ORIGINAL PAPER

The use (and abuse) of governance indicators in economics: a review

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Abstract   The relatively recent increase in empirical work on the relationship between governance and economic performance has come about largely as a result of the development of a series of indicators that has allowed this relationship to be quantified. For the researcher, it is important to understand the advantages and disadvantages of these indicators, both to ensure the appropriate indicator is chosen, and to be aware of the limitations each entail. To that end, this paper reviews the common indicators used in empirical analysis, as well as some of the other estimation problems that can arise when using these measures.

1 Introduction

The past 20 years has seen a remarkable growth in the empirical literature looking at how governance-related issues influence economic development. Along the way there have been many valuable insights made into this area and, with the literature expanding at an almost exponential rate, doubtless there will be many more to come. Despite this impressive body of work, however, many problems have plagued researchers' work. One of the most important of these issues relates to the data used to quantify governance. The main objective of this paper

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is to review many of these indicators used in the empirical literature, highlighting both their strengths and weaknesses, with the view that future researchers in this area need to explicitly take these issues into account. The paper proceeds as follows. Section 2 will outline some of the common objective datasets used in the literature, while Section 3 examines the common subjectively-determined indicators. Section 4 will examine the methodology used by researchers over the years, with a particular focus on some of the estimation problems that frequently recur in this field. The paper finishes with some brief concluding comments, while the Appendix provides a brief overview of some of the empirical literature in this area.[1]

2 Objective measures of governance

2.1 Measures of political instability and violence

Although researchers in the political science field had been writing about the social and economic effects of instability for a number of years (see, for example, the seminal papers by Huntington 1968; Lipset 1959), the first major empirical work linking the effect of political instability on a nation's economy was from Hibbs (1973). In order to model the political instability in a country, he used data from Banks (1994 and various editions), who had collected an impressive number of statistics on political factors that stretched over a long period of time (some going back to the early nineteenth century). These were objective measures that simply counted the existence of various political occurrences, including the number of coups, demonstrations, riots, political assassinations, strikes and so forth for a particular country in a particular year.[2]

For many years, Banks' data was the only widely available means of statistically investigating institutions. It is no surprise then that the majority of early studies focused on political instability. Hibbs' work was followed by many others, including Venieris and Gupta (1983, 1986), Edwards and Tabellini (1991), Barro (1991), Roubini (1991), and Alesina et al. (1992). Many researchers tended to 'cherry-pick' the individual indicators that were of interest to them, and then develop what was commonly known as a 'Socio-Political Index' from that data. For example, Alesina and Perotti (1993) used the number of assassinations, deaths from mass violence and coups as the basis for their index. Gupta (1990) also constructed his own index, using a slightly wider definition of

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[1] It should be pointed out that, while there are many papers listed in this table, it is by no means an exhaustive list. The proliferation of papers in governance means that it is virtually impossible to account for all such work in a single table. Nevertheless, for the reader new to this field it should provide a good 'jumping off' point.

[2] The variables covered include issues of domestic conflict (such as government purges, riots and assassinations) that are available generally from 1919 for some countries, and political variables (for example, coups, constitutional changes and type of regime) that are available from 1815 for some countries. For a more detailed list of variables covered, see http://www.databanks.sitehosting.net/index.htm.

instability (this included riots, political demonstrations, political strikes, deaths, armed attacks, assassinations, political executions, coups and attempted coups).

The use of these variables in empirical research came about out of necessity and practicality. This was both its benefit and its curse. Many researchers had to use these variables because there was a distinct lack of alternatives for many years. Indeed, some researchers even used these instability variables as proxies for other issues of governance (for example, Barro 1991; Alesina et al. 1992, who used political instability as a proxy for property rights). However, as Knack and Keefer (1995) note, if you use an index of political instability to proxy for property rights, countries that may exhibit extremely low levels of instability may still have despotic and repressive regimes. Conversely, countries who respect the rule of law may exhibit (superficially at least) a relatively high degree of political instability. For example, Gupta (1990) notes the fact that, if the simple objective indicators are taken at face value, the United States was the most politically unstable country in the world during the 1960s and 1970s, because of the number of protest demonstrations held over civil rights and the Vietnam War. Few, however, would say that the US government was in danger of collapsing (or that the US had the worst record on property rights). Although many, like Barro, only used counts of revolutions, coups and political assassinations, others have used a broader definition which includes issues such as protests, demonstrations and strikes. The problem here is that demonstrations and protests, as in the case of the US, may actually be positive events, in the sense that citizens are able to express their opinions and dissatisfactions openly.

This gives rise to another problem when using this political instability data. Researchers, by and large, prefer to use objective data that cannot be influenced by prejudice or favour. In this sense the political instability indices were ideal. Unfortunately, these objective datasets can often be misleading, because they do not address the *quality* of the institutions, nor the breadth of issues that institutions cover (for example, corruption).

2.1.1 Political institutions

Another early area of empirical research centred directly on the *type* of political institutions countries had (rather than their instability as such). By and large, this early work focussed on the relative performance of democracies versus non-democracies. Repeated attempts have been made by researchers over the years to prove a demonstrable link between economic growth and democracy (see Sirowy and Inkeles 1990 for a review of many of these papers). The results, however, have been inconclusive. Huntington and Dominguez (1975), Marsh (1979) and Landau (1986), for example, found 'definitively' that democracy and growth have a negative relationship. Others, such as Adelman and Morris (1967), Weede (1983) and Sloan and Tedin (1987) purported to show that the relationship is a positive one. Finally, some studies, such as Feierabend and Feierabend (1972), Dick (1974) and Marsh (1988) hypothesise that there is no relationship at all.

Among the problems researchers have encountered is with the identification of regime type. Most studies used ordinal measures, in the simplest case giving a value of one if it were a democracy and zero if authoritarian (for example, Landau 1986). Others tried to show a range of regime types, varying in the degree of authoritarianism and democracy. The majority of these, however, were by their nature highly subjective and based on the researchers' own impressions of the type of regime for each country (see for example, Dick 1974; Sloan and Tedin 1987). Given these weak results, some researchers have argued that perhaps these papers were looking at the wrong thing. If authoritarian and democratic regimes could be both 'good' and 'bad', then the explanation for growth may lie outside of these narrow definitions. The first attempt to go beyond this democracy/non-democracy dichotomy was Gurr's POLITY database.

2.1.2 Polity database

Initially constructed by Gurr (1974), this database has been continually updated and expanded, and now has information on political structures dating back to 1800 for some countries. It contains coded annual information on regime and authority characteristics for all independent states (with a population greater than 500,000) that cover not only democracy or authoritarian indices, but also issues such as executive constraints, the openness to political participation of 'non-elites', and political competition. This database has been used extensively over the years by both political scientists and economists (for example, see Glaeser et al. 2004; Acemoglu et al. 2003).

2.1.3 Database of political institutions

Compiled by Beck et al. (2001), this database consists of 113 variables for 177 countries between 1975 and 1995 (this has subsequently been expanded past 1995). Although it is by design a disaggregated database (researchers, for example, are encouraged to put together their own indices that are relevant to their particular study), one of the major variables that has commonly been used by others in the literature is that measuring executive constraints, or 'checks and balances', which is an index composed of several of these disaggregated variables (for example, see Keefer and Stasavage 2003; Keefer 1999). Although the POLITY database also has a measure of constraints, this definition of executive constraints is subjectively-based, while the constraints index by Beck et al. is a composite based on objective political data. The rationale behind this checks and balances indicator is that the more checks and balances that exist, the more constrained a government is, and so the less likely they will be able to impose 'bad' policies on society.[3] This indicator essentially counts the number of veto players in a political system and adjusts the score to reflect the

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[3] In addition to this, there were also variables that looked more specifically at political instability, the type of political system, the role of the military and electoral rules. For more information on the full range of variables, the dataset is available at http://econ.worldbank.org/resource.php?type=18.

degree of independence these veto players have (based on their respective party affiliations, the current electoral rules, and the level of electoral competitiveness in a system).

2.1.4 Political constraint index

A similar database has also been developed by Henisz (2000), known as the political constraint index. Although it is similar in intent to the checks and balances indicator developed by Beck et al. (2001) it covers a much longer time frame (for some countries the database goes back to 1800), and is simpler in its construction. As Beck et al. (2001) note:

> *'His series addresses some key issues, such as the number of chambers in a legislature, the degree of federalism, Supreme Court turnover, factionalisation of the legislature, and the relative influence of different parties among the executive, legislature and judicial branches…the Henisz data has a longer time-series, but substantially fewer variables (e.g. with regard to government or opposition parties, party orientation, electoral rules, the different federalism indicators etc)' [p. 36]*

Henisz employs a spatial model to determine the political constraints imposed upon policy makers. The first step is to count the number of branches of government that have (potentially) veto power over policies (for example, the executive, lower and upper legislative chambers, judiciary and sub-federal institutions). It then adjusts for the degree to which these branches are aligned with the executive. For example, if the current government has an absolute majority in all houses of parliament, as well as appointing Supreme Court judges, then there are few constraints on the actions of the executive, and so a low score is registered. This score increases (that is, the constraints get larger) as the branches of government become less aligned with the executive.[4] Papers to have used this version of constraints include Aghion and Alesina (2004), Mobarak (2005), and Plumper and Martin (2003), among others.

These political databases, while having much to recommend them, are not the most commonly-used governance variables in the economics literature. One of the reasons for this is that many consider them to only be accounting for the 'top tier' of institutions (the executive and legislative branches). They are not particularly well suited, however, for gleaning information about other institutional bodies, such as the bureaucracy or the judicial branches of government.[5] As such, the majority of researchers over the past few years have preferred to use subjectively-based measures of governance compiled by private organisations (whether they be for-profit organisations, or NGOs).

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[4] For the specific methodology, see Henisz (2000).

[5] Although the political constraint index has the capacity to include the judiciary, the author cautions that these are not particularly reliable.

3 Subjective measures of governance

3.1 Freedom house index of civil and political liberties

Published annually since 1973, these two indices have been developed to measure the degree of civil and political liberties in a country.[6] Each index gives an overall score of 1–7, with higher scores reflecting poorer liberties, and are compiled by analysts from sources such as news reports, NGO publications, think tanks and individual professional contacts.

The use of the Freedom House indices reflected the move away from objective measures of political institutions in an attempt to go 'behind the scenes' of a country and examine the freedom of its citizens. These indices have been used extensively over the years by researchers, including Scully (1988), Levine and Renelt (1992), Sachs and Warner (1995a) and Isham et al. (1997).

The main benefits of the Freedom House indices are its country coverage (around 192 countries by 2003), and its relatively long time series data (from 1973). This allows the researcher to develop a reasonably large sample size, and to view the effects of liberties on economic variables over a number of years. One problem with these indices, however, is that the researcher needs to be careful about what exactly they are trying to capture. Although both civil and political liberties are undoubtedly important facets of any society, they are less suited to examining other governance-related issues. As Knack and Keefer (1995) note:

'Although they (the Freedom House indices) *embody some consideration of the security of private property, they contain multiple and diverse other dimensions, including freedom of religion and rights of worker association. For many purposes these variables are of great importance. However, many of the dimensions are not closely related to property rights.' [p. 210]*

Although they were talking more specifically about property rights issues, this applies equally to other governance factors, such as corruption, or bureaucratic quality.

Another issue relates to the fact that both indices are compiled by country experts, and as such the scores are subjectively determined (see, for example, Minier 1998). Furthermore, they have also been criticised on the grounds that they measure outcomes, rather than governance (Durham 1999).

3.2 International country risk guide (ICRG)

This is perhaps the most widely-used institutional measure today. The political risk rating that is used has data dating back to 1984, and coverage of

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[6] The civil liberties index includes issues such as: citizens' freedom from censorship, freedom of assembly, freedom of religion and freedom of political association. The political liberties index covers the electoral process, the functioning of government and the degree of political pluralism and participation. For more information, see Freedom House (http://www.freedomhouse.org/index.htm).

140 countries (Political Risk Services 2003). Table 1 outlines the main sub-components of this index. Scores are again derived by 'country experts', meaning that it is subjective by its nature. Over the years, researchers have either taken the whole of the index or, more commonly, have taken out the components that best suit their area of study. This includes the first widely-cited paper to use the ICRG data (Knack and Keefer 1995). In this paper, they took the following components of the overall political risk rating to develop their measure of 'institutional quality'. These were:

(a) The rule of law;
(b) Corruption in government;
(c) The quality of the bureaucracy;
(d) Risk of expropriation of assets by government;
(e) Repudiation of contracts by government.[7]

Since this paper, numerous researchers have either taken Knack and Keefer's definition (such as Hall and Jones 1999; Rodrik 1997; Sala-i-Martin 1997 and others), or have used individual components of this index, such as Rodriguez and Rodrik (1999), who used the Bureaucratic Quality measure, Sachs and Warner (1995b), who used the Rule of Law measure, Wei (2000a), who used the corruption index, and Acemoglu et al. (2001), who used 'Risk of Expropriation'.

Although this is an extremely common measure, it is not without its problems. One issue relates to the fact that it is compiled by country experts, and is aimed at international investors, rather than domestic agents. In this sense, it may give a slightly distorted view of governance within a country if the problems faced by domestic firms are not the same types of problems encountered by foreign investors. For example, included in the political risk rating is a country's investment profile, which looks at the attitude and policies of a government towards inward investment (not necessarily investment overall). Furthermore, although ICRG have an extremely wide coverage of countries, it is not necessarily the case that each country is given equal resources to compile them. Because this index is aimed at international investors, it stands to reason that resources be concentrated in those countries that these investors would be interested in. Although this obviously includes the rich OECD countries, this is also true for large developing countries as well (Russia, China, Indonesia, India and Brazil for example). However, when these scores are used for wide cross-country studies, it may mean that the results for smaller countries are more prone to measurement error (Torrez 2002).

Glaeser et al. (2004) also criticise the ICRG database based on some of the anomalies they find in the scores given for some countries. Of the three institutional-type indicators they look at (the other two being the KKZ Indicators discussed below, and the POLITY data discussed in the previous section), "... *this one is the most problematic*" [p. 276]. Whilst their criticism was aimed largely at the 'Risk of Expropriation' measure, this criticism could extend to

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[7] These last two measures are sub-components of the investment profile category.

Table 1 ICRG political risk rating (0–100)

Government stability (12 points)
  A measure of the government's ability to stay in office and carry out its declared program(s), depending upon such factors as the type of governance, cohesion of the government and governing parties, approach of an election, and command of the legislature.

Socio-economic conditions (12 points)
  An estimate of the general public's satisfaction or dissatisfaction with the government's economic policies, covering a broad spectrum of factors ranging from infant mortality and medical provision to housing and interest rates. Different weights are applied in different societies, depending upon the relative political impact.

Investment profile (12 points)
  A measure of the government's attitude toward inward investment as determined by four components: the risk to operations, taxation, repatriation, and labour costs.

Internal conflict (12 points)
  A measure of political violence and its actual or potential impact on governance, taking into consideration such factors as whether threats exist, whether they have political objectives, the size and strength of support, and the geographic nature of the conflict.

External conflict (12 points)
  A measure of the risk to the incumbent government and to inward investment, ranging from trade restrictions and embargoes through geopolitical disputes, armed threats, border incursions, foreign-supported insurgency and full-scale warfare.

Corruption (6 points)
  A measure of corruption within the political system that is a threat to foreign investment by distorting the economic and financial environment, reducing the efficiency of government and business by enabling people to assume positions of power through patronage rather than ability, and introducing inherent instability into the political process.

Military in politics (6 points)
  A measure of the military's involvement in politics. Since the military is not elected, involvement, even at a peripheral level, diminishes democratic accountability. Military involvement might stem from an external or internal threat, be symptomatic of underlying difficulties, or be a full-scale military takeover. Over the long term, a system of military government will almost certainly diminish effective governmental functioning, become corrupt, and create an uneasy environment for foreign businesses.

Religion tensions (6 points)
  A measure of religious tensions arising from the domination of society and/or governance by a single religious group – or a desire to dominate – in a way that replaces civil law by religious law, excludes other religions from the political/social processes, suppresses religious freedom or expressions of religious identity. The risks involved range from inexperienced people imposing inappropriate policies to civil dissent or civil war.

Law and order (6 points)
  Two measures comprising one risk component. Each sub-component equals half of the total. The "law" sub-component assesses the strength and impartiality of the legal system, and the "order" sub-component assesses popular observance of the law.

Ethnic tensions (6 points)
  A measure of the degree of tension attributable to racial, national, or language divisions. Lower ratings (higher risk) are given to countries where tensions are high because opposing groups are intolerant and unwilling to compromise

Democratic accountability (6 points)
  A measure of, not just whether there are free and fair elections, but how responsive government is to its people. The less responsive it is, the more likely it will fall.
  Even democratically elected governments can delude themselves into thinking they know what is best for the people, regardless of clear indications to the contrary from the people.

Bureaucratic quality (4 points)
  Institutional strength and quality of the bureaucracy is a shock absorber that tends to minimize revisions of policy when governments change. In low-risk countries, the bureaucracy is somewhat autonomous from political pressure.

other categories as well. For example, in December 2000, Ireland received a score of 2 (out of 6) for corruption, which was the same score given in that period to countries such as Angola, Azerbaijan, North Korea, Cameroon and Haiti.[8] One of the problems with this corruption measure from ICRG lies in its derivation. The editor of ICRG, Thomas Sealy notes that the derivation of the ICRG corruption measure is based on:

> '... *how long a government has been in power continuously. In the case of a one-party state or non-elected government, corruption, in the form of patronage and nepotism, is an essential prerequisite and it is therefore corrupt, to a greater or lesser degree, from its inception. In the case of democratic government, it has been our experience, almost without exception, that things begin to go wrong after an elected government has been in office for more than two consecutive terms, that is, eight to ten years. ... The lowest ratings are usually given to one-party states and autarchies.*'[9]

Basing the corruption index on the length of time in office and how the government came to power would appear to be a fairly indirect and, in our view, imprecise methodology to use for corruption. ICRG maintain that this measure of corruption is actually designed as an indication of the *political risk* associated with corruption, rather than corruption per se (Galtung 2005), a point which is often missed by researchers who prefer to use this index as a direct measure of the incidence of corruption. Whether one takes this corruption measure in its intended, narrower, form, or takes it using the more conventional definition of corruption, the fact of the matter is that this index has been used extensively in the literature over the years, and researchers who prefer this index need to be aware of what it is they are using.

Another worrying criticism, particularly given its use by international investors, is the fact that the rating scores can sometimes lag the major events they are purporting to measure. For example, Linder and Santiso (2002), who investigated the predictive powers of the ICRG's economic, financial and political risk ratings in Brazil, Argentina and Peru in the late 1990s, suggested that although the economic and financial ratings performed reasonably well:

> '*A closer look at ... the political risk rating, which typically is based on survey data and individuals' perceptions, is particularly vulnerable to misinterpretation, as it appears to have reacted to actual events rather than predicted them. This finding thus leads us to question whether the political risk indicator of the ICRG model behaves more as a lagging indicator rather than a leading indicator of crises.*' [p. 14]

In cross-sectional analyses where long-run averages are taken this probably does not matter too much, as they are at least picking up these political factors at some point. It does, however, matter if one wants to see whether institutional 'shocks' predate an economic crisis.

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[8] Other countries, such as Sierra Leone and Côte d'Ivoire, actually had a *higher* score than Ireland.

[9] As quoted in Galtung (2005).

These criticism surrounding the generation of indicators based on subjective opinions also relate to some of the other commonly-used indicators in the literature, such as those compiled by Business International (BI) and Business Environment Risk Intelligence (BERI 2003).

3.3 Other political risk ratings

3.3.1 Business Environment Risk Intelligence

The BERI index of political risk dates back to 1972,[10] which certainly gives it a better coverage over time compared to the ICRG index, however, it covers a much smaller range of countries. The historical ratings have data on 53 countries, 26 of which are OECD countries. As a result, the majority of papers have tended to use another measure of governance (such as the ICRG index) as the primary source, and then used the BERI index to test the robustness of their results. This was the approach taken by Knack and Keefer (1995), Svensson (1998) and others.

The major areas covered by their political risk index include the following categories:

Internal causes of risk

- Fractionalisation of political spectrum and the power of these factions;
- Fractionalisation by language, ethnic and/or religious groups;
- Restrictive measures required to retain power;
- Mentality, including xenophobia, nationalism, corruption, nepotism and so on;
- Social conditions, including population density and wealth distribution;
- Organisation and strength of forces for a radical government.

External causes of political risk

- Dependence on and/or importance to a major hostile power;
- Negative influences of regional political forces.

Symptoms of political risk

- Societal conflict involving demonstrations, strikes and street violence;
- Instability as perceived by non-constitutional changes, assassinations and guerrilla wars.

Each of the ten components of political risk are given a score of 0–7 (a rating of seven indicates no problems; a score of zero indicates prohibitive problems). As a further measure, the country expert can allocate a further 30 points based on the eight causes of risk if they believe certain issues are particularly important. As a result, the maximum (best) score a country can get is 100.

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[10] However, data available to purchase from their website only dates back to 1980.

3.3.2 Business International (BI)

This group has now been incorporated into the Economist Intelligence Unit (EIU 2004), however, initially this index contained 57 countries (with data from 1971–1979), rising to 68 countries (1980–1983). Since 1984, country coverage through the EIU has expanded significantly, to include around 100 countries. The issues covered by the original BI index include the following:[11]

- Corruption index;
- Bureaucratic efficiency (efficiency of judicial system, absence of red tape and absence of corruption);
- Political stability (institutional and social change, opposition takeover, stability of labour, relationship with neighbouring countries and terrorism).

The expanded EIU index includes:

- Political stability (war, social unrest, orderly transfers of government, politically motivated violence and international disputes);
- Political effectiveness (pro-business orientation, institutional effectiveness, bureaucracy, transparency of legal system, corruption and crime).

As with the BERI data, the BI indicators were often used to reinforce the results from other datasets such as ICRG (for example, Gupta et al. 1998), however, they were also used in their own right as the 'primary' governance indicator (with support from other sources). Examples of papers that used the BI indicators as the primary variable include Mauro (1995), Tanzi and Davoodi (1997), Hines (1995) and Wei (1997, 2000b).

Aside from the measures listed above, there are a number of other private firms that produce risk ratings, such as Standard and Poor, Moody and Euromoney. Their focus, however, is more on the risk to international financial investors, and so any governance-related indicators tend to revolve around the rule of law, and the dangers of governments expropriating assets or profits.[12] As such, they are more credit ratings than broad measures of governance. Moreover, they are rarely used in the empirical literature, and so further information on these ratings will be left to the interested reader.[13]

Overall, these subjective risk ratings have proven to be extremely popular in the empirical literature. They are not, however, free from criticism. Attempts to use these indicators for time series analysis, for example, are likely to prove problematic if used to establish a causal relationship. These country experts may only downgrade their scores *after* a crisis or shock emerges in a country (that is, when it becomes common knowledge). The institutional foundations of

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[11] Further details can be obtained from the EIU (www.eiu.com).

[12] For example, Euromoney include a measure of 'the risk of non-payment or non-servicing of payment of goods, services, loans, trade-related finance and dividends and non-repatriation of capital.' For more information, see http://www.euromoney.com/default.asp.

[13] Standard and Poor's political risk rating has, however, been used by Alesina and Weder (1999), and indicators from an offshoot company of Standard and Poor's (DRI) are used in the composite governance indicator by Kaufmann et al. (1999b), which is discussed below.

that shock, however, would most likely have been accumulating in the months and years prior to the shock. This is not the country experts' fault as such, but it does make causal inference difficult in these circumstances. There is also the important issue of seemingly anomalous scores for certain countries. Another common problem with these measures is either that they lack adequate coverage across countries (for example, the BI and BERI indices), or across time (for example, the ICRG database only goes back to 1984).

3.3.3 Country policy and institutional assessment (World Bank)

The World Bank has been internally rating countries on their policy and institutional performance since the late 1970s, however, these have until recently been kept 'in-house'. In 1998 the criteria was expanded to include not just policy-related issues, but institutional issues as well. Today, scores are determined based on twenty criteria grouped into four broad categories:

- Economic management;
- Structural policies;
- Policies for social inclusion/equity;
- Public sector management and institutions.

In 2005 it was decided to release this information publicly, however, it is not clear at this stage precisely what benefits may arise from these indices, at least in terms of empirical analysis. The first issue is that the disclosure of this information relates only to International Development Association (IDA) countries, not all members of the World Bank, and so information exists for only 76 countries.[14] Secondly, only data from 2005 onwards is to be released and so there is no possibility (at this stage) to take advantage of the temporal component, which would probably have been its most compelling feature for empirical researchers. Moreover, the extensive methodological changes in 1998 to incorporate institutional factors would in any event render this time series information somewhat dubious. Nevertheless, the CPIA may ultimately provide another avenue through which researchers may be able to test the robustness of their results.

3.4 Survey based data

The move from the narrow definitions of the objective political instability indicators towards the subjective 'country expert' ratings from ICRG, BERI and others provided some valuable insights into the role that governance plays in an economy. The fact that these were often aimed at international agents, however, has led to an increase in survey-based data, with the theory being that responses from citizens directly involved in the institutions of a country are far better placed to give an indication of the institutional environment as it

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[14] Countries eligible for IDA assistance must have a per capita level of GDP below US$1,025 (in 2006), and have poor creditworthiness to borrow at existing market terms. This applies to 81 countries, five of which did not have data collected for the CPIA.

relates to domestic agents. Although still perception-based, in that the questions within the survey often required subjective answers from the participants, most of these surveys had the benefit that they were based on information coming directly from people or organisations within the country itself, and were not reliant on these country experts. Moreover, the questions were generally framed to cover the domestic situation, and were not designed specifically for the potential overseas investor.

The main problem with these survey-based indicators is that they are a relatively recent phenomenon and, due to the complexities involved with carrying them out, have often been 'one-offs'. Even if they are designed to be repeated in the future, the fact that the first surveys were only carried out in the latter half of the 1990s makes it difficult to say anything meaningful about governance before this period.[15] It is therefore impossible to get any sense of the importance that changes in governance may have on a country over a relatively long period of time. Although these surveys help enormously in the sense that more information is always preferred to less, the proliferation of these surveys means there exists no 'definitive' governance measure. For example, many of these surveys cover a specific region or group of countries, and are therefore not applicable to wide cross-country investigation. There is also the problem that none of these surveys are identical in either their scope or their intention, and so it makes comparisons between them difficult.[16]

Partly in response to this enormous increase in institutional information coming from all of these sources, there has been a move to aggregate many of these different datasets into composite ratings.

3.5 Composite ratings

In essence, these are 'super indexes', that combine various datasets into the one overall index. Given the degree of potential measurement error in one particular survey or index, the use of multiple sources for each country should in theory be more accurate (although the authors of these indicators are quick to stress that this does not make them completely error free). The two most commonly used datasets that are derived in this fashion are from Transparency International (TI), and the World Bank's Governance Indicators produced by Kaufmann et al. (1999b).

3.5.1 Transparency International

TI have produced a 'corruption perceptions index' with relatively wide country coverage since 1995. The original number of countries covered was only 41,

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[15] The survey conducted for the World Development Report in 1997 (World Bank 1997) is a possible exception to this, as it did ask respondents what the situation was like in their country 10 years prior to the survey, however, there are almost certainly perception biases here that reduce the power of these results.

[16] Although space precludes a detailed listing of these surveys, the interested reader should refer to http://www.worldbank.org/wbi/governance/govdatasets/index.html, for more information.

however, that has now been expanded to 133 countries. The sources used to construct this index include:[17]

- Global Competitiveness Report
- World Competitiveness Yearbook;
- Information International (survey of businesspeople from 31 Middle East countries)
- World Business Environment Survey;
- Economist Intelligence Unit;
- Freedom House (Nations in transit);
- World Markets Research Centre Risk Ratings (red tape and corruption, covering 186 countries);
- Columbia University State Capacity Survey (224 US-resident country experts on corruption in 95 countries);
- Political Economic Risk Consultancy (PERC);
- PriceWaterhouseCoopers Opacity Index (survey on corruption, covering 34 countries);
- Gallup International (survey of senior businesspeople across 21 emerging economies);
- Business Environment and Enterprise Performance Survey (BEEP) (survey of 6,500 people in 25 transition countries on corruption).

Although not all countries were covered by each of the measures, the index was constructed by giving a weighting to each of these. TI is also careful to include the number of sources for each country, with the theory being the more sources available, the more reliable the overall score.[18] TI also produce a Bribe Payers Index (BPI), which looks at the propensity of agents from developed countries to pay bribes in foreign countries. To date, this index has been constructed for 1999 and 2003.

Given its aggregative nature, the TI corruption index is now a relatively common institutional measure in the literature (for example, see Wei 2000b; Gyimah-Brembong 2002; Ng and Yeats 1999; Torrez 2002, among others). This index, however, is also not without its weaknesses. A minor concern is that expansive country coverage did not begin until 1998, and so papers that use this index before this period may suffer from sample selection issues.[19] Another criticism is that, at the same time the country coverage has increased, so too have

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[17] Further information can be obtained from Transparency International (http://www.transparency.org).

[18] The actual mean score for each country is constructed using a percentile-matching technique, and then a beta-transformation is imposed to increase the standard deviation among countries. Finally, TI provides a high-low score range, which is the 90% confidence interval (5% above, and 5% below).

[19] For example, Treisman (2000), looking at the relationship between corruption and trade, found that corruption was a significant factor when using the TI index for 1996 and 1997, but not for 1998. Knack and Azfar (2003) note that this is likely to be because the 1998 index included a much broader range of countries, which then casts doubt on his results, given that a larger sample size is generally preferred to a smaller, less representative sample.

the number of data sources they use. This makes it less useful for comparisons over time, such as that attempted by Gyimah-Brembong (2002).

3.5.2 Governance indicators ('KKZ indicators')

These governance indicators were developed by Kaufmann, Kraay and Zoido-Lobatón in 1999, with the first year of data being 1996–1997, and have subsequently been updated every second year. They have taken a similar approach to the TI corruption perceptions index, however, they have attempted to cover a broad range of governance indicators, not just corruption. These indicators are divided into six categories:

- Voice and accountability;
- Political instability and violence;
- Government effectiveness;
- Regulatory burden;
- Rule of law;
- Graft (corruption).

From this data, they have taken those aspects relevant for their indicators, and then divided them up into 'representative' and 'non-representative' sources (representative sources essentially have a broader coverage of countries).[20] Although the interested reader should refer to the relevant papers for more details (Kaufmann et al. 1999a,b), each indicator is designed using an unobserved components model. As a result, they obtain an overall point estimate score for a country, as well as 90% confidence intervals. In other words, they acknowledge that while inferences about governance can be made between countries at the top and bottom of the scale (because the confidence intervals do not overlap), researchers need to be careful about making inferences on countries that have similar point estimates.[21]

Given that these indicators cover a broader definition of institutions and governance than the TI index, they have become widespread in the literature in a very short space of time. The benefit here is that, like the ICRG indices, researchers can pick and choose either an individual category, such as the rule of law, or combine them into a more general 'institutional' variable. For example, Dollar and Kraay (2003) and Rodrik et al. (2004) use the rule of law index, while Easterly and Levine (2003) use all six categories combined into one.

Moreover, irrespective of whether the KKZ indicators are more 'accurate' than others, these indices have become important because they are now influencing specific policy decisions by governments, particularly with respect to aid donations. For example, the US government's Millennium Challenge Account

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[20] Some of the sources they have gathered their data from include the BERI, ICRG, EIU and Freedom House indices, as well as data from DRI (Standard and Poor), Gallup International, the Global Competitiveness Survey, Wall Street Journal, Political Economic Risk Consultancy and the World Competitiveness Yearbook.

[21] As a general rule of thumb, the more data sources used in an estimate, the narrower the upper and lower bound of the confidence interval will be.

aid program requires that recipient countries score above the median of a group of 70 potentially-eligible countries on the Graft (Corruption) index (Kaufmann et al. 2005).

Despite its increasing use and influence, there are two potential problems with these KKZ indicators. The first is a common one, in that it is a relatively recent construct, and so is unsuitable at the moment for time series analysis. The second is a criticism that can also be levelled at the TI composite index, in that the individual datasets used to create the composite may be unduly influenced by some of the other individual datasets. For example, 'country experts' used to determine an institutional score for a country in one index may already know the scores for that country from, say, the ICRG index, and so the ultimate score they give may be in part a reflection of the scores that others have given. Although 'more information is preferred to less', if they are all copying and reacting to each others' work then the potential measurement error here could be extremely large.[22]

3.5.3 Economic freedom index (EFI)

Another composite measure used is the Fraser Institute's Economic Freedom Indices developed by Gwartney et al. (1996). These are increasingly common indices to use, because they have a time series component (data goes back in 5-year intervals to 1970), and so causal inferences can potentially be made (see, for example, Dawson 2003; Farr et al. 1998).[23]

The EFI combines a number of categories purporting to measure different aspects of this economic freedom, including:

1. Size of government;
2. Structure of the economy and use of markets;
3. Monetary policy and price stability;
4. Freedom to use alternative currencies;
5. Legal structure and property rights;
6. Freedom to trade with foreigners, and
7. Freedom of exchange in capital and financial markets.

One of the problems with this index, however, is that the index combines governance measures (such as legal structure and property rights) with variables that could be labelled as 'outcomes', or policies resulting from the quality of the institutions, such as monetary policy and price stability, and freedom to use alternative currencies. This does not necessarily make it a poor indicator of 'economic freedom' but it does make it a relatively poor indicator of governance. This is particularly relevant if one wants to use additional variables in

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[22] Our thanks to an anonymous referee for pointing this issue out.

[23] However, the sample of countries dating back to the 1970s is relatively small. For example, there are only 54 countries available if one wants to go back to 1970. Vega-Gordillo and Alvarez-Arce (2003), for example, run a causality analysis on only 48 countries, 20 of whom are high-income OECD countries.

the analysis, such as trade, because trade-related freedoms are included within the index.

More importantly, however, the main governance-related component within the index (Legal Structure and Security of Property Rights) is put together in part from various Global Competitiveness Reports, and therefore actual data is only available from 1995 onwards. They then extrapolate backwards using the other measures of Economic Freedom to derive scores for this component back to 1970. This technique, however, is fraught with problems, and researchers should be very careful in using this specific measure of property rights, because this essentially assumes that property rights in the past moved in unison with these other measures of Economic Freedom, without any evidence that this is likely to have occurred.[24]

3.6 'Second generation' indicators

These so-called 'second generation' governance indicators (their term, not ours) have arisen out of work conducted by the World Bank, in conjunction with the Development Assistance Committee (DAC) of the OECD, and the UK government's Department for International Development. The overall goal for these indicators is that they can be used by governments around the world to formally evaluate their progress in several key areas of governance. Knack et al. (2003) identified the following criteria that these indicators have to meet:

1. They can be generated through a transparent process, and the sources of data are politically acceptable to governments;
2. They should be available across many countries and over time;
3. They should be of high quality and accuracy;
4. They should be relatively specific in what they are trying to measure.

Although very much still a work in progress, they have been able to identify a number of performance indicators that they believe meet (at least some of) the above criteria:

- Budgetary volatility (118)
- Revenue source volatility (118);[25]
- Contract intensive money (CIM) (152);
- Number of independent business start-up procedures (85);
- Number of independent legal actions to evict tenants (105);
- Number of independent legal actions to collect overdue debt (106);

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[24] This is in addition to the problems relating to the ICRG data that have already been discussed, which they also use.

[25] The Budgetary and Revenue volatility measures are designed to capture the unpredictability of government policy decisions. The Budgetary volatility indicator is derived by using the 14 expenditure and revenue classifications used by the International Monetary Fund in their Government Financial Statistics database, and calculating the median of the year-to-year changes in each of these classifications over the previous 4 years (the Revenue volatility measure uses only the revenue classifications).

- Waiting time for a telephone line (169);
- Policy unpredictability (66);
- Predictable judiciary (67);
- Crime and theft as obstacles to conducting business (22);
- Enforcement of property rights (67);
- Respect for government employees (57);
- Public perceptions of corruption in the public service (57);
- Per cent of population fearful of crime (60);
- Per cent of population expressing confidence in the state's ability to protect them from crime (60);
- Quality of service delivered (67);
- Frequency of power outages (67).

For example, the CIM indicator developed by Clague et al. (1996, 1999) is designed to measure property rights. Their argument followed the Williamson (1995) hypothesis that the existence of long-term contracts was a sign of a developed economy, as it showed confidence in dealing with other parties. If this trust existed, then investment would be higher. They argued that if this were true, then this would be reflected in a high proportion of the money supply being held in financial institutions (indicating long term, high value transactions were taking place). The greater the proportion of money held in currency, the less faith people had in making these transactions. Furthermore, they felt that during times of instability, more people would hold their wealth in currency due to the uncertainty over economic conditions.

CIM is calculated as

$$\text{CIM} = \frac{(M2 - C)}{M2}$$

where
$M2$ = a broad definition of the money supply[26]
C = currency held outside the banking system.

The benefit of using CIM as a proxy for contract rights is that the data is available for many countries over a long period of time (from 1948 in some cases). Higher values of CIM indicate a greater reliance on or preference for long-term contracts.

There are, however, a couple of potential problems with using this indicator. For example, CIM may only be reflecting the level of financial sector development. Although many have found this to be an important factor in economic development (King and Levine 1993; Levine 1998, among others), it does not necessarily say anything about property rights.[27] It is also a very broad measure,

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[26] Specifically, $M2$ was defined as the sum of currency outside banks, demand deposits, time deposits, and time and savings deposits.

[27] However, to test this, Clague et al. ran a factor analysis of the variables they use for property rights (including ICRG and others), and the variables used by King and Levine for financial

in that it is unclear which institutions may be driving the results (for example, the judiciary, the bureaucracy or the executive branches of government). Finally, it also relies heavily on the accuracy of the data used. If the accuracy of the data is questionable, then the resultant CIM scores will also be dubious.[28]

This highlights a problem with many of these 'second generation' indicators, in that few of these, if any, satisfy each of the four criteria they are technically supposed to meet. For example, while the CIM indicator covers over 150 countries across 40 years, it lacks specificity. That is, while it may meet criteria (1), (2) and perhaps (3) from above, it does not meet (4). Some of the others, however, lack adequate coverage across countries (such as the 'crime and theft as obstacles to conducting business' measure), or across time (such as the 'number of independent business start-up procedures'). Indeed, one of the major problems here is that the measures that have adequate temporal coverage are also the ones that lack specificity, while the ones that are the most specific are the ones that lack adequate time series. This, trade-off, unfortunately, is a problem unlikely to be rectified. Because the investigation of governance-related issues is a fairly recent phenomenon, no one ever collected specific data across a broad range of countries before the 1980s. Hence researchers are forced to be a bit 'creative' and use inferred indicators such as CIM, even though the data used to create it was originally intended for other purposes. If one is prepared to accept the loss of specificity in order to get *some* idea on the causal influence of institutions over a longer time frame, then the use of these types of indicators may yield useful insights. It would be extremely important, however, for the researcher to explicitly discuss the limitations of this approach.

4 Methodological issues in governance research

Although the issue of finding an appropriate measure of governance for empirical analysis is a crucial one, it is not the only potential problem researchers' face. Governance research is also hampered to some extent by estimation issues. In large part, this revolves around the endogeneity of governance variables with respect to the causal inferences on the links between governance and economic development.

By and large, the majority of empirical governance papers use some form of cross-sectional investigation. There are several practical reasons for using cross-sectional analysis in this area. The first reason is simplicity, in that the author does not have to take into account some of the more common problems that occur in time series analysis, such as serial correlation. Using cross-sectional

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development (*M*2/GDP, and others), and found that they both loaded on different factors. They also added in King and Levine's variables into their regression analysis, and found that there was little impact on CIM as an explanatory variable. They were therefore confident that the two indicators were capturing different things.

[28] While the data is taken from the IMF's *International Financial Statistics* database, the primary source of the data is from each individual country's statistical bureau, or central bank, and so measurement error may be particularly acute here.

analysis, it is also possible to say, for example, that 'countries with lower levels of governance are associated with lower levels of economic growth'. What cross-sectional analysis cannot convincingly establish is that 'a deterioration in governance is associated with a deterioration in output'. That is, it is not very useful for looking at *changes* in governance variables over time. One of the potential ways to account for this in cross-sectional analysis is to take the difference in the variable between the first and last periods under examination (an approach used by Knack 2001). This is at best, however, a rough approximation, as there is no information in the data about what may have occurred in all the years in between these two periods. At worst, it will give a distorted view of the relationship between two variables. Unless there is a clear and demonstrable reason for doing this, this approach should probably be avoided.

Cross-sectional analysis is also not particularly good at understanding *causative* relationships. This issue can be framed by asking a single simple question: does poor governance lead to lower levels of economic development, or do low levels of economic development hinder a government's ability to maintain robust institutions? Some (Glaeser et al. 2004, for example) maintain what is sometimes called the Lipset view, in that only rich countries can 'afford' good institutions. Therefore causation runs from growth to institutions. Others, such as Rodrik et al. (2004), maintain that it is improvements in institutions that drive increases in incomes. A gathering consensus, however, views the two variables as endogenously determined, in that both are mutually reinforcing. A common approach to test for this is to continue using average growth rates, but to take the governance measure from the *start* of the period in question. The rationale behind this is that governance variables at the start of the sample period cannot possibly be influenced by future growth rates, hence if there is a statistically significant relationship between them then the direction of causation must run from institutions to growth, and not vice versa.[29] This approach has been taken by Svensson (1998), among others.

A more common approach is to use some form of instrumental variable technique, such as two-stage least squares (2SLS). In a standard OLS cross-sectional analysis, all explanatory variables are assumed to be exogenous not only to the dependent variable, but to the other explanatory variables as well. In other words, this assumes that the explanatory variable affects the dependent variable, but not the other way around. If there is the potential for this reverse causality to occur, then the variable is endogenous to the model, and OLS is an inappropriate estimation technique to use.[30] To get around this issue, a common approach has been to use 2SLS by finding an appropriate instrument for the variable at hand. This theoretically overcomes the problem because an appropriate instrument is one that helps explain exogenous variation in the variable being instrumented, but that is uncorrelated with all other variables

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[29] Of course, the governance variable at the start of the period may be influenced by previous growth, which may in turn affect future growth, and so this is only a partial solution.

[30] It is also inappropriate if the explanatory variable is correlated with the error term, which is the well-known 'omitted variable' problem.

used in the model. In the first stage of the regression, OLS is used to regress each variable against the instruments to find the portions of the variables that can be attributed to the instruments. In the second stage the original equation is run using fitted values from the first stage regressions.

The difficulty in governance research, of course, is in finding such an instrument. In many earlier studies it was difficult enough to find an appropriate measure of governance, let alone an instrument for it. However, gradually papers began to include various instruments to try to overcome the problem. Mauro (1995), for example, used Ethno-linguistic Fractionalisation (ELF) as an instrument for his measure of corruption, as well as a dummy variable of colonial history. ELF is a measure of ethnic diversity within a country, and is the probability that two people randomly selected from a population will be from the same ethnic group.[31] Over the years a number of other different institutional instruments have been used, including the fraction of the population speaking English and/or a major European language (Hall and Jones 1999, for example), and income inequality (Rodrik 1997). The series of papers by Acemoglu et al. (2001, 2002, 2003) that introduced settler mortality as an instrument has quickly proven to be the most popular institutional instrument, and has been used in a number of recent papers (Easterly and Levine 2003; Dollar and Kraay 2003; Rodrik et al. 2004). The rationale behind this instrument is that in countries where the mortality rates of colonising settlers were high, the colonial power did not tend to 'lay roots' and take the time and effort to set up a sound institutional framework. The main reason for these high mortality rates was through diseases, such as malaria. Where settler mortality was high, European powers generally set up 'extractive' states, where the main purpose was only to transfer resources from the colony to the colonising country. At the other extreme, where settler mortality was low, the colonising country tried to replicate the institutions that existed in the home country (the main examples of these countries are the so-called 'neo-Europes' of Australia, New Zealand, Canada and the United States). Acemoglu et al. (2001) used this measure as an instrumental variable for the current institutions of countries (based largely on the 'risk of expropriation' measure from the Political Risk Services).

Unfortunately, even if this solves the problem of endogeneity between the governance variable and the dependent variable, the problem is compounded if the governance variable appears alongside other (endogenous) variables. For example, Dollar and Kraay (2003), using different instruments for both institutions and trade,[32] concluded that:

'...since both greater participation in international trade and better institutional quality can be traced back to common geographical and historical

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[31] Although it is often used as an instrument, ELF has also been used as an independent variable in its own right, as some researchers believe it to be an important determinant of growth overall (see, for example, Easterly and Levine 1997).

[32] Specifically, they used the Frankel-Romer instrument of predicted trade shares, and either the fraction of the population speaking English or major European language, or settler mortality for their governance instrument.

factors, it is difficult to disentangle the partial causal effects of institutions and trade separately, using these factors as instruments. This suggests to us that both trade and institutions are important in understanding cross-country differences in growth rates in the very long run, but the available cross-country variation is not very informative about the relative importance of each.' [pp. 160–61]

Even with these problems involving the use of multiple instruments for different variables, the governance instruments themselves have not escaped criticism, and this lack of unanimity over an appropriate instrument is one of the biggest drawbacks to cross-sectional research in this area. Even the settler mortality instrument has been criticised. For example, Glaeser et al. (2004) feel that this may be inappropriate for institutional variables, because what the settlers actually brought with them was not their institutions as such but rather their *human capital*. Further, although it is a 'natural experiment' based on the differing experiences of colonised countries, it does suffer somewhat from the fact that it only covers around 72 countries, and ignores the experience of countries that have never been colonised.

This leads to the second major estimation problem in the empirical literature. Despite the impressive strides made over the years to improve the econometrics of these studies, all of the governance-related measures described above suffer from the fact that they do not have adequate coverage across time (and the few that do, such as the political-type measures, suffer from other problems already alluded to that limit their usefulness as governance indicators). This represents a major 'gap' in the empirical literature, and researchers have long held out the hope that an adequate measure of governance can be found that can be used in panel data studies, which could to some extent negate the need for these instruments in the first place. For example, Gallup et al. (1999) opined that:

'One objective of empirical development studies should be the creation of time series for measures of key institutional determinants of growth (e.g. openness of markets, protection of property rights, etc.) in order to strengthen our empirical tests.' [p. 21]

One of the main benefits in using panel data studies is that there exist specific estimation techniques that allow one to use lagged values of the variable itself as an instrument, rather than having to find an entirely separate variable such as settler mortality. Influenced mainly by the work of Holtz-Eakin et al. (1988, 1989) and Arellano and Bond (1991), the approach requires the use of Generalised Method of Moments/Instrumental Variables (GMM/IV) estimation.[33] It is not the intention here to delve into a detailed analysis of

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[33] Essentially, the data is first-differenced to remove the individual country-specific effects, and then lagged levels of y from $t-2$ and earlier can be used as instruments for the first-differenced y. In other words, for period 3, with $y_{i3} - y_{i2}$ as the dependent variable, y_{i1} is a valid instrument, because it is correlated with $y_{i2} - y_{i1}$, but is uncorrelated with the error term, $v_{i3} - v_{i2}$. For the fourth period, both y_{i1} and y_{i2} are valid instruments, and so on up period T. This estimation technique is now relatively common in the economic growth literature, because it explicitly accounts for the

the specific econometric issues with this model, merely to point out that more sophisticated econometric techniques are becoming available to the empirical researcher.

Unfortunately, the improvements in estimation techniques have not been matched by the necessary improvements in governance variables that would allow governance to be examined in this way, and so researchers are still essentially 'stuck' with using cross-sectional analysis. This has not, however, stopped some researchers from trying.

As Table 2 shows, there are a few studies that have tried to address governance in a panel data context using a number of the variables mentioned in the previous section, including the Freedom House indices (Grier and Tullock 1989; Savvides 1995), the political instability indices (Alesina et al. 1992; Caselli et al. 1996; Campos and Nugent 2003) and ICRG data (Tanzi and Davoodi 1997; Clarke 2001). However, aside from the methodological problems of the indices themselves, many of these papers also suffer from other estimation issues. For example, Chong and Calderon (2000) employed a vector autoregression analysis of Granger-causality developed by Gawecke (1982), which is similar to the GMM dynamic panel data approach, however, this method takes the simple levels of variables without instrumenting them.[34] Even when a more appropriate estimation technique is used, such as Gyimah-Brembong (2002), other problems often arise.[35] Tanzi and Davoodi (1997) use annual data from the ICRG indicator on corruption between 1980 and 1995 to examine the relationship between corruption and the quality of public investment.[36] To do this, they employed a simple panel least squares regression. They did not, however, address the issues of causation or changes in variables in their analysis, preferring to only look at contemporaneous levels of investment and corruption.[37] Another problem here, as it is with other panel data studies such as Clarke (2001), is that they use annual governance data. While governance within countries is not completely invariant over time, it is uncertain that major changes would be observed on an annual basis. Ultimately, it would be preferable to

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fact that there are lagged values of the dependent variable on the RHS of the equation. However, the principle applies to any endogenous variable within the model. Although this is a significant improvement in the treatment of endogenous variables, it is not without its problems. For example, it may be that lagged levels of the variable are not of themselves very good instruments, which would negate the benefits of using this approach.

[34] Specifically, their index incorporated contract enforceability, nationalisation potential, infrastructure quality and bureaucratic delays.

[35] He used the GMM/IV dynamic panel data method to look at corruption, income inequality and growth in Sub-Saharan Africa countries between 1993 and 1999, using data from TI. This is, however a very limited sample (both cross-sectionally and temporally), and while the corruption variable was consistently significant in his analysis, there is little meaningful analysis to be gained from such a short period, and merely serves to highlight the lack of adequate governance data.

[36] They needed to 'splice' together the ICRG index with the BI index in order to get data back to 1980.

[37] Although not reported in their paper, it is quite likely they would have experienced problems with serial correlation, given their focus was on the levels of variables over time. It is not clear whether this was corrected in the analysis.

examine governance issues over 5 or even 10-year intervals (as occurs routinely in empirical economic growth research) to get a better appreciation of how they affect countries over time. This, of course, is not possible with the existing measures of governance. For example, using ICRG currently only allows at most five observations at 5-year intervals (1985–2005), which can make inferences difficult.[38]

5 Concluding comments

The review of the various governance-related indicators in this paper serve to highlight the fact that, even though there may be wide acceptance that 'governance matters', there are still some important methodological issues that researchers need to bear in mind when trying to quantify this relationship. To be fair, searching for a 'perfect' measure of governance is undoubtedly an exercise in futility, and it is unlikely such a measure will ever be developed. Nevertheless, the fact that a perfect measure is unattainable should not preclude us from trying to get as representative a measure as possible. In that sense, the criticisms levelled at many of the indicators mentioned throughout this paper have been written more as a cautionary tale of their limitations, rather than as statements describing why they should never be used. Researchers need to be aware of both the strengths and limitations of these governance measures, and to make sure that they are specific in which aspect of governance they are purporting to investigate, and whether the data they are using is as accurate a representation of this as possible. We have also been careful here not to say definitively which is the 'best' or 'worst' governance measure to use. All we have done is present some of the pros and cons of each, and leave it to the individual researcher to decide which is the most appropriate one for their particular study.

Above and beyond any issues with the governance data employed, researchers also need to pay close attention to the estimation methodology they employ. This, of course, is true in any area of applied economics, however, the development of more appropriate estimation techniques is particularly acute in this area. The fact that governance-related studies now routinely incorporate instrumental variables into their analysis, for example, highlights one relatively recent improvement (despite issues with the instruments themselves). Another promising development in the general macroeconomics literature is the improvement in the estimation procedures for panel data, however, this promise has not as yet been transferred to the governance literature, due largely to the problem of finding a widely-accepted dataset with a long time series component. The search for such an accepted measure is an important area for future research.

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[38] If one uses the Arellano and Bond GMM/IV procedure, one also loses two periods of observations due to the lagged instruments, which would leave only three usable periods for the ICRG data. Using a system GMM procedure, as advocated by Blundell and Bond (1998), which combines levels and first differences into a system of equations, still results in the loss of one period.

Appendix

Table 2 Empirical papers on governance

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Acemoglu et al.	2003	Polity IV dataset (specifically, the constitutional limits on the exercise of executive powers); instrument for institutions (settler mortality rates for colonists) Settler mortality, ICRG	23–68	1970–1997	2SLS	Volatility of macroeconomic policies, leading to lower growth, is caused by poor institutions (modelled through the settler mortality variable)
Acemoglu et al.	2001		64	Various for settler mortality	2SLS	Institutional measure is ICRG 'Protection Against Expropriation Risk', with settler mortality used as main instrument in 2SLS. Conclude institutions explain most of variation in per capita incomes
Ades and di Tella	1999	Business International (corruption index); World Competitiveness Reports 1990, 1991	31–52	1980s and 1990s	OLS/PD (fixed and random effects)	Using corruption measures as dependent variable, against three trade-related variables (share of imports to GDP, share of minerals and fuel exports to GDP and distance to markets). Corruption is higher in countries with a low import share, a higher share of mineral and fuel exports and the further their distance to markets (20 major exporters)
Alesina and Perotti	1993	Socio-political index (SPI), constructed from Barro-Wolf dataset, and includes the number of: assassinations, deaths from mass violence, coups, plus a dictatorship dummy	70	1960–1985	SE	Simultaneous equation model, dependent variables investment and socio-political instability (SPI). Find that income inequality fuels political instability, which then impacts negatively on investment

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation. type	Main result
Alesina et al.	1992	Probability of government change, taken from Taylor and Jodice (1983) and Banks (various)	113	1950–1982	SE (GLS), PD	During periods where there is a propensity for government collapse, economic growth is 'lower than would otherwise be so'. Use simultaneous equations to control for endogeneity
Alfaro et al.	2005	ICRG (Settler mortality used as instrument)	58–98	1970–2000	OLS / 2SLS	Institutional quality is the prime determinant of capital flows and investment across countries
Ali	2001	Various political instability variables, from Taylor and Hudson (1972, 1976), Banks (various). Uses various fiscal, monetary and trade policies as proxies for instability, such as public debt and budget deficits	119	1970–1995	OLS	Traditional measures of instability not significant, but *volatility* of government policies is a significant factor in economic growth
Anderson and Marcouiller	2002	World Economic Forum (1997) Executive Survey (various questions relating to contract enforcement)	Bilateral pairs (2,135 observations)	1996	PD	(Lack of) institutions hamper international trade as much as tariff barriers. Institutions explain why rich countries trade with each other, but developing countries less so
Barro	1991	Coups, assassinations	98	1960–1985	OLS	Coups and assassinations used as proxies for property rights. Both generally negatively significant
Barro	1996	ICRG; BERI; as well as some variables for 'democracy' [Bollen's (1990) Democracy Index; Freedom House Political Liberties Index.]	81–102	1960–1990	3SLS	Rule of Law from ICRG, significant, and causes other ICRG indexes to become insignificant (therefore believed rule of law most important for growth)
Breton	2004	'Bureaucratic efficiency' from Mauro (1995), taken from Business International (1980–1983). Called this 'Government Integrity'	59	1960–1985	OLS/2SLS	Using Mankiw et al. (1992) as base, employed different specifications of education variables. The institutional variable remained significant in each regression

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Brunetti and Weder	1995	World Development Report Survey (1997), used to construct a 'Credibility Indicator'; Freedom House Political Liberties; ICRG; assassinations, coups, wars (from Easterly and Levine 1997)	28	1980–1990	OLS	Growth as a function of many common variables (schooling, investment etc, and policy credibility). Policy credibility a significant, robust variable
Brunetti et al.	1998	World Development Report Survey (1997), used to construct a 'Credibility Indicator'; Freedom House Political Liberties; ICRG; assassinations, coups, wars (from Easterly and Levine 1997)	51–73	1980–1992	OLS	'Credibility' significant in all regressions except (i) when a measure of financial depth included as well and (ii) when ICRG measure included as well. High degree of correlation between credibility, financial depth and ICRG measure
Bulte et al.	2005	KKZ (Rule of Law and Government Effectiveness)	66–90	1970–2001	OLS	The 'resource curse' affects development indirectly, through its effects on institutional quality, and depends on the type of resource
Burnside and Dollar	2004	ICRG; Freedom House Political Liberties; Kaufmann et al. (1999) governance dataset	124	1980–1989, 1990–1999	OLS/2SLS	Aid generally works better in countries with better institutions, but occasionally this link is not significant
Campos and Nugent	2003	SPI (assassinations, revolutions and successful coups)	94 developing countries	1960–1995 (5 year averages)	PD (Anderson-Hsiao)	Investment to GDP ratio. Using Granger causality, found that SPI had a significant, *positive* effect on investment (higher SPI in previous period led to higher investment in current period
Caselli et al.	1996	Revolutions, assassinations (used as a proxy for poor property rights)	85–93	1965–1985	PD (GMM)	Using GMM panel data estimation, found assassinations to be a significant (negative) determinant of growth. Revolutions actually had a (marginally) positive effect on growth

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Chong and Calderon	2000	BERI, ICRG (Institutional Quality)	35–110	1972–1995	PD (see Gawecke et al. 1982)	For poorer countries, causation runs from institutions to growth, but reverse causation also apparent (for full sample, causality from growth to institutions is stronger)
Clague et al.	1996	Contract Intensive Money (CIM); ICRG; BERI; index of democracy (1 = dictatorship, 2 = almost dictatorship, 3 = intermediate category, 4 = almost democracy, 5 = democracy)	Various	1969–1990	OLS, fixed effects panel data	Various dependent variables used (including CIM, ICRG, BERI, Black Market Premium, currency depreciation and credit risk) as a function of regime type and income Evidence suggests the longer the duration of the regime, the more secure the property rights, but long-lasting democracies have better property rights than long-lasting autocracies
Clarke	2001	ICRG (Risk of Expropriation, and Rule of Law)	Various	1983–1995	PD (fixed effects)	Better institutional quality is associated with higher Research & Development expenditure in developing countries
Cukierman et al.	1992	Government changes, unsuccessful coups, executive adjustments, riots, political executions	79	1971–1982 (PI data 1948–1942)	OLS/pooled probit to obtain PI index	The amount of government revenue earned through seigniorage is positively related to the level of political instability
Dawson	1998	Economic Freedom (from Gwartney et al. 1996)	85	1975–1990	OLS/3SLS	Economic freedom index effects growth through TFP, as well as through investment and human capital
Dawson	2003	Economic Freedom Index (Gwartney et al. 1996)	Not stated	1970–2000	PD (Gawecke)	Overall economic freedom precedes growth, but individual components have mixed causality with growth

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
De Groot et al.	2004	KKZ (all 6 categories)	Bilateral trade pairs (varies, but between 8 and 10,000 observations)	1998	Gravity equation model	Countries tend to trade with other countries that have similar institutional quality, while trade is also (independently) affected by the level of institutional within the domestic country
De Haan and Siermann	1996	Freedom House Political Liberties index. Dummy variable of Political Liberties (1 = score > 3, 0 otherwise)	97	1963–1988	OLS	No significant relationship found with Political Liberties, except marginally for Latin America (in Asia more repression = higher growth)
Dollar and Kraay	2003	KKZ measures	Various	1995	2SLS/PD (see Caselli et al. (1996)	Similar analysis to Rodrik et al. (2004). Due to poor instruments, results not robust (i.e. instruments used for institutions also correlated with trade, while instruments used for trade correlated with institutions
Easterly and Levine	1997	Political assassinations	41–96	1960–1989	SUR (decade averages)	Ethnic diversity a major determinant of political instability (in Sub Saharan Africa), which then impacted on economic growth
Easterly and Levine	2003	Average of six KKZ Governance measures	Various	Various for mortality, 1995 for GDP, 1997/8 for KKZ	2SLS	'Endowments' (geography, settler mortality) explain differences in per capita incomes only to the extent that endowments influence institutions, which then influence incomes
Easterly et al.	1993	War-related casualties	45	1960–1989	PD (decade averages)	Looks at temporary 'shocks' as an explanation of short run economic growth (terms of trade, and wars). War-related casualties have a significant short run effect on growth

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Edwards and Tabellini	1991	Frequency of government changes and coups	21–44	1963–1988	OLS	Political instability and polarisation are important factors in explaining cross-country differences in inflation, seigniorage and budget deficits
Feierabend and Feierabend	1972	Index of Regime Coerciveness	84	1948–1960	–	Uses average economic growth as the dependent variable, but find no statistically significant relationship between growth and 'coerciveness' after taking into account the level of development
Fosu	1992	Successful and unsuccessful coups	31 (Sub Saharan African countries)	1960–1986	OLS	Abortive coups, rather than successful coups, had the most adverse effect on growth over period. Main channel is through effect on marginal productivity of capital
Gallup et al.	1999	ICRG from Knack and Keefer (1995)	97	1995	OLS/2SLS	Dependent variable per capita income in 1995, institutional measure significant, but with a t-stat roughly half that of the malaria index, and trade openness
Glaeser et al.	2004	ICRG, KKZ and Polity IV	Various	1960–2000, plus long-term growth (1870–1950)	OLS/2SLS	Current institutional measures do not reflect 'deep' determinants, and human capital is a more persistent and long-term determinant of growth
Grier and Tullock	1989	Freedom House Civil Liberties Index (dummy variable)	89 LDCs, 24 OECD	1961–1980, 5 year averages	PD	Civil Liberties significant for Africa and the Americas, but not Asia

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Gupta	1990	Index constructed, which included: riots, political demonstrations, political strikes, deaths, armed attacks, assassinations, political executions, coups and attempted coups	104	1960–1982	OLS, SE	Income inequality is a leading cause of political instability and hence lower growth (the larger the proportion of the middle class, the less political instability)
Gwartney et al.	2004	Economic freedom index	91–99	Per capita income in 2000, Growth 1980–2000	OLS	Economic freedom impacts on both income levels and growth rates. Also affects the rate of investment as well as productivity. Also some causal interpretations, that changes in economic freedom take 5–10 years to impact on income
Gyimah-Brembong	2002	Transparency International (ELF and settler mortality used as instrument in cross-section)	21 (African countries)	1993–1999	PD (GMM)/ OLS and IV	Significant effect of corruption on both growth and investment, as well as increasing income inequality. However, small sample size and limited time period cause for concern (annual data used in panel data)
Gyimah-Brembong and Traynor	1996	Index of political instability, including: coups, guerrilla warfare, secession movements, assassinations, revolutions, riots, government crises, purges, constitutional crises, demonstrations, strikes, plots	38 (Sub Saharan Africa countries)	1975–1989	PD (pooled)	Simultaneous equation model (dependent variables: savings, political instability, economic growth and investment). Political instability treated as endogenous. Found that an increase in PI decreased savings, which then decreased growth (also some direct effects of PI on growth)
Hall and Jones	1999	ICRG (as per Knack and Keefer 1995) as part of 'Social Infrastructure' variable	79–127	1988	2SLS	Social infrastructure accounts for the majority of the differences in per capita output between countries (much larger than differences in physical and human capital)

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
		Instrumental Variables used included fraction of population speaking English, or other European language, Ethno-linguistic fractionalisation, Frankel-Romer trade instrument, distance from equator				
Hibbs	1973	Riots, political demonstrations, political strikes, armed attack events, assassinations and deaths from political violence (combined to form a 'Collective Protest' variable, and an 'Internal War' variable)	108	1948–1967	OLS, 2SLS	Economic growth tends to avert 'Collective Protest', but does not affect 'Internal War'. Improved institutions lower Mass Political Violence
Hines	1995	Business International	35	1966–1982	OLS	Investigates the extent to which anti-corruption legislation in the US affected US firms' Foreign Direct Investment in other countries. Found that while US FDI to more corrupt countries fell, there was no evidence that bribery in these countries was reduced (other foreign countries merely 'took up the slack')
Isham et al.	2005	KKZ (each one individually), ICRG (Rule of Law, Bureaucratic Quality), Civil and Political Liberties, CPIA from World Bank (plus instruments such as settler mortality and language)	90 LDCs	1957–1974, and 1975–1997	3SLS	Compares two periods looking at performance of resource-rich countries versus other countries between two periods. Being dependent on natural 'point' resources lowers institutional quality which makes adjustment to external shocks difficult

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Knack and Azfar	2003	KKZ (Graft), TI Corruption Perceptions Index, World Bank's CPIA	40–162	1995–1999	OLS	With corruption indices as dependent variable they find that increasing the sample size (using KKZ and CPIA) to include smaller countries causes the coefficient on trade intensity (natural openness) to fall substantially, and is no longer significant [as in Ades and di Tella (1999) or Wei (2000) for example]
Knack and Keefer	1995	Business Environmental Risk Intelligence; ICRG	46–97	1974–1989	OLS	Significant for growth and investment, even when run with many of Barro's 'idiosyncratic' factors
Knack and Keefer	1997	World Values Survey (CIVIC and TRUST, measuring 'social capital')	21–28	1980 (21 countries), 1990–2001 (28 countries)	OLS	Both CIVIC and TRUST significant against growth even when other additional variables included. However, not significant when investment included (transmission therefore from social capital to investment to growth)
Knack and Keefer	2002	ICRG	64–108	1986–1995, 1972–1992	OLS	Transmission mechanism runs from 'social polarisation' (income and land inequality, and ethnic tensions) through to a reduction in contract and property rights, which then reduce growth
Kormendi and Meguire	1985	Freedom House Index of Civil Liberties	47	1950–1977	OLS	Marginally significant impact on growth, much larger impact on investment
Lambsdorff	2003	Various, including: Transparency International; ICRG; Freedom House Political and Civil Liberties (corruption viewed in terms of its 'sub-components' of bureaucratic quality, law and order, and civil liberties, among others)	55–64	1970–1995	OLS/2SLS	Divided investment between that from domestic savings versus capital inflows from abroad. Found a significant effect on capital inflows, but only through rule of law variable (bureaucratic quality, civil liberties and government stability were not found to be important)

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Landau	1986	Own Democracy Index (1 = Democratic, 2 = Non-democratic); coups	65	1960–1980	OLS	Effects of government on economic growth. Looked among other things at expenditure (net of education and military expenditure) and revenues. In terms of political factors, found that political stability 'clearly' fostered growth
Levchenko	2004	KKZ (Rule of Law)	81–117	1998 (for US imports), various for other variables	OLS	Countries with better institutions capture larger import shares in industries that are more 'institutionally complex'. There is a 'race to the top' as countries try to improve their institutions to capture a greater share of this trade in more elaborate goods
Levine and Renelt	1992	Freedom House Civil Liberties; revolutions and coups	83	1960–1989	OLS	Civil liberties not robustly significant for growth, but revolutions and coups robustly significant for investment
Marsh	1988	Freedom House Civil and Political Liberties	55	1970–1978, 1965–1984	OLS	No significant relationship with growth using Civil and Political Liberties indices
Mauro	1995	BI (selective sub-indices, including corruption, red tape, legal institutions and political stability)	41–67	1960–1985	2SLS	Corruption significant for growth and investment. Includes 2SLS regressions, using ELF and colonies as instruments for corruption. Still significant
Mauro	1998	ICRG	28–106	1970–1985	OLS, others.	Government spending components as a % of GDP (various, including education, defence, social security and transfer payments). Corruption associated with lower spending on education

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Naude	2004	Corruption and Regulatory Burden (KKZ), Settler mortality	17–20 SSA countries	1970–1990	OLS/LAD/GLS/GMM	Incorporates both geography and institutional measures into regressions for Sub-Saharan Africa, find support for settler mortality hypothesis, but not KKZ indicators in GMM panel data regressions
Ng and Yeats	1999	TI and the Wall Street Journal – Heritage Foundation (1997) measure of governance	80 LDCs, 28 SSA countries	1996	OLS	Using a 'speed of convergence' index from the World Bank as the dependent variable, they modelled both institutional and trade policy variables. Found that although both institutions and trade policies were important, it was the institutional factors that were the prime determinant of growth here
Ozler and Tabellini	1991	Probability of government change; indicator of democratic regimes; index of PI (political assassinations, armed attacks, deaths from political violence, executions, protests, riots, strikes and government sanctions)	55	1972–1981	PD	Political instability has a positive effect on the demand for sovereign debt (that is, more unstable regimes are likely to borrow more money)
Ranjan and Lee	2005	ICRG (Contract enforcement), Index of Contract Enforcement (Heritage Foundation), KKZ	Bilateral pairs (5,514–6,520 observations, depending on institutional measure)	1992	OLS/2SLS/PD (random effects)	Measures of contract enforcement highly significant for 'differentiated' export goods (i.e. those that have the most complex characteristics)

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Rauch and Evans	2000	Own survey on bureaucratic structure, filled out by country experts	35	1970–1990	OLS	Bureaucratic quality and corruption (various measures). Meritocratic recruitment is a significant determinant for 2 of 3 datasets on bureaucratic quality, but competitive salaries, internal promotion and career stability not significant
Rigobon and Rodrik	2005	KKZ Rule of Law, Knack and Keefer (ICRG)	North–south vs east–west sample, and a colony-not -colony sample	86	'Identification through Heteroskedasticity' (IH)	Democracy and the rule of law are both good for economic performance. Trade openness has a *negative* impact on income levels but a *positive* effect on rule of law. Higher income produces greater openness and better institutions, but these effects are not very strong
Rodriguez and Rodrik	1999	ICRG (Knack and Keefer 1995)	69–74	1970–1989	OLS	Used in respect to the Sachs-Warner openness measure. Show that the Black Market Premium used in the openness measure highly related to institutional measures (when only ICRG and openness included the t-stat on openness falls by half and is no longer significant)
Rodrik	1997	ICRG (Knack and Keefer); BERI (ELF and income inequality used as instruments for bureaucratic quality)	8 (East Asia)	1960–1994	2SLS	Institutional measure very good at ranking economic performance of eight countries over period, and is main determinant of performance for these countries

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Rodrik	1999	ICRG (Bureaucratic Quality), Index of Democracy (based on Freedom House Civil and Political Liberties)	48–110	1960–1975, and 1975–1989	OLS	Looks at external shocks, social conflict and institutions against growth differential between two periods (1960–1975, and 1975–1989). Both external (ToT) shocks and social conflicts (income inequality) initially significant, then both insignificant when ICRG measure included
Rodrik et al.	2004	Settler mortality, KKZ measure of institutional quality	64 (settler mortality), 140 for others	Various for mortality, 1995 for GDP, 2002 for KKZ	2SLS	'Horse race' between trade, geography and institutions, using per capita GDP in 1995 as dependent variable. Using 2SLS, trade and geography become insignificant, while institutions always significant. See Dollar and Kraay (2003) for possible reason for this result (poor instruments)
Roubini	1991	Frequency of government change, regular and irregular (coups), 1971–1982	92	1950–1988	OLS	In overall measure of political instability, greater political instability is significantly associated with higher budget deficits. Breaks index into government change and coups, and finds coups not significant. Concludes military governments are therefore not more likely to run higher deficits than democratic governments
Sachs	2003	KKZ (Rule of Law, and all combined), ICRG Risk of Expropriation	59–133	1995	2SLS	Used to refute papers by Acemoglu et al. (2001), an early version of Rodrik et al. (2004) and Easterly and Levine (2003) that 'institutions rule'. Uses a malaria index as instrument, finds that *both* institutions and geography are significant when regressed against per capita incomes in 1995

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Sachs and Warner	1995a	Political variable made up of Freedom House Civil and Political Liberties and instability variables political	117	1970–1989	OLS	Political variable marginally significant, but not revolutions/coups or assassinations (when entered with trade openness and other variables used by Barro (1991)
Sachs and Warner	1995b	Business International ('Bureaucratic Efficiency' index compiled by Mauro 1995); ICRG Rule of Law	Various	1970–1989	OLS	Natural resource abundance remains a significant negative determinant of growth even after accounting for institutional measures
Sachs and Warner	1997	ICRG (Knack and Keefer)	Various	1965–1990	OLS	Sources of slow growth in Africa are not 'Africa-specific' – factors such as trade openness and institutional quality are significant for *all* countries, not just Africa
Sachs and Warner	2001	ICRG (Knack and Keefer)	93–97	1970–1989	OLS	Focussed more on geography variables, showing that even with these geography variables included, natural resource exports still associated with lower growth over period
Sala-i-Martin	1997	Civil and Political Liberties; ICRG Rule of Law; revolutions and coups, war dummy	Various	1960–1992	OLS	All these found to be 'robust' for economic growth (robust meaning had a t-stat of at least 2 in 95% or more of the regressions run)
Savvides	1995	Combined Civil and Political Liberties index ('FREE')	28 SSA countries	1960–1987	PD (FE)	Found their 'FREE' variable to be highly significant, using fixed effects model (NOTE: no instruments used)
Scully	1988	Freedom House Civil and Political Liberties	115	1960–1980	OLS	On average, societies that subscribe to the rule of law grew at 2.75%, compared to 1.23% for societies where state rights take precedence. Overall, countries with high incidence of political, economic and civil liberties grew at 2.73%, while those with poor liberties grew at only 0.91%

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Sloan and Tedin	1987	Own Democracy Index (1 = Democratic, 2 = Bureaucratic–Authoritarian, 3 = Communist, 4 = Traditional Authoritarian, 5 = transitional)	20	1960–1980	OLS/GLS	Look at relationship between regime type (and age) and various areas of public policy (external debt, agricultural production, military expenditure, GDP per capita and inflation). Significant relationship found for each, while age of regime also occasionally had an additional effect on public policies
Svensson	1998	Business Environmental Risk Intelligence; ICRG; government changes	101	1960–1985	OLS	More politically unstable countries will have poorer property rights, which leads to lower investment
Tanzi and Davoodi	1997	Business International; ICRG	42–95	1980–1995	OLS (annual data pooled)	Higher corruption should lead to higher public investment in areas where bribes easier to extract, and lower spending on maintenance of infrastructure. Found significant positive relationship between corruption and public investment, and significant negative relationship between maintenance spending and corruption
Torrez	2002	TI, ICRG	Various	1980–1985 (TI), 1982–92 (ICRG)	OLS	Higher corruption (when using TI) significantly associated with lower trade openness (various definitions). Not significant when using ICRG
Treisman	2000	TI and BI	36–81	1996–1998 for TI, 1980s for BI	OLS/WLS	Corruption is associated with a number of factors, including trade openness (measured as ratio of imports to GDP). Significant for TI in 1996 and 1997, but not 1998 (see Knack and Azfar 2003, for possible reason why)
Van Rijckeghem and Weder	1997	ICRG; Freedom House Civil and Political Liberties	22–28	1982–1994	WLS/PD	Corruption (as a function of explanatory variables such as civil service pay, internal and external controls, penalties for corruption and other variables such as ethnic diversity and cultural factors)

Table 2 continued

Author(s)	Year of publication	Main institutional data source	Country coverage	Time frame	Estimation type	Main result
Venieris and Gupta	1983	Socio-political index (protest demonstrations)	104	1967	SE	Simultaneous equation method Gross capital formation Population Per capita GNP growth rate Socio-Political Index For a country with the mean level of instability, they would need an exceptionally large investment ratio to achieve strong growth
Wei	2000a	Composite index, derived from various sources, including ICRG, Global Competitiveness Report (1997) and World Development Report (1997)	Country pairs (source country lenders to host country borrowers)	1994–1996 (average)	OLS	Hypothesis is that higher corruption means greater reliance on short-term foreign borrowing ('hot money') than foreign direct investment. Finds this result significant, and robust
Wei	2000b	Business International (average 1980–1983), Democracy dummy; Transparency International (1998)	126	1978–1980 and 1994–1996	OLS	Countries that are 'naturally' open (due to geography or size) have better institutions, and pay their civil servants a higher wage
Wei and Kaufman	1999	3 surveys: 1996 Global Competitiveness Report, 1997 Global Competitiveness Report and 1997 World Development Report	Various	1996/7	OLS	Bribery does not 'grease' the wheels of commerce, as firms paying bribes spend more time and money with bureaucrats, not less
Wheeler and Mody	1992	Business International (Political Risk, derived using principal components)	42	1982–1988	PD	Capital expenditure as a function of many variables, including domestic Political Risk. Found no significant relationship (NOTE: no instruments employed, nor fixed effects)

OLS Ordinary least squares, *2SLS* two stage least squares, *3SLS* three stage least squares, *LAD* Least absolute deviation, *GLS* Generalised least squares, *WLS* Weighted least squares, *SE* simultaneous equation, *GMM* Generalised methods of moments estimator (panel data), *PD* panel data, *SUR* Seemingly unrelated regression

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