

Institutionalized social technologies index: A global perspective

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Abstract. *This paper presents an index of institutionalized social technologies covering its two main dimensions namely Risk reducing technologies and Anti Rent seeking technologies and in turn covers several social, institutional, political and economic aspects. Specifically it attempted to classify and measure various types of institutions based on a theoretical framework, these institutional indicators are then aggregated to measure cross country institutional qualities of 141 countries. We also test provide a comparison with other major indices.*

Keywords: institutions, factor analysis, index, rent seeking, governance.

JEL Classification: O1, O4, O5, C8.

1. Introduction

Despite of the fact the role of institutions in shaping economic history has given significant importance but the empirical literature is not matching in social sciences⁽¹⁾. The institutions are defined as the rules of the game in a society or, more formally, – the humanly devised constraints that shape human interaction. These rules of the game can be in the form of formal institutions like laws and regulations or informal ones which assimilated to culture or social capital (Tabellini, 2005; Putnam, 1993). Some institutions lowers transaction cost thereby result in innovation and productivity whereas other institutional features impedes information flow, raising information costs and eroding the gains from information, and limits the entrepreneurial activity. Examples of the institutions that stunt economic growth include government, police, court corruption, excessive taxation and regulation, unstable inconsistent monetary and fiscal policy. (Frye and Shleifer, 1997; Johnson et al., 1999, 2000; Gwartney et al., 1998, 1999; Johnson et al., 1998; Shleifer and Vishney, 1993, 1994; Soto, 1989, 2000).

North (1990, p. 54) asserts that The inability of societies to develop effective, low cost enforcement of contracts is the most important source of historical stagnation and contemporary underdevelopment in the third world. Neoclassical growth modelling Solow (1956) predicted economies move toward their steady-state growth path which means that in the long run, income per capita levels will converge. However, lack of empirical support for convergence has presented a major challenge to these models. A more refined endogenous growth theory by

Romer (1986) and Lucas (1988) and its empirics provides the evidence of conditional convergence, where convergence is conditional on factors some of which are related to institutions. This is explained by new growth theories as – knowledge spillovers assumption whereby any sector in less advanced countries can catch-up with the current technological frontier whenever it innovates. The innovation also refers to the adaptation of technologies which in turn depends upon the institutional arrangements.

The literature on the relationship between economic performance and the quality of domestic institutions shows better the quality of domestic institutions the higher the effects on the Human development and growth of a country. Institutional quality is measured in empirical literature utilizing data bases provides by various commercial (PRS and BERI), or non-commercial (WEF; Global Integrity; Bertelsmann; POLITY PROJECT and World Bank) organizations. In particular the efforts like (Kaufmann et al., 2008; Gwartney and Lawson, 2008; Miller and Holmes, 2009) as well as most of the above mentioned databases are to make the aggregate various institutional measures to form some meaningful estimates of institutional quality across nations. World Bank study focuses on institutions promoting regulating and bureaucratic efficiencies in terms of starting a business, whereas POLITY focuses on the role of political institutions. Global Integrity captures institutions pertaining to regulatory efficiency and accountability. Perhaps the most comprehensive study by Kaufmann et al. (2008) attempted to cover a wide range of institutions- which they called governance indicators – categorizing institutions in six indicators. Few attempted to

provide an aggregate picture, but this aggregation is based on the institutions' relative importance in economic performance as their authors' sees it, this clearly lacks proper theoretical bases. In this study we tried to aggregate indices to judge cross country institutional quality in a theoretical framework.

We take our queue from theoretical framework set by Douglass North (1981, pp. 20-27) that explain the roles of institutions, proposes two theories, a – Contract theory of the state and a – Predatory theory of the state. According to the first theory, the state and associated institutions provide the legal framework that enables private contracts to facilitate economic transactions hence reducing transaction costs. According to the second, the state is an instrument for transferring resources from one group to another. North (1981) emphasised that good institutions will simultaneously support private contracts and provide checks against expropriation by the government or other politically powerful groups. However, like (North (1981)), the contemporary literature has not attempted to determine the relative roles of institutions supporting private contracts and institutions constraining government and elite expropriation.

In this study, we attempted to explore these roles through the notion of institutionalized social technologies. The term – social technologies involve patterned human interaction rather than physical engineering, also has been put forth by (North and Wallis, 1994; Boserup, 1996; Day and Walter, 1987). Nelson and Sampat (2001) proposed, not all social technologies are institutions, but rather only those that have become a standard and expected thing to do, given the objectives and the setting. Institutionalized social technologies define low transaction cost ways of doing things that involve human interaction. Hence effectively institutionalized social technologies, individuals capture the social returns to their actions as private returns. It protects the output of individual productive units from diversion and also resolves the problem of asymmetric information as it develop mutual trust among agents. Whereas ineffective institutionalized social technology will not only increase the risk but also divert economic agents from innovative activities to seeking rents.

Our index of institutionalized social technologies is made up of Risk reducing technologies and Anti Rent seeking technologies. Risk reducing technology – Contract theory as put forth by North (1981), removes information asymmetry, creates mutual trust and hence decreases the risk of creating long term business relationships. It contains institutional arrangement pertaining to contract enforcement, property rights, justice system, Law enforcement and policy stability. Whereas Anti Rent seeking technologies – Predatory theory in the words of North (1981), plugs in predatory opportunities that arises due to gaps in institutions creating rents for controlling agents betting them higher return than through innovation hence making society moves from innovative to rent seeking activities. Our index contains institutions that deal in the areas of bureaucratic efficiency, ease of doing business, corruption, and competition. Hence this paper aims to captures nations' institutional performance through wide range of institutional variables by combining these variables in an index according to a theoretical framework on how these variables effect

growth and productivity. In this way the present study combines North's contract and predatory theory with the notion of social technologies.

Paper is organized as follows section 1 introduction, section 2 covers review of literature, section 3 covers methodology and rational for index components, section 4 exhibits the indices and comparison with others, and the last section gives conclusions and recommendations.

2. Review of literature

The Contract theory literature, starting with Coase (1937, 1960) and Williamson (1975, 1985), links the efficiency of organizations and societies to what type of contracts can be written and enforced, and thus underscores the importance of contracting institutions (see also Grossman and Hart, 1986; Hart and Moore, 1990; Hart, 1995). In contrast, other authors advocating predatory theory, emphasize the importance of private property rights, especially their protection against expropriation (see, among others, Jones, 1981; De Long and Shleifer; 1993, Olson 2000).

Acemoglu and Johnson (2005), attempt to distinguish between – predatory institutions and – contracting institutions. Here they find strong support for predatory institutions on current economic outcome but in contrast, the role of contracting institutions is more limited.

Concept of institutions as social technologies is consonant with the notion that institutions are – the rules of the game. Nelson and Sampat (2001) proposed that particular social technologies become institutionalized through different mechanisms and are sustained through different structures. Pelikan (2003), Institutionalized social technology are those rule routines (technology) that are imposed by society or government through laws, norms, expectations, governing structures and mechanisms, customary modes of transacting and interacting, and converted into rule constraints.

Nelson (2007) point out – Societies clearly have a degree of control over institutions like the formal structure of laws, and formal organizational designs and designated authority relationships. Baumol (1990) pointed out information asymmetry through rent seeking or organized crime is curbed through strong institutions – so only venue left for competition and dominance is through innovation. Hence in the setting of effective enforcement, these asymmetries will lead to innovation as the only venue left to earn information rents.

First component in our index of institutional technologies is Risk reducing technologies. Increased risk divert resources from productive activities to protecting there rights. Hall and Jones (1999) showed quantitatively, how important these effects are. Productive activities are vulnerable to predation. As they put it, Social control of diversion has two benefits. First, in a society free of diversion, productive units are rewarded by the full amount of their production, and where there is diversion, on the other hand, it acts like a tax on output. Second, where social control of diversion is effective, individual units do not need to invest resources in avoiding diversion. In many cases, social control is much

cheaper than private avoidance. Social control act as a threat of punishment, which itself is free and the only resources required are those needed to make this threat credible. In other word social control does not means collectively hiring guards by society proves to be cheaper. Magee, Brock and Young (1989) and Murphy Shleifer and Vishny (1991) explain how inadequate controls affect growth.

Our index of risk reducing technologies covers the institutions pertaining to property rights, law and order, and policy stability. Among all these, property rights and contract enforcement is one of the most elaborated topics in institutional literature. Few studies are touched here. Cozzi (2001) shows that better institutional quality – in the form of a tighter patent protection – increases both growth rate and inequality. The law and finance literature, pioneered by La Porta et al. (1997,1998), argues that institutions – property rights honouring government, investor and creditor rights, and efficient judicial enforcement – are critical to capital market development. Gould and Gruben (1996) and Kanwar and Evenson (2001) document a positive relation between property rights and growth or innovation. The two most important – core institutions for encouraging entrepreneurship are well-defined property rights and the rule of law. It is well established that those countries where these core institutions are developed have a record of strong economic growth (Boettke and Subrick, 2002; Gwartney et al., 1998, 1999; Scully, 1988).

One of the most important institutional arrangement in security of property rights and contract enforcement are proper judicial system. If the courts are slow, inefficient, then corrupt informal contract enforcement appears as a solution to court failures (Johnson et al., 2002; Macaulay, 1963; Galanter, 1981 and Ellickson, 1991).

Another important measure of risk reducing technologies is policy stability which is linked with political stability (Olson, 1993; Londregan and Poole, 1990) have shown that political violence affects the economic performance Alesina, Ozler, Roubini and Swagel (1992) shows the political instability leads to slower growth.

Second and perhaps more important measure of institutional quality is index of anti-rent seeking technologies. As shown earlier, the rent-seeking (behaviour) refers to – the socially costly pursuit of wealth transfers (Tollison, 1997). In other words, rent-seeking is manifested when the bottom-line of its social consequences is negative.

Mehlum et al. (2003) explains the notion of destructive creations asserts that it all starts from the breakdown of institutions, generating new opportunities of extracting rents without producing. A vast literature can be found linking entrepreneurship, rent seeking and growth (Murphy et al., 1991; Baumol, 1990, 1993; Acemoglu, 1995; Acemoglu and Verdier, 1998). Rents can be divided into the institutional rents, which cover institutions related to regulatory quality, corruption, and ease of doing business. There is a dearth of literature linking regulatory quality and growth, most of them proves a point that excessive laws and regulations are the more general problem. Djankov et al. (2002) document the number of regulatory hurdles on the path to establishing a small business in 85 countries. The empirical analyses prove that bad bureaucratic quality harms both the growth

performance and productivity of both developed and developing countries (Lamsdorff, 2004; Sarte, 2001; Chong and Calderon, 2000; Grigorian and Martinez, 2001 and Rodrik, 1997).

Corruption is yet another form of rent seeking which can be dealt by proper institutional framework. Vast number of studies done on this topic. Gupta et al. (2001) find that countries with high levels of corruption are associated with the lower quality public health care and education.

Wei (1997, 2000a and 2000b) calculates that a one standard deviation increase in host country corruption might be equivalent to an increase of about 30 percentage points in the tax rate in terms of its negative effect on economy.

Perhaps the most important institutions are political institutions. Institutional weakness leads to political rents which can be curbed through checks and balances on political agents Keefer (2004) and Keefer and Knack (2002). Various studies showed evidence supporting that political freedoms and civil liberties greatly influence growth and welfare (Kormendi and Meguire, 1985; Scully, 1988; McMillan et al., 1991).

3. Methodology and data collection

In this section we describe the indices, data sources and aggregation methodology.

3.1. Description of Indices

In this section we describe the computation of the following indices.

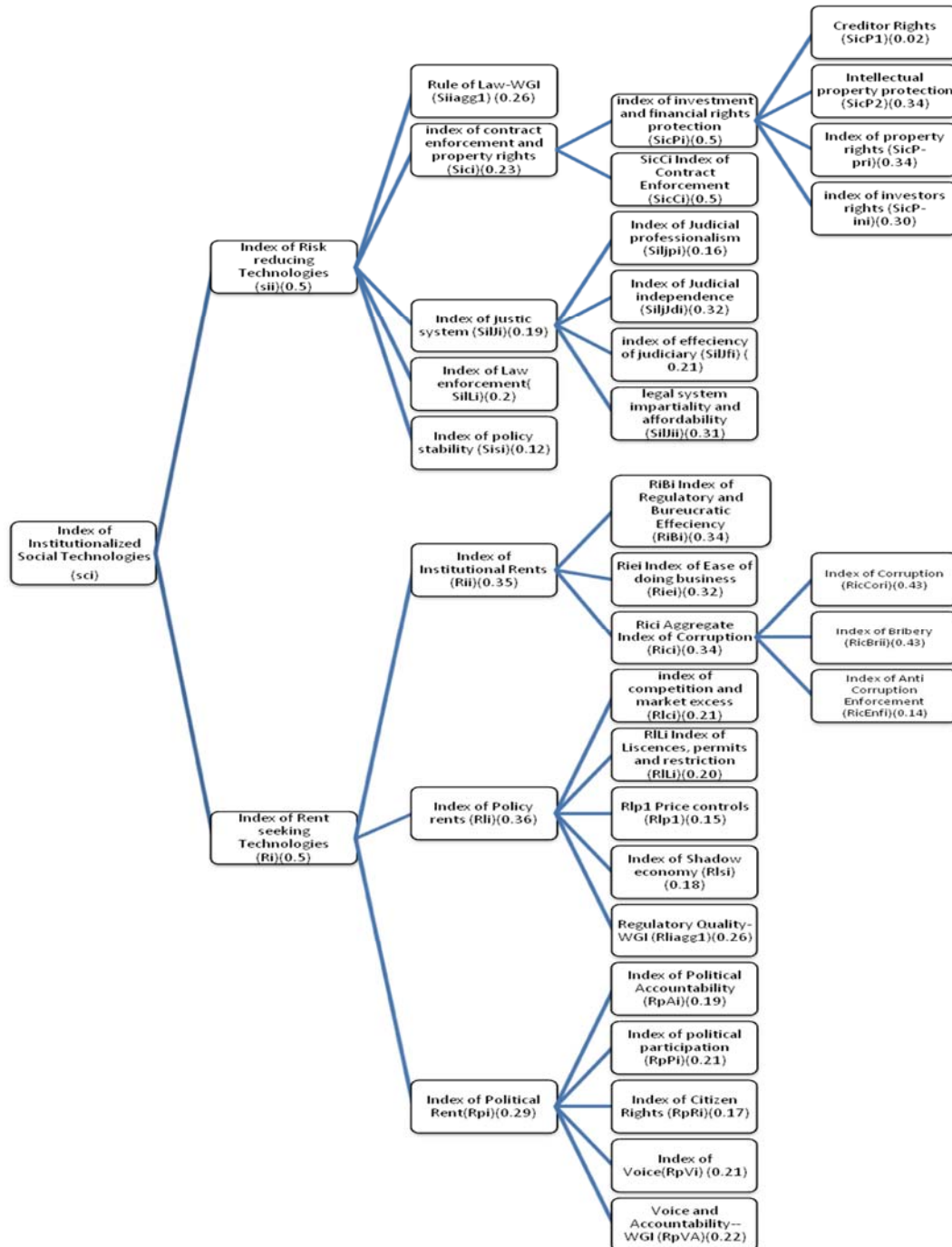
Index of institutionalized Social Technologies (sci-agg)

This index measures technologies that are bundle of information that consists of routines and processes imposed by society, which creates positive rents in the economy. This is an aggregate cross national index that encompasses the impact of all institutional performance indicators and mainly comprises of Index of Risk Reducing Technologies and the Index of Anti Rent seeking Technologies (See Figure 1).

1. Aggregate Index of Risk reducing Technologies (Sii-agg)

First component of institutionalized social technology is called risk reducing technology. It measures institutional arrangements that reduce transactional risk. A biased or ineffective justice system makes property rights insecure for all except those who have power to secure it privately. As a result returns to investment for those people would be considerably more than the rest who bears higher risk due to insecurity. As a result it will divert individuals and businesses from innovative activities to become predictive rent seekers. Risk reducing technology removes information asymmetry, creates mutual trust and hence decreases the risk of creating long term business relationships. This intern increase productivity and growth. Index of risk reducing technologies further divided into following indices.

Figure 1. Hierarchical Distribution of Indices



Legend: Index name is displayed in each box, followed by Abbreviation (First Bracket) and its weights in parent index (Second Bracket).

Source: Authors' own work.

a) Contract enforcement and property rights b) Justice system c) Law enforcement d) Policy stability and e). Rule of law index of world governance indicators. Their weights in risk reducing technology index are 23%, 19%, 20%, 12% and 26% respectively. Different sub components of the index of risk reducing technology are briefly elaborate below

1.1. Index of contract enforcement and property rights (Sici):

This Index of contract enforcement and property rights made up a) Index of Contract Enforcement and b) Index of investment and financial rights protection

1.1.1. Index of Contract Enforcement: This index captures indicators enforcement cost and time spend by businesses, public confidence in legal system, Contract enforcement ranking of different surveys.

1.1.2. Index of investment and financial rights protection: This index covers indicators of creditors' rights protection, intellectual property rights protection, investors' rights index and index of property rights with weights of 2%, 34%, 30% and 34% respectively.

1.1.2.1. Index of property rights: this sub index of index of investment and financial rights protection include indicators from different sources namely economic freedom of World, World economic forum and Heritage foundation.

1.1.2.2. Index of investors rights: This sub index covers indicators pertaining to protection of minority shareholders' interest as well as general investors protection. Each assigned equal weights

1.2. Index of justice system (SilJi):

This comprehensive index of justice system measures judicial professionalism, independence, efficiency and impartiality and affordability. Specifically it is sub divided into: a) Index of Judicial professionalism; b) Index of Judicial independence c); index of efficiency of judiciary and d) legal system impartiality and affordability with weights of 16%, 32%, 21% and 31%, respectively. These are further explained below:

1.2.1. Index of Judicial professionalism: This covers numbers of procedural action required until the enforcement of judgement.

1.2.2. Index of Judicial independence: This aggregates different judicial independence measures from different sources.

1.2.3. Index of efficiency of judiciary: This index includes different judicial efficiency measures along with people access of justice and duration from lodging a complain to enforcement of verdict.

1.2.4. Legal system impartiality and affordability: This sub index aggregates different indicators obtain from surveys of individual and business regarding impartiality of courts, equality of citizens under law and access of Citizens to a Non-discriminatory Judiciary, irregular payments made for favourable judicial decision, justice affordability, consistency, and honesty of legal system.

1.3. Index of Law Enforcement (SilLi):

Proper judicial system should be aided with effective law enforcement mechanism for proper enforcement of property rights. This comprehensive index covers various fascist of law enforcement notably a) Theft losses; b) Tax evasion; c) Risk of confiscation; d) Organized crime; e) Reliability and professionalism of police and other law enforcement services; f) Business costs of crime and violence and g) Torture, Extrajudicial Killing,

Political Imprisonment, and Disappearance indicators. All these indicators are weighted equally.

1.4. Index of policy stability(sisi):

Issue of policy instability mainly arise because of instable political institutions. This component of risk reducing technology is covers issues such as 1. Executive Constraints 2. Military interference in rule of law and the political process and 3.Stability of Democratic Institutions, are focused in this index. All are weighted equally in the index.

2. Index of Anti-Rent seeking Technologies (Ri)

Predatory rents can be gained through weak institutionalization of risk reducing technologies that create loopholes in ineffective or week institutions. Rent-seeking is defined as a situation in which an individual or firm makes money by manipulating economic environment rather than by profit making through innovation. This index focuses on technologies which helps eliminate three kinds of rent. Accordingly it is subdivided into three indices namely index of Institutional rents, index of Policy rents and index of Political with weight of 35%, 36% and 29% respectively. Brief descriptions of different sub-indices are given as under.

2.1. Index of Institutional Rents (Rii):

This index exclusively focuses on those rents that arise due to weak institutions. This index providing detail coverage of different institutional weakness specially focuses on a) Regulatory and Bureaucratic Efficiency b) Ease of doing business and c) Corruption, with weights of 34%, 32% and 34% respectively. Summary account of each is given below.

2.1.1. Regulatory and Bureaucratic Efficiency: As noted earlier, effective institutions can only by enforced through government and the government implements governance through the machinery of Bureaucracy. Hence quality of bureaucracy can determine quality of their institutions. This index focus to measures this quality, in terms of bureaucracy costs and hindrance to business, favouritism in decisions of government officials, and burden of government regulation.

2.1.2. Ease of doing business: This index focuses all those institutional impediments that prevent smooth functioning of businesses. Specifically this index focuses in Time (days), Cost (% of income per capita), the number of procedures and other regulatory burden in businesses.

2.1.3. Corruption: This index exclusively focuses on the predatory rents extracted by agent in office of power. As remarked by Sarte (2001) – In economies where rent-seeking is a generally accepted way of life, one might expect oversight to be difficult. In essence, substantial resources would have to be spent to monitor a bureaucracy that is deeply entrenched in a culture of corruption. This index is further subdivided into a) Index of Corruption, b) Index of Bribery and c) Index of Anti Corruption Enforcement, with weights of 43%, 43% and 14% respectively. There details are given below.

2.1.3.1. Index of Corruption: This consists of indicators measuring control of corruption from different sources like World Governance Indicators, BERI, PRS and Transparency International.

2.1.3.2. Index of Bribery: This index exclusively focuses on indicators measuring extent of bribes or extra payment given to officials to get their work done by business and individuals. All subcomponents are weighted equally.

2.1.3.3. Index of Anti Corruption Enforcement: This focuses on capacity of state organs to enforce Anti corruption measures these pertain to law as well as enforcement agencies.

2.2. Aggregate Index of Policy rents (Rli-agg):

There are also rents that arise when government follows protectionist policy creating inefficiencies by protecting inefficient businesses. Whatever might be the reason, the common view treats these rents as bad as institutional rents or even worse. This index is subdivided into a) Index of competition and market excess b) Index of Licences, permits and restriction c) Price controls d) Index of Shadow economy and Index of Regulatory quality taken from world governance indicators with weights of 21%, 20%, 15%, 18% and 26% respectively. Further details are given below.

2.2.1. Index of competition and market excess: This index covers Freedom of Private Businesses and Cooperatives to Compete in Markets, Intensity of local competition, Extent of market dominance by few players, extent of market liberalization and government owned businesses in markets. All sub components are weighted equally.

2.2.2. Index of Licences, permits and restriction: This sub index of policy rent aggregates indicators measuring administrative requirements business have to fulfil, which could include reporting requirements, as well as regulatory restriction in obtaining licences, construction permits, or sale of real property. It also includes Land inequality as it indicates policies favouring elites. All variables in index are weighted equally.

2.2.3. Index of Shadow economy: This component of policy rents indicates extent of informal economy. Informal or shadow sector normally thrives when there are too much compliance and regulatory hindrances that deter small businesses and start-ups. As a result they prefer to go unreported and parallel economy emerges. This index aggregates shadow economy indicators, assigning equal weights to all.

2.3. Index of Political Rent (Rpi):

This index measures the extent of power given by institutions to political authorities. Power without accountability and checks would create conflict of interest between political authorities and their constituencies. This index is further divided into 1. Index of Political Accountability 2. Index of political participation and competitiveness 3. Index of Citizen Rights and 4. Index of Voice. With weights of about 19%, 21%, 17% and 21% respectively, while weight of 22% is given to Voice and accountability index of world governance indicator.

2.3.1. Index of Political Accountability: This index covers different aspects of public accountability. Specifically it covers possibility that law provides to hold top government offices and ministers accountable for their actions. It also measures extent of public disclosure and accountability of parliamentarians and whether court can undertake judicial review of legislations. It also measures effectiveness of the offices of ombudsman, auditor general or other public accountability agency. All indicators are given equal weights.

2.3.2. Index of political participation and competitiveness: This index measures the extent of political competitiveness, rules governing chief executive recruiting and elections, level playing field provided to political participants, fairness and impartiality of electoral

processes and freedom to engage in political activities. All subcomponents are weighted equally.

2.3.3. Index of Citizen Rights: This index measures extent of freedom provides to civil society organisations, and citizen access to government information and basic government records with reasonably time period. All subcomponents are weighted equally.

2.3.4. Index of Voice: This index measures freedom of media and press as well as freedom of citizens to voice their concerns. Civil liberties media and press freedom are weighted 35%, 30% and 35%, respectively.

Figurative description of these indices is provided in Figure 1, whereas description of sub-indices are provided in Table 1. Detail description of their data sources are included in appendixes A and B, which can be provided upon request.

Table 1. Description of sub-indices

Sub-indices	Extracted Factors	Components		
		Abbreviation	Name	Weights in Sub index
Index of Regulatory and Bureaucratic Efficiency (RiBi)		RiB1	Bureaucracy costs	0.14
		RiB2	Bureaucracy Hindrance to Business	0.12
		RiB3	Favoritism in decisions of government officials	0.15
		RiB4	Burden of government regulation	0.11
		RiB5	Government Effectiveness-ICRG	0.15
		RiB6	Government Effectiveness-BERI	0.16
		RiB7	Government Effectiveness-WGI	0.17
Index of Ease of doing business (Riei)	F1	Rie2	Starting a business-EFW	0.15
		Rie3	Starting a Business-doing business index-Rank	0.14
		Rie4	Starting a Business-doing business index-Time (days)	0.17
		Rie8	Regulatory Quality-ICRG	0.08
	F2	Rie1	Business Freedom-HI	0.09
		Rie5	Starting a Business-doing business index-Cost (% of income per capita)	0.12
		Rie6	regulation of entry-The number of procedures	0.05
Rie7	regulation of entry-cost+time as share of per capita GDP	0.19		
Index of Bribery (RicBrii)	F1	RicBri1	bribe-Enterprise Survey	0.23
		RicBri2	Extra payments/bribes-EFW	0.09
		RicBri5	Bribery-Enterprise Survey	0.23
	F2	RicBri3	Bribery(FJKZ)	0.23
		RicBri4	Exporter Bribery Index	0.23
Index of Corruption (RicCori)		RicCor1	corruption-Enterprise Survey	0.07
		RicCor2	Corruption-	0.13
		RicCor3	Public Sector Ethics Index(PSEI)	0.12
		RicCor4	Corruption-LLSV	0.10
		RicCor5	Control of Corruption-ICRG	0.11
		RicCor6	Control of Corruption-BERI	0.10
		RicCor7	TI-Corruption Presception Index	0.13
		RicCor8	Corporate Ethics Index	0.11
		RicCor9	Control of Corruption-WGI	0.13
Index of Anti Corruption Enforcement (RicEnfi)		RicEnf1	Anti-Corruption Law	0.50
		RicEnf2	Anti-Corruption Agency	0.5

Sub-indices	Extracted Factors	Components		
		Abbreviation	Name	Weights in Sub index
index of competition and market excess (Rlc)	F1	Rlc1	Type of Economic Organization	0.11
		Rlc3	Intensity of local competition	0.25
		Rlc4	Extent of market dominance	0.23
	F2	Rlc2	Freedom of Private Businesses and Cooperatives to Compete in Markets	0.27
		Rlc5	Market Organization-bertelsmann	0.14
Index of Liscences, permits and restriction (Rli)	F1	Ril3	Regulatory restrictions on the sale of real property	0.09
		Ril4	Licensing restrictions	0.16
		Ril5	Dealing with Construction Permits-Rank	0.16
		Ril7	GINLand inequality	0.14
	F2	Ril1	Administrative requirements-EFW	0.17
		Ril2	Administrative requirements-enterprise survey	0.08
Index of Shadow economy (Rls)	F1	Rls1	informal sector	0.09
		Rls2	shadow economy as % of GDP-Schnider	0.29
		Rls4	Unofficial Economy-FJKZ	0.29
	F2	Rls3	black market premium	0.32
	Index of Political Accountability (RpAi)		RpA1	Executive Accountability
		RpA2	Legislative Accountability	0.29
		RpA3	National Ombudsman	0.16
		RpA4	Supreme Audit Institution	0.27
Index of political participation and competitiveness (RpPi)		RpP1	executive recruitment	0.23
		RpP2	Political Competition	0.24
		RpP3	Political Participation	0.26
		RpP4	Political Right	0.27
Index of Citizen Rights (RpRi)		RpR1	Civil Society Organizations	0.50
		RpR2	Public Access to Information	0.50
Index of Voice (RpVi)		RpV1	Media Freedom	0.30
		RpV2	Civil Liberties	0.35
		RpV3	press freedom index-Rank	0.35
Index of Contract Enforcement (SicCi)	F1	SicC1	Legal enforcement of contracts	0.19
		SicC2	Enforcing Contracts-Rank-doing bussiness	0.21
		SicC3	Enforcing Contracts-Time (days)-doing bussiness	0.18
		SicC4	Enforcing Contracts-Cost (% of claim)-doing bussiness	0.16
	F2	SicC5	Contract enforceability-BERI	0.05
		SicC6	Confidence in legal system	0.21
index of investors rights (SicP-ini)		SicPin1	Investor rights index-ZK	0.38
		SicPin2	Protection of minority shareholders' interests	0.38
		SicPin3	Investor (minority stake) Protection Index	0.24
Index of property rights (SicP-pri)		SicPpr1	Protection of property rights -EFW	0.25
		SicPpr2	Property rights-WEF	0.30
		SicPpr3	Property Rights-HF	0.26
		SicPpr4	Private Property-BTI	0.19
Index of Judicial independence (SilJdi)		SilJd1	Judicial independence-EFW	0.43
		SilJd2	Judicial independence-WEF	0.43
		SilJd3	Judicial independence-LLPS	0.14

Sub-indices	Extracted Factors	Components		
		Abbreviation	Name	Weights in Sub index
index of efficiency of judiciary (SiJfi)	F1	SiJf1	Efficiency of Judiciary-LLSV	0.22
		SiJf2	Efficiency of legal framework-WEF	0.25
		SiJf8	index mandatory time limits	0.18
	F2	SiJf6	Assess to justic index	0.21
		siJf7	Total Duration	0.14
legal system impartiality and affordability (SiJii)	F1	SiJi2	Impartial courts-EFW	0.16
		SiJi4	Irregular payments in judicial decision	0.16
		SiJi5	Legal system is affordable	0.10
		SiJi6	Legal system is consistent	0.16
		SiJi7	Legal system is honest and uncorrupt	0.16
	F2	SiJi1	judicial system-Enterprise Survey	0.12
		SiJi3	Equality of Citizens Under the Law and Access of Citizens to a Non-discriminatory Judiciary	0.14
Index of Judicial professionalism (SiJpi)		SiJp2	Index Judges and Lawyers	0.50
		SiJp1	Independent procedural actions	0.50
Index of Law enforcement (SiLi)	F1	SiL3	tax evasion	0.12
		SiL4	risk of confiscation	0.06
		SiL6	Reliability of police services	0.06
		SiL8	police-Law Enforcement	0.09
		SiL9	Physical Integrity Rights Index	0.11
	F2	SiL5	Organized crime	0.13
		SiL7	Business costs of crime and violence	0.16
	F3	SiL1	theft losses-Enterprise Survey	0.15
		SiL2	theft-Enterprise Survey	0.12
Index of policy stability (Sisi)		Sis1	Executive Constraints	0.38
		Sis2	Military interference in rule of law and the political process	0.21
		Sis3	Stability of Democratic Institutions	0.41

3.2. Data sources and description

Our index covers 141 countries, covering almost entire world population. We employ more than 100 data sources pertaining to these countries in the construction of index. However data sources vary from country to country. Few country like Columbia or Mexico, having extensive coverage, have 110 data source each, whereas countries such as Myanmar, North Korea or Cuba have comparatively few sources of 19, 21 and 22 respectively. Our index is made up of 141 variables including indices, covering wide range of institutional measures. For some variables we have data for 141 countries and for other less and minimum 32 this makes total of 14,696 data points in the index. A point to note that this index provide a measure to judge the level of countries' institutional development, which might require more than one time performance. There is also issue of data availability of different variables as to some data sources, only few observation of different time period can be gathered. Therefore for majority of variables in index, we take their value as average of 10 to 12 years of recent past. Most of our variables are averages from 1995 to 2008. Some variables have only single observations but most of them belong to recent past, not earlier than 2000. Detail of timing coverage on each variable is shown in appendix A. Moreover institutional variables rarely change over the years. As Kaufmann et al. (2008), indicates

these changes are relatively small, and depict considerably high correlation between current and lagged estimates. Even if some variable significantly change over time, its effect in aggregate index would not be much and would not produce any significant effect in the short run analysis.

3.3. Aggregation methodology

3.3.1. Normalization Procedure

Because of different measuring scales used in different variables, to include them in index, we use normalization treatment thereby converting each variable to an index with a zero to one scale, where higher values denote more strong institutions. When higher values of the original variable indicate weak institutions (like country ranks), the formula $(V_{max}-V_i) / (V_{max}-V_{min})$ is used for transformation. Conversely, when higher values indicate strong institutions, the formula $(V_i-V_{min}) / (V_{max}-V_{min})$ is used. Here V_i = original values, V_{max} = Maximum value attained by country in original index, V_{min} = Minimum value attained by country in original index. Similar strategy is being employed in creation of various indices notably Gwartney and Lawson (2008), Miller and Holmes (2009) and Schwab and Porter (2008).

3.3.2. Treatment of outliers

Few variables had value that varies widely in the original set. E.g. Number of days required for contract enforcement, which may go up to 1700 days. For these variables the maximum range (V_{max}) is set at 1.25 standard deviations above average and countries with values outside of the V_{max} receives ratings equivalent to highest value of the country which is inside the range.

3.3.3. Weighting and aggregation methodology.

Principal component analysis is used to determine the weight given to each component in the construction of the index. This procedure partitions the variance of a set of variables and uses it to determine the linear combination – the weights – of these variables that maximizes the variation of the newly constructed principal component. In effect, the newly constructed principal component is the variable that captures the variation of the underlying components most fully. It is an objective method of combining a set of variables into a single variable that best reflects the original data. As Gwartney and Lawson (2001: 7) point out, this procedure is particularly appropriate when several sub-components measure different aspects of a principal component. The component weights derived by this procedure are shown in parentheses in Figure 1. The same procedure was also used to derive the weights for the sub-indices that are used in the construction of main indices referred in Figure 1.

More specifically first, principal components analysis is used to extract factors (Manly, 1994). We choose factors that fulfil these considerations: (i) have associated eigenvalues larger than one; (ii) contribute individually to the explanation of overall variance by more than 10%; and (iii) contribute cumulatively to the explanation of the overall variance by more than 60%. Details of extracted factors of 10 major indices are provided in Table 2.

Table 2. Factor Extraction and Rotation of 10 major indices based on Principal Component Analysis

No.	Indices	Extracted Factors	Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
			Eigen values	% of Variance	Cumulative %	Eigen values	% of Variance	Cumulative %
1	SiiLi	1	4.954828	55.053643	55.05364	2.796594	31.07327	31.07327
		2	1.357936	15.088176	70.14182	2.376991	26.41101	57.48428
		3	1.219172	13.546353	83.68817	2.35835	26.20389	83.68817
2	Sisi	1	2.103962	70.132053	70.13205			
3	Rli	1	3.502067	70.041346	70.04135			
4	Rpi	1	4.134938	82.698769	82.69877			
5	Sici	1	1.535679	76.783951	76.78395			
6	SiiJi	1	2.793826	69.845645	69.84564			
7	Rii	1	2.620346	87.344864	87.34486			
8	Ri	1	2.520509	84.016956	84.01696			
9	Sii	1	3.674667	73.49333	73.49333			
10	sci (IIST)	1	1.939657	96.982833	96.98283			

These factors are then rotated in order to minimise the number of individual indicators that have a high loading on the same factor. The idea behind transforming the factorial axes is to obtain a – simpler structure of the factors. Rotation is a standard step in factor analysis – it changes the factor loadings and hence the interpretation of the factors, while leaving unchanged the analytical solutions obtained *ex ante* and *ex post* the rotation. Weights are then calculated through the square of factor loadings after rotation which represents the proportion of the total unit variance of the indicator which is explained by the factor. Similar approach is used by Nicoletti et al. (2000) that is of grouping the individual components with the highest factors loadings into intermediate Factor. These Factors aggregated by assigning a weight to each one of them equal to the proportion of the explained variance in the data set. The components of extracted and rotated factors along with component weights of 10 major indices are given in Table 3. For Aggregation, we employ linear aggregation which is the summation of weighted and normalised individual indicators:

Table 3. Extracted Factor loadings and weights of 10 major indices

No.	Indices	Compo nents	Rotated Factor loadings			Squared Factor loadings			Squared Factor loadin (Scaled to unity)			Weights	Weights (Scaled to unity)
			1	2	3	1	2	3	1	2	3		
1	SiiLi	SiiL1	0.227	0.067	0.927	0.051	0.005	0.859	0.018	0.002	0.364	0.114	0.15
		SiiL2	0.085	0.394	0.847	0.007	0.155	0.717	0.003	0.065	0.304	0.095	0.12
		SiiL3	0.843	-0.057	0.419	0.711	0.003	0.176	0.254	0.001	0.075	0.094	0.12
		SiiL4	0.601	0.376	0.498	0.361	0.142	0.248	0.129	0.060	0.105	0.048	0.06
		SiiL5	0.406	0.872	0.089	0.165	0.760	0.008	0.059	0.320	0.003	0.101	0.13
		SiiL6	0.588	0.516	0.358	0.345	0.266	0.128	0.123	0.112	0.054	0.046	0.06
		SiiL7	0.062	0.950	0.262	0.004	0.903	0.069	0.001	0.380	0.029	0.120	0.16
		SiiL8	0.722	0.240	0.298	0.521	0.058	0.089	0.186	0.024	0.038	0.069	0.09
		SiiL9	0.794	0.291	-0.255	0.631	0.085	0.065	0.226	0.036	0.028	0.084	0.11
		Sum					2.797	2.377	2.358				0.771
	Factor Weights				0.371	0.316	0.313						

Extracted Factor loadings and weights (continued)

No.	Indices	Components	Extracted Factor loadings	Squared Factor loadings	Squared Factor loadings Scaled to unity	Weights
2	Sisi	Sis1	0.89892	0.8080576	0.384065	0.38
		Sis2	0.664208	0.4411727	0.209687	0.21
		Sis3	0.924517	0.8547313	0.406249	0.41
		Sum		2.1039616		
3	Rli	Rliagg1	0.951899	0.9061125	0.258736	0.26
		Rlci	0.858977	0.737842	0.210688	0.21
		RliLi	0.836671	0.7000182	0.199887	0.2
		Rlp1	0.73273	0.5368937	0.153308	0.15
		Rlsi	0.788163	0.6212009	0.177381	0.18
		Sum		3.5020673		
4	Rpi	RpAi	0.878761	0.7722211	0.186755	0.19
		RpPi	0.926747	0.8588602	0.207708	0.21
		RpRi	0.852119	0.7261073	0.175603	0.17
		RpVi	0.931018	0.8667947	0.209627	0.21
		RpVA1	0.95444	0.9109552	0.220307	0.22
		Sum		4.1349384		
5	Sici	SicCi	0.876265	0.7678395	0.5	0.5
		SicPi	0.876265	0.7678395	0.5	0.5
		Sum		1.535679		
6	SilJi	Siljpi	-0.65831	0.4333758	0.155119	0.16
		Siljdi	0.94514	0.8932896	0.319737	0.32
		SilJfi	0.769648	0.5923574	0.212024	0.21
		SilJii	0.935309	0.8748031	0.31312	0.31
		Sum		2.7938258		
7	Rii	RiBi	0.949658	0.9018507	0.344172	0.34
		Riei	0.910179	0.8284267	0.316152	0.32
		Rici	0.943434	0.8900686	0.339676	0.34
		Sum		2.6203459		
8	Ri	Rii	0.941688	0.8867758	0.351824	0.35
		Rli	0.951529	0.9054068	0.359216	0.36
		Rpi	0.85342	0.7283261	0.28896	0.29
		Sum		2.5205087		
9	Sii	Siiagg1	0.969809	0.9405291	0.25595	0.26
		Sici	0.924976	0.8555812	0.232832	0.23
		SilJi	0.841383	0.7079248	0.19265	0.19
		SilLi	0.850475	0.723308	0.196836	0.2
		Sisi	0.668822	0.4473233	0.121732	0.12
		Sum		3.6746665		
10	sci (IST)	sii	0.984799	0.9698283	0.5	0.5
		ri	0.984799	0.9698283	0.5	0.5
		Sum		1.9396567		

3.3.4. Treatment of missing data

We also employ in our analysis dynamic weighing thereby removing the effect of unavailable data from index. There might be instances where country values are not available for a certain variable. Our dynamic weighting regime removes value from the index calculations when no data are present in certain variable for a certain country. Then the variable weight is spread among others remaining variables -for which data are present in proportion to their ratio of their respective weights divided by sum of all remaining weights. Similar weighting regime is also employed in Schwab and Porter (2008) for their construction of world competitive index

4. Results and comparisons

This section reports index of institutionalized social technologies and its sub-indices. Ten major indices are provided as depicted from Table 4, other sub-indices can be made available upon request. We have also undertaken exercise of comparing our index of Institutionalized social technology with other indices. Many indices are available in literature covering various issues of development but to our knowledge no published index exists that cover more or less the same variables that are covered in our index.

For the purpose of comparison, we have selected seven indices that can said to be partially related to our index (see Figure 2). These are:

- 1) Status Index 2006, Bertelsmann Transformation Index (BTI), Bertelsmann Foundation, Berlin, Germany, www.bertelsmann-stiftung.de;
- 2) Average Country Ranking (1996-2006), Economic Freedom of the World, Economic Freedom Network, Fraser Institute;
- 3) Average Overall Country Score (1995-2009), Index of Economic Freedom, The heritage Foundation and Dow Jones and Company, Inc.;
- 4) Institutions Score, Global Competitive Report 2007-08, World Economic Forum;
- 5) Average Country Score (2004-08), Global integrity index, Global Integrity Report www.globalintegrity.org;
- 6) Country risk rankings, euromoney <www.euromoney.com> and
- 7) Democracy Rank, World audit, World Concern, England <www.worldaudit.org>.

For comparison, we carry out Spearman's Rank Correlation focusing on ordinal information as well as Pearson correlation focusing on the interval between observations. The results show our indexes have a high degree of correlation among all and all coefficients are also highly significant.

Table 4. *The Index of Institutionalized Social Technology and its sub-indices (sorted by Rank)*

Rank	Countries	Institutionalized Social Technologies (sci)	Index of Institutionalized Social Technologies (sci)			Index of Anti Rent seeking Technologies (Ri)			Index of Risk reducing Technologies (Sii)		
			Anti Rent seeking Technologies (Ri)	Risk reducing Technologies (Sii)	Institutional Rents (Rii)	Policy rents (Rli)	Political Rent (Rpi)	Contract Enforcement and Property Rights (Sici)	Justice System (SiJi)	Law Enforcement (SiLi)	Policy Stability (Sisi)
1	FINLAND	0.9336	0.9295	0.9377	0.9311	0.8738	0.9966	0.9159	0.8345	0.9727	0.9999
2	DENMARK	0.9287	0.9280	0.9295	0.9236	0.8804	0.9922	0.8967	0.8257	0.9630	0.9987
3	ICELAND	0.9173	0.9077	0.9269	0.9372	0.8128	0.9900	0.9108	0.7644	0.9875	0.9951
4	SWITZERLAND	0.9129	0.9077	0.9180	0.8897	0.8637	0.9840	0.8728	0.8078	0.9201	0.9999
5	NEW ZEALAND	0.9120	0.9177	0.9064	0.9228	0.8564	0.9875	0.9295	0.7374	0.8996	0.9999
6	NORWAY	0.9081	0.8864	0.9298	0.8862	0.7992	0.9950	0.9029	0.7789	0.9817	0.9999
7	SWEDEN	0.8934	0.9056	0.8813	0.8915	0.8543	0.9861	0.8034	0.8003	0.8769	0.9850
8	NETHERLANDS	0.8857	0.8903	0.8812	0.8694	0.8276	0.9932	0.8486	0.8148	0.8281	0.9999
9	AUSTRIA	0.8827	0.8595	0.9059	0.7907	0.8437	0.9622	0.8856	0.7810	0.9143	0.9997
10	LUXEMBOURG	0.8765	0.8517	0.9013	0.8436	0.7493	0.9887	0.8961	0.7152	0.9376	0.9999
11	AUSTRALIA	0.8725	0.8662	0.8789	0.8528	0.8233	0.9356	0.8536	0.7460	0.8707	0.9975
12	GERMANY	0.8635	0.8464	0.8807	0.7893	0.8430	0.9194	0.8620	0.7164	0.9129	0.9990
13	IRELAND	0.8629	0.8629	0.8628	0.8238	0.8116	0.9738	0.8049	0.7680	0.8679	0.9999
14	UNITED KINGDOM	0.8551	0.8763	0.8339	0.8696	0.8330	0.9380	0.8443	0.7206	0.6937	0.9943
15	CANADA	0.8511	0.8653	0.8370	0.8648	0.8264	0.9140	0.8043	0.6622	0.7982	0.9956
16	UNITED STATES	0.8372	0.8725	0.8020	0.8395	0.8907	0.8897	0.8520	0.5906	0.7306	0.9309
17	BELGIUM	0.8292	0.8132	0.8452	0.7624	0.7483	0.9550	0.8401	0.6977	0.8651	0.9931
18	HONG KONG	0.8223	0.8142	0.8304	0.8511	0.8752	0.6940	0.9273	0.7250	0.9226	0.6717
19	SINGAPORE	0.8042	0.7755	0.8329	0.9490	0.8969	0.4154	0.9606	0.7614	0.9099	0.3690
20	JAPAN	0.8040	0.7958	0.8122	0.7532	0.7918	0.8523	0.8240	0.6738	0.7718	0.9755
21	ESTONIA	0.7875	0.8033	0.7716	0.7455	0.8034	0.8731	0.7844	0.6688	0.8276	0.9651
22	FRANCE	0.7781	0.7932	0.7630	0.7506	0.7837	0.8564	0.7586	0.5827	0.7816	0.8377
23	CYPRUS	0.7651	0.7558	0.7743	0.7017	0.6762	0.9200	0.7563	0.6507	0.8673	0.9361
24	CHILE	0.7623	0.7845	0.7401	0.7269	0.8169	0.8137	0.6959	0.5841	0.7486	0.9121
25	BAHAMAS	0.7610	0.7594	0.7626	0.7605	0.6152	0.9371	0.6688	0.6557	0.7877	0.9659
26	PORTUGAL	0.7536	0.7532	0.7541	0.6902	0.6724	0.9295	0.6187	0.6173	0.8372	0.9998
27	SPAIN	0.7507	0.7580	0.7434	0.6622	0.7420	0.8934	0.6719	0.5202	0.8210	0.9384
28	MALTA	0.7414	0.6901	0.7927	0.6310	0.5392	0.9487	0.7397	0.5523	0.9216	0.9623
29	HUNGARY	0.7393	0.7382	0.7405	0.6263	0.7128	0.9048	0.7639	0.5465	0.7879	0.9761

Rank	Countries	Institutionalized Social Technologies (sci)	Index of Institutionalized Social Technologies (sci)			Index of Anti Rent seeking Technologies (Ri)			Index of Risk reducing Technologies (Sii)		
			Anti Rent seeking Technologies (Ri)	Risk reducing Technologies (Sii)	Institutional Rents (Rii)	Policy rents (Ri)	Political Rent (Rpi)	Contract Enforcement and Property Rights (Sici)	Justice System (SiIji)	Law Enforcement (SiLi)	Policy Stability (Sisi)
30	TAIWAN	0.7354	0.7618	0.7089	0.7016	0.7499	0.8494	0.6956	0.5609	0.7850	0.8136
31	ISRAEL	0.7275	0.7474	0.7076	0.7263	0.6781	0.8588	0.6684	0.7135	0.6420	0.8187
32	SLOVENIA	0.7205	0.7424	0.6986	0.6963	0.6408	0.9242	0.5772	0.5010	0.8198	0.9467
33	KOREA, SOUTH	0.7158	0.7029	0.7288	0.6637	0.6503	0.8155	0.7930	0.5739	0.7829	0.8167
34	CZECH REPUBLIC	0.7080	0.7423	0.6736	0.6005	0.7521	0.9014	0.5897	0.4455	0.7586	0.9731
35	LATVIA	0.7024	0.7099	0.6949	0.6226	0.6766	0.8566	0.7644	0.4701	0.8050	0.8945
36	LITHUANIA	0.6985	0.7245	0.6725	0.6383	0.6939	0.8665	0.6869	0.4712	0.7401	0.9393
37	SLOVAKIA	0.6867	0.7200	0.6534	0.5873	0.7184	0.8820	0.6647	0.4129	0.7403	0.9574
38	SOUTH AFRICA	0.6819	0.7405	0.6232	0.6991	0.6844	0.8600	0.6725	0.6046	0.4843	0.9104
39	GREECE	0.6794	0.6812	0.6777	0.5219	0.6791	0.8758	0.5795	0.5108	0.7680	0.9161
40	URUGUAY	0.6776	0.6746	0.6806	0.6022	0.5717	0.8897	0.5967	0.6631	0.6699	0.9573
41	COSTA RICA	0.6759	0.7010	0.6509	0.5608	0.7053	0.8647	0.5242	0.6095	0.6155	0.9738
42	POLAND	0.6550	0.6799	0.6300	0.5596	0.6243	0.8941	0.5908	0.3792	0.6913	0.9733
43	ITALY	0.6540	0.6935	0.6144	0.5480	0.6710	0.8970	0.4613	0.4403	0.6241	0.9972
44	BOTSWANA	0.6504	0.6431	0.6578	0.6198	0.5412	0.7976	0.6207	0.5939	0.6367	0.8229
45	NAMIBIA	0.6424	0.6253	0.6594	0.5831	0.5841	0.7274	0.7213	0.6962	0.6137	0.7547
46	JORDAN	0.6279	0.6099	0.6460	0.6188	0.6667	0.5285	0.6188	0.6624	0.8740	0.3414
47	UNITED ARAB EMIRATES	0.6190	0.5854	0.6527	0.6999	0.7189	0.2815	0.6049	0.6096	0.8679	0.3020
48	THAILAND	0.6146	0.5931	0.6361	0.5683	0.5732	0.6477	0.7231	0.4917	0.6740	0.7600
49	MALAYSIA	0.6055	0.5921	0.6189	0.6616	0.6327	0.4578	0.7215	0.5926	0.6101	0.4090
50	QATAR	0.6050	0.5481	0.6619	0.6363	0.6890	0.2669	0.6508	0.7903	0.9163	0.0000
51	ROMANIA	0.6039	0.6219	0.5858	0.5539	0.5519	0.7911	0.5787	0.4321	0.7155	0.8427
52	KUWAIT	0.6024	0.5344	0.6704	0.5588	0.6285	0.3880	0.6747	0.5996	0.7868	0.5103
53	OMAN	0.6019	0.5182	0.6856	0.6727	0.6045	0.2244	0.6548	0.7206	0.8173	0.4056

Rank	Countries	Institutionalized Social Technologies (sci)	Index of Institutionalized Social Technologies (sci)			Index of Anti Rent seeking Technologies (Ri)			Index of Risk reducing Technologies (Sii)		
			Anti Rent seeking Technologies (Ri)	Risk reducing Technologies (Sii)	Institutional Rents (Rii)	Policy rents (Ri)	Political Rent (Rpi)	Contract Enforcement and Property Rights (Sici)	Justice System (SiIji)	Law Enforcement (SiLli)	Policy Stability (Sisi)
54	BULGARIA	0.6013	0.6477	0.5550	0.5496	0.5981	0.8277	0.5331	0.3668	0.6140	0.9171
55	PANAMA	0.5940	0.6301	0.5580	0.5903	0.5805	0.7396	0.5218	0.4366	0.6305	0.8290
56	JAMAICA	0.5931	0.6530	0.5332	0.6115	0.5655	0.8116	0.6015	0.4609	0.4253	0.9651
57	CROATIA	0.5922	0.5909	0.5936	0.5880	0.4964	0.7117	0.5882	0.3575	0.7616	0.8552
58	INDIA	0.5853	0.5844	0.5862	0.4834	0.5802	0.7116	0.4463	0.5951	0.6129	0.8517
59	TURKEY	0.5788	0.5901	0.5674	0.5624	0.6024	0.6083	0.5681	0.4746	0.5570	0.8138
60	BAHRAIN	0.5772	0.5429	0.6115	0.6634	0.6413	0.2755	0.6846	0.5074	0.7757	0.2167
61	GHANA	0.5750	0.5628	0.5872	0.5081	0.5037	0.7022	0.6144	0.5375	0.6891	0.6741
62	TRINIDAD AND TOBAGO	0.5661	0.6052	0.5270	0.5375	0.4826	0.8393	0.4999	0.4484	0.3488	0.9353
63	TUNISIA	0.5586	0.5286	0.5885	0.6756	0.5927	0.2717	0.6678	0.6123	0.7238	0.2411
64	MONGOLIA	0.5569	0.5851	0.5287	0.5362	0.5270	0.7163	0.6098	0.1694	0.5972	0.8559
65	BRUNEI	0.5464	0.4855	0.6073	0.5320	0.6327	0.2467	0.5396	0.5680	0.6792	
66	ARGENTINA	0.5368	0.5885	0.4852	0.5233	0.5152	0.7582	0.4732	0.3600	0.5209	0.7623
67	MEXICO	0.5362	0.5864	0.4859	0.5080	0.5824	0.6860	0.5258	0.4048	0.4588	0.7265
68	SENEGAL	0.5357	0.5249	0.5466	0.4897	0.5200	0.5733	0.5153	0.4235	0.7317	0.6570
69	SRI LANKA	0.5309	0.5517	0.5100	0.6022	0.5351	0.5115	0.5290	0.3772	0.5525	0.5573
70	MALI	0.5272	0.5267	0.5277	0.3643	0.5140	0.7386	0.4327	0.4898	0.6864	0.6799
71	BRAZIL	0.5257	0.5677	0.4837	0.4242	0.5855	0.7187	0.5198	0.3814	0.3986	0.7951
72	EL SALVADOR	0.5217	0.5962	0.4472	0.5079	0.5874	0.7136	0.5801	0.3473	0.3083	0.7032
73	PHILIPPINES	0.5183	0.5510	0.4856	0.4692	0.5134	0.6964	0.4574	0.4246	0.4963	0.7490
74	MALAWI	0.5181	0.5395	0.4967	0.4896	0.4999	0.6488	0.4111	0.5459	0.5421	0.6529
75	GUYANA	0.5146	0.5609	0.4684	0.5268	0.4336	0.7602	0.5039	0.3090	0.4852	0.7282
76	ARMENIA	0.5140	0.5135	0.5145	0.5584	0.4537	0.5336	0.6392	0.2645	0.7019	0.5743
77	MOROCCO	0.5135	0.4987	0.5283	0.6146	0.5109	0.3437	0.5371	0.4401	0.7288	0.3119

Rank	Countries	Institutionalized Social Technologies (sci)	Index of Institutionalized Social Technologies (sci)			Index of Anti Rent seeking Technologies (Ri)			Index of Risk reducing Technologies (Sii)		
			Anti Rent seeking Technologies (Ri)	Risk reducing Technologies (Sii)	Institutional Rents (Rii)	Policy rents (Ri)	Political Rent (Rpi)	Contract Enforcement and Property Rights (Sici)	Justice System (SiIji)	Law Enforcement (SiIli)	Policy Stability (Sisi)
78	MOLDOVA	0.5027	0.5044	0.5010	0.5083	0.4254	0.5976	0.6474	0.2088	0.6335	0.6794
79	LEBANON	0.5025	0.4943	0.5107	0.4600	0.5289	0.4928	0.5478	0.5498	0.3681	0.7405
80	COLOMBIA	0.5024	0.5619	0.4429	0.5094	0.6013	0.5765	0.3983	0.4679	0.4734	0.6360
81	MADAGASCAR	0.5004	0.5252	0.4756	0.5062	0.4320	0.6638	0.4809	0.3176	0.5578	0.6558
82	GAMBIA	0.4989	0.4395	0.5584	0.4764	0.4937	0.3277	0.6195	0.7387	0.6294	0.1410
83	DOMINICAN REPUBLIC	0.4969	0.5429	0.4509	0.4138	0.5241	0.7221	0.5060	0.3595	0.3901	0.6944
84	SAUDI ARABIA	0.4894	0.4493	0.5294	0.5435	0.6549	0.0805	0.5859	0.5981	0.6327	0.0000
85	ZAMBIA	0.4877	0.4595	0.5159	0.4973	0.3777	0.5154	0.5609	0.4853	0.5781	0.6507
86	UKRAINE	0.4855	0.4993	0.4718	0.4491	0.4218	0.6561	0.4655	0.3260	0.6507	0.6816
87	PAPUA NEW GUINEA	0.4840	0.5360	0.4319	0.4658	0.4671	0.7062	0.4080	0.2611	0.6266	0.6483
88	NICARAGUA	0.4837	0.5038	0.4636	0.4506	0.4309	0.6584	0.5323	0.1816	0.6373	0.7119
89	EGYPT	0.4824	0.4232	0.5416	0.5345	0.3960	0.3228	0.5108	0.5751	0.6887	0.3484
90	ALBANIA	0.4786	0.4908	0.4664	0.4352	0.4396	0.6214	0.5010	0.2794	0.6093	0.7472
91	KAZAKHSTAN	0.4758	0.4913	0.4602	0.5433	0.4777	0.4454	0.5759	0.4169	0.6619	0.2838
92	PERU	0.4745	0.5512	0.3978	0.4976	0.5522	0.6147	0.4011	0.3657	0.2813	0.6866
93	INDONESIA	0.4737	0.5142	0.4332	0.4394	0.5447	0.5667	0.3534	0.3533	0.6273	0.5804
94	SERBIA	0.4733	0.4795	0.4672	0.5032	0.3474	0.6147	0.4751	0.2929	0.6439	0.7553
95	BOLIVIA	0.4732	0.4909	0.4555	0.3216	0.4939	0.6915	0.3981	0.3183	0.5615	0.7380
96	HONDURAS	0.4706	0.5205	0.4207	0.4239	0.5133	0.6460	0.4026	0.3981	0.4311	0.6613
97	ECUADOR	0.4668	0.5116	0.4221	0.4326	0.4904	0.6330	0.4850	0.3191	0.5049	0.4776
98	SURINAME	0.4649	0.4681	0.4618	0.2902	0.4203	0.7421	0.3196	0.5051	0.5730	
99	CHINA	0.4647	0.4379	0.4915	0.4863	0.5272	0.2687	0.5913	0.4774	0.6134	0.2402
100	TANZANIA	0.4646	0.4312	0.4981	0.4155	0.3582	0.5406	0.5574	0.4588	0.5633	0.4974
101	KENYA	0.4632	0.5271	0.3993	0.4489	0.5799	0.5559	0.4883	0.3720	0.3810	0.5376

Rank	Countries	Institutionalized Social Technologies (sci)	Index of Institutionalized Social Technologies (sci)			Index of Anti Rent seeking Technologies (Ri)			Index of Risk reducing Technologies (Sii)		
			Anti Rent seeking Technologies (Ri)	Risk reducing Technologies (Sii)	Institutional Rents (Rii)	Policy rents (Ri)	Political Rent (Rpi)	Contract Enforcement and Property Rights (Sici)	Justice System (SiIji)	Law Enforcement (SiLi)	Policy Stability (Sisi)
102	UGANDA	0.4622	0.4927	0.4317	0.4750	0.4833	0.5259	0.4851	0.3866	0.5042	0.4026
103	AZERBAIJAN	0.4561	0.4333	0.4789	0.5038	0.3999	0.3897	0.6176	0.4198	0.7217	0.2489
104	BELARUS	0.4541	0.4168	0.4914	0.4526	0.4404	0.3441	0.5749	0.6403	0.7471	0.1440
105	GUATEMALA	0.4495	0.5226	0.3763	0.4726	0.5217	0.5840	0.4213	0.3960	0.2651	0.6157
106	GABON	0.4471	0.4384	0.4558	0.4757	0.4300	0.4038	0.4309	0.4786	0.6685	0.2325
107	RUSSIA	0.4461	0.4444	0.4479	0.4243	0.3992	0.5247	0.5147	0.3424	0.5748	0.5543
108	PARAGUAY	0.4416	0.4780	0.4053	0.3230	0.5282	0.6027	0.4730	0.3144	0.3625	0.7157
109	NIGER	0.4388	0.3909	0.4867	0.2874	0.3850	0.5231	0.4214	0.3281	0.8290	0.6125
110	VIETNAM	0.4349	0.4077	0.4621	0.4526	0.5921	0.1246	0.5283	0.4026	0.6474	0.2442
111	PAKISTAN	0.4341	0.4663	0.4019	0.4818	0.4547	0.4619	0.4685	0.4376	0.4939	0.2002
112	ETHIOPIA	0.4310	0.4422	0.4197	0.4763	0.4132	0.4372	0.5174	0.2945	0.6319	0.2072
113	BURKINA FASO	0.4309	0.4098	0.4519	0.3407	0.3948	0.5119	0.4316	0.3767	0.6064	0.4578
114	KYRGYZSTAN	0.4214	0.4459	0.3968	0.4770	0.4129	0.4494	0.5680	0.1941	0.5500	0.3055
115	MOZAMBIQUE	0.4199	0.4580	0.3819	0.4470	0.3343	0.6247	0.2941	0.3671	0.4274	0.5523
116	BANGLADESH	0.4187	0.4052	0.4321	0.3355	0.4047	0.4901	0.3431	0.4622	0.5309	0.6056
117	SIERRA LEONE	0.3989	0.4255	0.3722	0.4021	0.3854	0.5036	0.3525	0.2409	0.6000	0.5224
118	NIGERIA	0.3876	0.3974	0.3778	0.3774	0.3672	0.4591	0.4756	0.4148	0.3584	0.5338
119	ALGERIA	0.3845	0.3673	0.4017	0.4563	0.3807	0.2433	0.4630	0.3900	0.5297	0.2431
120	YEMEN	0.3826	0.4007	0.3646	0.3547	0.5294	0.2963	0.5660		0.3895	0.1378
121	VENEZUELA	0.3769	0.4315	0.3223	0.2867	0.3927	0.6545	0.3491	0.2980	0.2779	0.4907
122	SYRIA	0.3767	0.3047	0.4488	0.3622	0.4154	0.0979	0.4488	0.4402	0.6556	0.1563
123	IRAN	0.3754	0.3966	0.3541	0.4731	0.3497	0.3626	0.4433	0.3645	0.2090	0.3574
124	GUINEA	0.3609	0.3392	0.3825	0.2833	0.4019	0.3290	0.4823	0.5288	0.4134	0.2180
125	GUINEA-BISSAU	0.3517	0.3795	0.3238	0.1920	0.4664	0.4978	0.2640	0.1705	0.6072	0.4631

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126	CAMEROON	0.3511	0.3677	0.3344	0.3342	0.4048	0.3622	0.3621	0.2455	0.5432	0.2428
127	TOGO	0.3345	0.3118	0.3571	0.2094	0.3829	0.3473	0.4183	0.3241	0.5100	0.1414
128	LIBERIA	0.3237	0.2880	0.3593	0.2307	0.2070	0.4578	0.3208	0.8095	0.3459	0.2180
129	ZIMBABWE	0.3139	0.2986	0.3291	0.3327	0.2276	0.3456	0.4380	0.3264	0.4087	0.2427
130	LIBYA	0.2963	0.2059	0.3867	0.2950	0.2185	0.0830	0.2436	0.5122	0.7214	0.0000
131	HAITI	0.2952	0.3052	0.2851	0.1881	0.3701	0.3661	0.4073	0.0990	0.4512	0.3525
132	ANGOLA	0.2931	0.2669	0.3193	0.2509	0.2690	0.2838	0.3543	0.3136	0.4984	0.2422
133	COTE D'IVOIRE	0.2906	0.3321	0.2491	0.3503	0.3769	0.2545	0.3727	0.2468	0.2131	0.1183
134	CONGO	0.2717	0.3158	0.2275	0.3238	0.3052	0.3193	0.3197	0.1727	0.2513	0.1156
135	SUDAN	0.2583	0.3268	0.1898	0.3484	0.3383	0.2867	0.4298		0.0272	0.0185
136	Congo, Dem. Rep.	0.2293	0.2133	0.2452	0.1606	0.2019	0.2912	0.1842	0.2696	0.4704	0.2799
137	CUBA	0.2129	0.1895	0.2363	0.3004	0.1660	0.0850	0.0576		0.4806	0.0247
138	IRAQ	0.1511	0.1747	0.1274	0.1715	0.2093	0.1357	0.3600	0.0000	0.0388	0.0288
139	MYANMAR	0.1331	0.0830	0.1832	0.1148	0.0775	0.0515	0.1667	0.2408		0.1170
140	KOREA, NORTH	0.0770	0.0578	0.0962	0.1082	0.0379	0.0216	0.0000		0.0103	0.0000
141	SOMALIA	0.0563	0.0976	0.0150	0.0748	0.0174	0.2247	0.0298		0.0254	0.0000

Note

- ⁽¹⁾ For detail survey of varied meanings of institutions in political science, see Hall and Taylor (1994) or Powell and DiMaggio (1991) for sociological perspective.

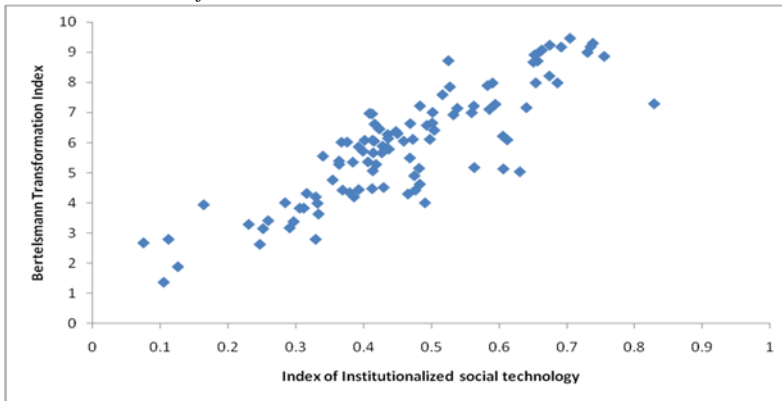
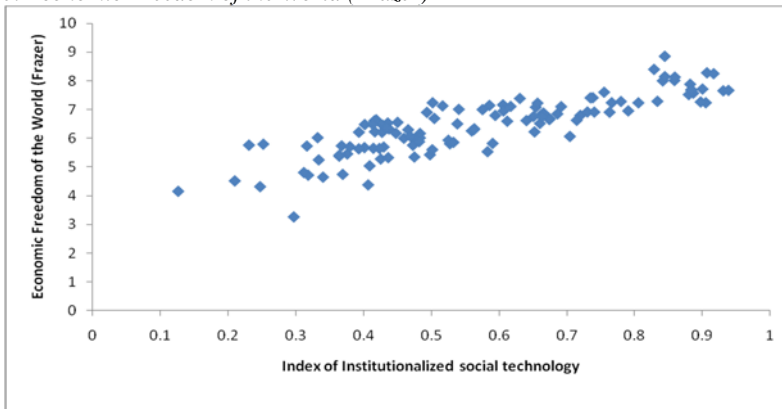
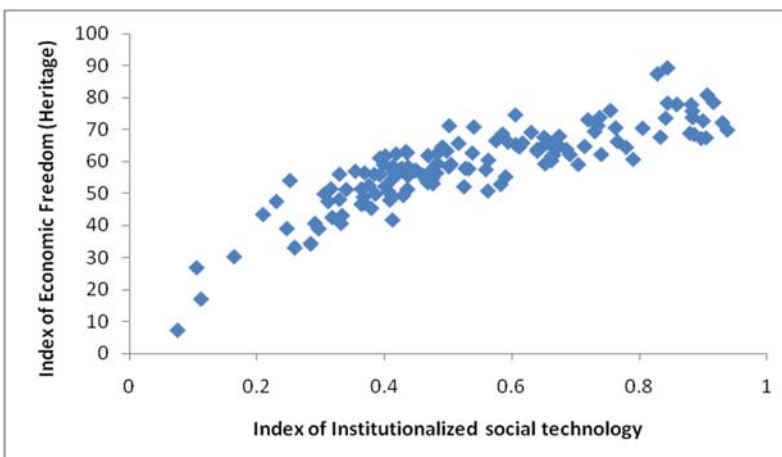
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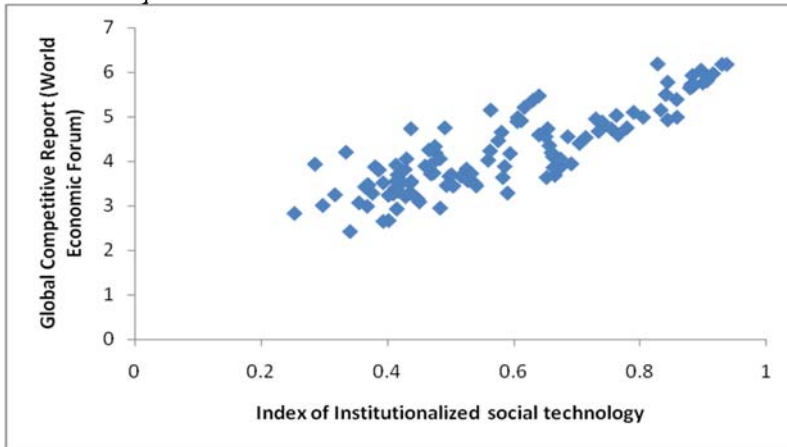
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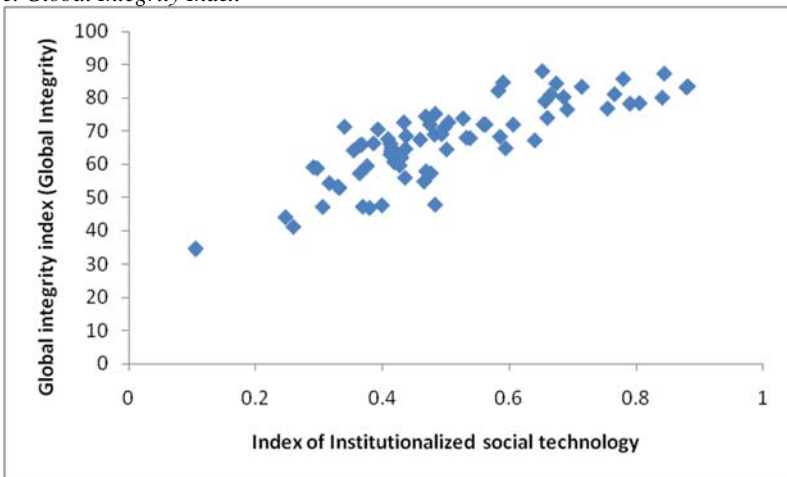
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Figure 2. Comparison with other indices*a. Bertelsmann Transformation Index**b. Economic Freedom of the World (Frazer)**c. Index of Economic Freedom (Heritage)*

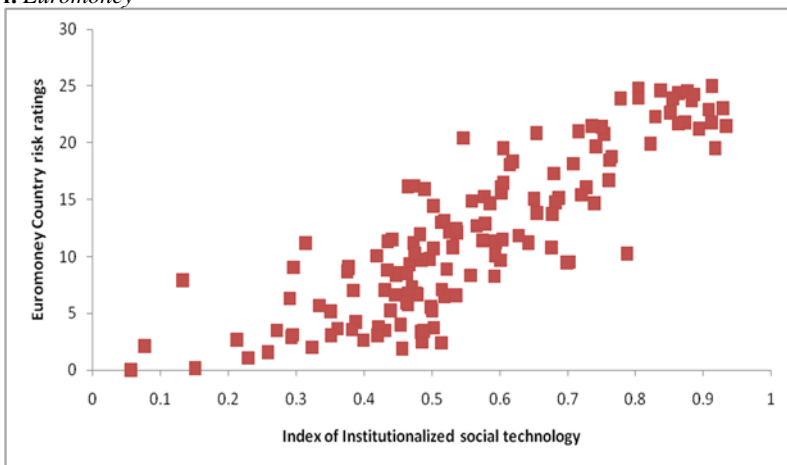
d. Global Competitive Index



e. Global Integrity Index



f. Euromoney



g. *World Audit*