Summary statistics of the SIQ values by income classes

Income class GNI/capita (US$)	High ≥12,746	Upper-middle 4126–12,745	Lower-middle 1046–4125	Low ≤1045
Obs.	704	640	576	432
Min.	4.67	4.84	4.27	4.48
Max.	8.97	8.14	6.99	6.85
Mean	7.23	6.46	5.82	5.52
SD	0.97	0.60	0.55	0.50

Table 18 Pairwise correlations across sub-indices

Variables	PIQ	EIQ	SIQ
PIQ	1.000		
EIQ	0.670	1.000	
SIQ	0.793	0.610	1.000

Table 19 Pairwise correlations across institutional channels

Variables	PR	CL	FC	GS	FF	BF	MF	EDU	HC	FP	EP	ES
PR	1.000											
CL	0.924	1.000										
FC	0.549	0.598	1.000									
GS	−0.400	−0.406	−0.527	1.000								
FF	0.549	0.605	0.599	−0.276	1.000							
BF	0.470	0.490	0.702	−0.338	0.578	1.000						
MF	0.271	0.343	0.415	−0.014	0.414	0.323	1.000					
EDU	0.554	0.609	0.643	−0.519	0.498	0.576	0.213	1.000				
HC	0.474	0.497	0.594	−0.388	0.413	0.546	0.266	0.794	1.000			
FP	0.903	0.912	0.625	−0.430	0.598	0.514	0.336	0.553	0.465	1.000		
EP	0.355	0.429	0.387	−0.294	0.260	0.218	0.215	0.360	0.251	0.395	1.000	
ES	−0.174	−0.197	−0.499	0.325	−0.285	−0.394	−0.161	−0.501	−0.469	−0.251	−0.050	1.000

Appendix 3: Income Groupings

Source: http://data.worldbank.org/about/country-and-lending-groups#High_income

For the current 2015 fiscal year, low-income economies are defined as those with a GNI per capita, calculated using the World Bank Atlas method, of $1045 or less in 2013; middle-income economies are those with a GNI per capita of more than $1045 but less than $12,746; high-income economies are those with a GNI per capita of $12,746 or more. Lower-middle-income and upper-middle-income economies are separated at a GNI per capita of $4125.

Low-income economies ($1045 or less); country grouping: 1

AFG, BGD, BEN, BFA, KHM, CAF, TCD, COD, ERI, ETH, GAM, GIN, GNB, HTI, KEN, LBR, PKR, MDG, MWI, MLI, MOZ, MMR, NPL, NER, RWA, SLE, SOM, TJK, TZA, UGA, ZWE

Lower-middle income economies ($1046–$4125); country grouping: 2

ARM, BTN, BOL, CMR, COG, CIV, DJI, EGY, SLV, GEO, GHA, GTM, GUY, HND, IDN, IND, KSV, KGZ, LAO, LSO, MRT, MDA, MNG, MAR, NIC, NGA, PAK, PNG, PRY, PHL, SEN, SLB, LKA, TLS, UKR, VNM, YEM, ZMB

Upper-middle income economies ($4126–$12,745); country grouping: 3

AGO, ALB, DZA, ARG, AZE, BLR, BLZ, BIH, BWA, BRA, BGR, CHN, COL, CRI, CUB, DOM, ECU, FJI, GAB, HUN, IRN, IRQ, JAM, JOR, KAZ, LBN, LBY, MKD, MYS, MDV, MUS, MEX, MNE, NAM, PAN, PER, ROU, SRB, ZAF, SUR, THA, TUN, TUR, TKM, VEN

High-income economies ($12,746 or more); country grouping: 4

AUS, AUT, BHS, BHR, BRB, BEL, BRN, CAN, CHL, HRV, CYP, CZE, DNK, EST, GNQ, FIN, FRA, DEU, GRC, IRL, ISR, KOR, KWT, , LTU, LUX, MAC, NLD, NZL, NOR, OMN, POL, PRT, QAT, RUS, SAU, SGP, SVK, SVN, ESP, SWE, CHE, TTO, ARE, GBR, USA, URY

The country codes refer mostly to the World Bank classification.

Appendix 4: Country Ranking Data

See Tables 20, 21, 22, 23, 24, 25 and 26.

Table 20 SMEI lower income countries 2010

Rank	Country code	SMEI
1	BEN	6.485943
2	MOZ	6.413943
3	TZA	6.391335
4	MLI	6.254187
5	UGA	6.252819
6	NPL	6.223743
7	KEN	6.1627
8	MDG	6.106269
9	BFA	6.051285
10	BGD	5.958468
11	MWI	5.794235
12	RWA	5.731634
13	SLE	5.703959
14	COM	5.669117
15	LBR	5.614015
16	KHM	5.532629
17	NER	5.441073
18	TGO	5.420876
19	TJK	5.341915
20	GIN	5.223916
21	CAF	5.133714
22	ETH	5.03498
23	GNB	4.932115
24	BDI	4.871926
25	TCD	4.605163
26	COD	4.5301
27	ZWE	2.958855

Table 21 SMEI lower-middle income countries 2010

Rank	Country code	SMEI
1	SLV	7.121729
2	GHA	6.750334
3	MNG	6.655285
4	GEO	6.633394
5	PRY	6.59797
6	PHL	6.501292
7	IDN	6.464999
8	BOL	6.410452
9	SEN	6.367488
10	ARM	6.353209
11	MDA	6.34384
12	MAR	6.205383
13	ZMB	6.185307

Table 21 continued

Rank	Country code	SMEI
14	HND	6.182832
15	IND	6.137045
16	GTM	6.100476
17	PAK	5.975901
18	LSO	5.954409
19	KGZ	5.934798
20	LKA	5.897768
21	BTN	5.695128
22	NGA	5.647207
23	UKR	5.572161
24	MRT	5.456488
25	EGY	5.445501
26	CMR	5.238467
27	VNM	5.160722
28	DJI	5.105669
29	SWZ	5.104063
30	COG	5.088999
31	SDN	5.065376
32	LAO	5.025573
33	CIV	4.957887
34	SYR	4.820418
35	YEM	4.810384
36	UZB	4.568454

Table 22 SMEI upper-middle income countries 2010

Rank	Country code	SMEI
1	MUS	7.703517
2	CRI	7.618416
3	ZAF	7.440399
4	PAN	7.358863
5	HUN	7.335284
6	PER	7.256428
7	MEX	7.063498
8	BGR	7.04197
9	JAM	7.035068
10	NAM	6.941518
11	BWA	6.934947
12	MKD	6.901418
13	ROU	6.891928
14	ALB	6.87493
15	DOM	6.833625
16	ARG	6.757843
17	MNE	6.712369
18	TUR	6.63237

Table 22 continued

Rank	Country code	SMEI
19	COL	6.630219
20	SRB	6.620927
21	BRA	6.558102
22	SUR	6.521648
23	MYS	6.4347
24	FJI	6.395822
25	THA	6.369044
26	ECU	6.337361
27	BIH	6.175213
28	LBN	6.045008
29	IRQ	5.840871
30	JOR	5.803099
31	TUN	5.775045
32	KAZ	5.670186
33	GAB	5.601474
34	AZE	5.476674
35	CHN	5.207365
36	AGO	5.180971
37	VEN	4.97856
38	IRN	4.79189
39	BLR	4.494686
40	TKM	4.340554

Table 23 SMEI high income countries 2010

Rank	Country code	SMEI
1	NZL	8.7145046
2	AUS	8.602015
3	DNK	8.55197
4	CHE	8.546957
5	SWE	8.513646
6	FIN	8.477145
7	NLD	8.448646
8	CAN	8.326713
9	IRL	8.282635
10	NOR	8.254697
11	BEL	8.165308
12	ESP	8.158216
13	GBR	8.156157
14	DEU	8.139514
15	LUX	8.066938
16	USA	8.066294
17	EST	8.049655
18	LTU	7.889134
19	AUT	7.871881

Table 23 continued

Rank	Country code	SMEI
20	KOR	7.856958
21	CHL	7.820562
22	CYP	7.753281
23	JPN	7.741045
24	SVK	7.740469
25	FRA	7.737799
26	PRT	7.737076
27	CZE	7.6337
28	SVN	7.607257
29	ISR	7.436054
30	POL	7.381694
31	GRC	7.331648
32	SGP	7.31146
33	ITA	7.305475
34	URY	7.22134
35	LVA	7.161769
36	HRV	7.151679
37	TTO	7.031196
38	BHR	6.162673
39	KWT	5.928885
40	QAT	5.696987
41	OMN	5.543304
42	RUS	5.195708
43	SAU	5.142403
44	GNQ	4.59842

Table 24 PIQ high income countries 2010

Rank	Country code	PIQ
1	CHE	9.07525
2	CHL	9.0685
3	AUS	8.91775
4	NZL	8.74675
5	URY	8.686
6	LUX	8.68375
7	CAN	8.67475
8	IRL	8.623
9	USA	8.4475
10	NOR	8.398
11	EST	8.3845
12	NLD	8.3665
13	FIN	8.26525
14	DEU	8.209
15	ESP	8.1955
16	GBR	8.17525

Table 24 continued

Rank	Country code	PIQ
17	JPN	8.14225
18	DNK	8.0875
19	SVK	8.07625
20	KOR	8.07025
21	SVN	8.04475
22	SWE	7.98175
23	AUT	7.9705
24	LTU	7.96375
25	CYP	7.948
26	BEL	7.8175
27	PRT	7.70725
28	CZE	7.696
29	POL	7.588
30	FRA	7.45525
31	ISR	7.2715
32	TTO	7.18675
33	HRV	7.17475
34	LVA	7.1665
35	GRC	7.12525
36	SGP	7.08925
37	ITA	6.907
38	KWT	5.566
39	QAT	5.24575
40	BHR	5.158
41	OMN	4.654
42	RUS	4.09375
43	SAU	3.69475
44	GNQ	3.27025

Table 25 EIQ high income countries 2010

Rank	Country code	EIQ
1	DNK	9.016
2.5	NZL	8.89
2.5	AUS	8.89
4	SWE	8.65
5	FIN	8.61
6	CAN	8.557
7	IRL	8.554
8	GBR	8.458
9	NLD	8.308
10	CHE	8.275
11	BEL	8.224
12	USA	8.182

Table 25 continued

Rank	Country code	EIQ
13	KOR	8.179
14	FRA	8.08
15	EST	8.026
16	LUX	8.02
17	ESP	8.005
18	CYP	7.996
19	LTU	7.984
20	BHR	7.936
21	DEU	7.885
22	SGP	7.873
23	JPN	7.699
24	NOR	7.69
25	AUT	7.687
26	CZE	7.633
27	SVK	7.624
28	PRT	7.606
29	ITA	7.507
30	GRC	7.45
31	ISR	7.438
32	SVN	7.279
33	CHL	7.234
34	POL	7.009
35	TTO	6.949
36	HRV	6.919
37	SAU	6.907
38	OMN	6.751
39	LVA	6.697
40	QAT	6.688
41	KWT	6.466
42	GNQ	5.971
43	URY	5.962
44	RUS	5.644

Table 26 SIQ high income countries 2010

Rank	Country code	SIQ
1	SWE	8.937841
2	NOR	8.70966
3	NLD	8.676028
4	DNK	8.577687
5	FIN	8.55336
6	NZL	8.51098
7	BEL	8.467725
8	DEU	8.33112

Table 26 continued

Rank	Country code	SIQ
9	CHE	8.313961
10	ESP	8.276541
11	AUS	8.028667
12	AUT	7.961466
13	PRT	7.900867
14	GBR	7.846715
15	CAN	7.77754
16	EST	7.75096
17	LTU	7.722357
18	IRL	7.70332
19	FRA	7.690929
20	LVA	7.653738
21	ISR	7.602341
22	USA	7.593367
23	CZE	7.5726
24	POL	7.562836
25	LUX	7.5378
26	SVK	7.53198
27	ITA	7.51951
28	SVN	7.517961
29	GRC	7.42418
30	JPN	7.3998
31	HRV	7.368413
32	KOR	7.348117
33	CYP	7.333748
34	CHL	7.291215
35	URY	7.271795
36	SGP	7.0028
37	TTO	6.960377
38	RUS	6.07052
39	KWT	5.790822
40	BHR	5.71774
41	OMN	5.421402
42	SAU	5.328731
43	QAT	5.270257
44	GNQ	4.97964

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