Federalism, decentralisation and corruption

Sebastian Freille and Mohammad Emranul Haque and Richard Anthony Kneller

Universidad Nacional de Cordoba, University of Manchester, University of Nottingham

June 2007

Federalism, decentralisation and corruption

Sebastian Freille*   M Haque   Richard Kneller

June 2007

Abstract

We investigate the empirical relationship between decentralisation and corruption. Using a newly assembled dataset containing data for up to 174 countries, we revisit the empirical evidence and seek to explain some of the inconsistent results that exist in the literature. We find that not only results differ due to the use of different specifications and data but more importantly because previous research overlooks the relationship between different dimensions of decentralisation. We propose an approach aimed at exploring the aggregate effect of decentralization on corruption. In this context, we analyze the existence of direct and indirect effects of these aspects on corruption. Our results suggest that fiscal (market) decentralisation is associated with lower corruption. However, we also find that constitutional decentralisation (federalism) is associated with higher corruption. Furthermore, we find that certain forms of political decentralisation worsen the positive effect of constitutional centralization on corruption. Finally, other forms of decentralisation such as spatial decentralisation do not appear to have a strong association with corruption. Our results suggest the possibility that previous empirical work may grossly overestimate de aggregate impact of decentralization and corruption.

Keywords: Fiscal decentralisation; Corruption; Federalism;Unitarism; Political institutions.

JEL Codes: H10, H40, H70, 01O

*Room C36, University Park, University of Nottingham, NG7 2RD, Nottingham, UK. mailto:lexsf@nottingham.ac.uk

1 Introduction

In the past 30 years the number of federal states has increased. Among industrialized countries, Spain and Belgium have joined Australia, Canada, Germany, Switzerland and the United States. Similarly, Italy agreed to a federalist turn after a Constitutional reform in 2001. Developing countries are also becoming more federal: Brazil and Ethiopia have already embraced a federal arrangement, federalism is well under way in Uganda, Indonesia and Sri Lanka and the transition to a federal form of government has already been started in Iraq and Sudan. Although the motivations in each case respond to different factors, there are certain common elements behind this trend. One such element is the view that centralised governments encourage rent-seeking behaviour and therefore lead to higher levels of corruption[1] [Bardhan and Mookherjee (2000)]. The theoretical literature on this topic would suggest however that such a simple view of the policy choice available is misplaced. The relationship between decentralisation and corruption is complex: decentralisation is multifaceted and can give rise to mixed predictions. Under some conditions centralised governments are more corrupt whereas under some other definition of decentralisation they are more corrupt[2].

Because of the reasons mentioned above, it is not surprising to observe a number of apparent inconsistencies in the empirical literature of decentralisation and corruption[3]. For instance, while some papers find evidence that federal countries have higher corruption ratings [Goldsmith (1999), Treisman (2000), and Wu (2005)], several other scholars have found that fiscal decentralisation is associated with lower corruption [Fisman and Gatti (2002), Barenstein and de Mello (2001)]. In theory, federal states are not necessarily fiscally decentralised states, although it seems that there exists a positive association between these. According to Ebel and Yilmaz (2002), the average sub-national share of expenditures is 38% for federal countries and 22% for unitary countries. However, there are examples of

---

[1]Other important motivations for favouring a federal structure are the presence of strong ethnic minorities and national identities; the existence of considerable regional inequalities and the strengthening of local democratic institutions. For a more detailed insight of the causes of decentralisation see Rondinelli (2006)

[2]For an excellent survey on the theoretical and empirical contributions to the literature see Fjelstad (2004).

[3]Methodological issues and conceptual problems are also important and contribute to generate inconsistencies and make comparison difficult. For an excellent discussion about these problems see **?**

traditionally unitarist countries with a high degree of fiscal decentralisation. This is the case of the Scandinavian nations where sub-national expenditures represent over 30% of total government expenditures. The UK, embracing the devolved state model, is another example with sub-national expenditures averaging 23% during the 90's. At the other end, certain federal countries have a low degree of fiscal decentralisation: some notable examples are Croatia and Indonesia with only around 10% of their total government expenditures accounted for by sub-national governments.

Other studies focus on different aspects of decentralisation, such as political or administrative decentralisation. Based on long-standing political science theories, it has been argued that political decentralisation is important to improve accountability at the lower levels but the empirical evidence is inconclusive and often contradictory. Among those who find that accountability is improved with the existence of political decentralisation are Ames (1994) and Samuels (2000). Other authors find no significant evidence of such relationship [Gelineau and Remmer (2006)]. Additionally, some papers have found evidence that administrative decentralisation[4] within the public sector is associated with lower corruption [Wade (1997), Kuncoro (2004)].

In this paper we try to bring the empirics closer to the theory by acknowledging the several different dimensions of decentralisation and by taking a closer look at the empirical relationships among them. In so doing we build on a small recent literature that recognises this point. Treisman (2002b,a) provides a systematic treatment of the issue, carefully defining different types of decentralisation and providing measures for each of them. Recognising the importance of their joint effect on corruption he finds some direct effects but no interaction or indirect effects. Our study has a closer relationship with Enikolopov and Zhuravskaya (2007) however who test whether the effects of one of the aspects of decentralisation we also consider, fiscal decentralisation, on corruption depend on the existence and type of political institutions. In particular, they analyse how the level of political centralisation modifies the effect of fiscal decentralisation on corruption. They find evidence from this approach that strong party systems improve the result of fiscal decentralisation on corruption and that political centralisation along with

---

[4]On the field of administrative decentralisation, ?ścohen96 provide conceptual elements, highlight links with other dimnesions and identify strategies of administrative decentralisation.

market decentralisation improves government quality for a sample of developing countries. This evidence offers support for some long-standing political theories of decentralisation.

Our work raises the following issues:

- Based on theoretical explanations, which decentralisation measures are important?

- Are there multi-dimensional aspects?

- Are there any significant interaction effects?

- What is the aggregate effect of decentralisation on bureaucratic corruption?

We contribute to this recent literature both by recognising and measuring the existence of different dimensions of decentralisation but we also examine some hypotheses in order to provide a sensible econometric model. We collect a large set of decentralisation indicators -many of which have been used alternatively by earlier research- and group them into categories in order to re-examine the relevant empirical literature in a different light. Interestingly, we find evidence of heterogeneity in the relationship between decentralisation and corruption regardless of the decentralisation measure used. Furthermore, unlike earlier research we argue and find that some types of decentralisation are simultaneously associated with corruption through both direct and indirect effects. We do not explore the co-evolution of these dimensions of decentralisation[5].

Our finding that long-standing unitary countries (constitutional centralisation) which are also fiscally decentralised have low corruption is to some extent present in earlier research. But unlike previous work, we find these two dimensions of decentralisation significantly associated with corruption *simultaneously*. This result is quite robust both in terms of a variety of specifications and controls used and in terms of alternative decentralisation measures. Furthermore, we also find

---

[5]Unfortunately, we were not able to analyse time-varying features of the relationship between corruption and decentralisation. Although we have data on corruption and other control variables since 1975, there are almost no time-series data for decentralisation indicators. Apart from annual dummies of no use in panel-data methods, the only decentralisation measures with time-series data are *exp* and *rev*. The problem with these is that the sample of countries suffers significant variations throughout the 25-year period.

evidence suggesting that political decentralisation -in particular, the existence of municipal elections- is also associated to corruption but only indirectly through its effect on constitutional decentralisation. In particular, political decentralisation worsens the impact of constitutional centralisation on corruption. This result is similar to Enikolopov and Zhuravskaya (2007) who find a negative indirect effect of political institutions on corruption.

The remainder of the paper is organised as follows. In the next section, we review the theoretical background of decentralisation and federalism, define the different dimensions and explore the interrelations and overlaps between these dimensions. Section 3 details the data and the empirical strategy followed. Section 4 presents and discusses the main results. We also analyse different hypotheses regarding the joint impact of different dimensions of decentralisation on corruption. Section 5 concludes.

2   Decentralisation and theory

To motivate the empirical analysis we provide a review of the literature on decentralisation and corruption. Using a well-known approach[6], we define four different types of decentralisation.

Market Decentralisation[7]**.** Usually associated with the traditional theory of fiscal federalism rooted in the public finance literature[8], this form of decentralisation is concerned with the study of the conditions required for the existence of market mechanisms for the production and provision of goods and services. Based on ideas developed during the 50's, Oates (1972) shows first that in a multi-level government situation where at least some public goods have regionally-bounded benefits, decentralised finance provides opportunities for gains in social welfare. Even in the presence of inter-jurisdictional externalities, decentralised provision creates a better outcome as opposed to a uniform centralised provision of public

---

[6]The categorisation follows loosely the Type-Function Framework. This is the currently dominant approach to define and divide the different forms and types of decentralisation and is largely based on the work of Cheema, Nellis and Rondinelli. An overview of the Type-Function Framework given in **?**

[7]In this paper, we use the terms market decentralisation and fiscal decentralisation indistinctively

[8]See Oates (2005) for references and summary of major contributions to this literature

goods. Second, there is an informational asymmetry: local governments are better informed about the local preferences than the central government; this is also known as the preference-matching argument for fiscal decentralisation. Third, there is Tiebout's 'voting-with-the-feet' idea that citizens will sort themselves into homogeneous communities demanding the same local public goods [Tiebout (1956)]. Finally, the existence and enforcement of hard-budget constraints should encourage local and regional governments to find ways to generate and rely on their own sources of revenue. On the contrary, if the local and regional governments customarily receive transfers from the centre or there are soft budget constraints, it is likely that efficiency levels will drop. Taking these arguments together, we would expect the scope for bureaucratic corruption to be lower in the presence of market decentralisation. In principle, intergovernmental competition to attract residents lowers the incentive and ability to extract rents and bribes. Moreover, the existence of hard-budget constraints reduces the scope for corruption since local governments are entirely responsible for financing their own expenditures.

In spite of the previous considerations, there remain theoretical arguments that suggest that forms of market decentralisation, such as fiscal decentralisation, may create perverse incentives and stimulate corrupt behaviour. For example, because of over-budgeting and lack of accountability in the case of soft-budget constraints arising from tax evasion and unconditional intergovernmental grants. This situation may be particularly relevant in cases where there is no political decentralisation. Another possible factor that may distort incentives is the way sub-national budgets are financed. Barenstein and de Mello (2001) have suggested that the relationship of fiscal decentralisation to corruption hinged on the way sub-national expenditures are financed.

Political Decentralisation. There is perhaps no better description of the difficulties in defining centralisation than Alexis de Tocqueville's observation that "*Centralisation* is now a word constantly repeated but is one that, generally speaking, no one tries to define accurately"[9]. Alongside Montesquieu and philosophers from the Enlightenment, de Tocqueville's ideas on federalism and decentralisation generated vigorous research effort to study the advantages and disadvantages of political decentralisation. The central idea of political decentralisation (or gov-

---

[9]Alexis de Tocqueville, Democracy in America, Vol. 1, Part 1, ch. 5.

ernment decentralisation as is also called) is that citizens should be given more power in political and public decision-making. This involves the creation of a number of different institutions that support this objective. Local and regional elections, regional autonomy, local committees and civil associations, sub-national authority over taxation, spending and legislation, are all different mechanisms involved in the context of political decentralisation. There are several arguments favouring political decentralisation. The most commonly cited are the greater accountability to the local and regional electorate, the development of a civic local culture by fostering democratisation and the involvement of other local actors in the decision-making process (NGO's, civil and professional associations, private sector, etc.).

Despite these theoretical arguments endorsing political decentralisation, others have highlighted the potential dangers associated to political decentralisation. One of the most notable contributions is the work of Riker (1964), who provided strong theoretical arguments in favour of political centralisation. The basic idea is that political centralisation may serve as a mechanism to complement and boost the outcome of fiscal decentralisation by making local politicians internalise inter-jurisdictional externalities to a greater extent. Alternatively Bardhan and Mookherjee (2000) argue that political decentralisation may not be as effective if local capture of public officials by interest groups is widespread.

Constitutional Decentralisation[10]. The concept of constitutional decentralisation (or equivalently constitutional federalism) is closely associated with what is known as *de iure* federalism, representing the establishment of a federal regime by the Constitution. There is however, in addition the concept of contingent decentralisation, which refers to our current understanding of federalism as including the erosion and degradation of the constitutional decentralisation principle by jurisprudence and/or Courts rulings [Aranson (1990)]. In words of this author, *"Federalism as constitutional decentralisation differs from federalism as contingent decentralisation in that the authority of the states under constitutional decentralisation is guaranteed as a matter of organic, constitutional law. Neither prudential nor political judgments or decisions taken at the national level can overturn such*

---

[10]We refer to constitutional decentralisation as the Constitution's federalism, the legal doctrine. This expression was originally introduced by Diamond (1969) in his article about the relationship between federalism and decentralisation.

guarantees in the face of the appropriate legal fidelity to the original constitutional arrangement" [Aranson (1990), p. 20]. One connotation derived from this distinction is that constitutional decentralisation is a rather static concept while contingent decentralisation is inherently dynamic. In general, constitutional and contingent decentralisation will differ: contingent decentralisation is driven by pure utilitarist motives and this will shape the distribution of powers and federal arrangements in practice. Aranson (1990) shows the widening gap between these two concepts but in general it has happened in several other federal countries. It may be even argued that contingent decentralisation will eventually cause a country to re-centralize if many judicial or consuetudinary instances erode the true nature and spirit of constitutional decentralisation. At the empirical level, however, distinguishing between these two types of 'federalism' is not practicable and only constitutional decentralisation measures can be used.

What are the predictions of the theory for the relationship between constitutional decentralisation and corruption? Similarly to the case of political decentralisation the answer is not clear. Constitutional federalism has often been advocated as a system to accommodate ethnic and religious differences and other regional divergences [Bermeo (2002)]. Federalism provides room for diversity and reduces the possibility of tensions and conflicts which may also originate opportunities for the extraction of rents. Yet on the other hand, the well-known arguments of multiplication and overlapping of layers of government causing accountability problems and the 'overgrazing' of the bribe base in federal systems suggests that the latter may also be associated to higher corruption.

Spatial Decentralisation. This form of decentralisation refers to the actions and strategies aimed at encouraging the development of regional growth poles outside major urban areas. If succesful, this has obvious implications for the distribution of the size of cities. In political economy, it is usually associated with a narrower concept and known as structural or vertical decentralisation. For example Treisman (2002b) suggests that structural decentralisation refers to the number of tiers of government. Essentially, the greater the number of tiers the more decentralised a country is. This definition gives only a partial and crude account of this type of decentralisation as it only considers the number of levels of government and not the number, size and density of cities.

Spatial decentralisation is likely to be related to other forms of decentralisation, most evidently with constitutional decentralisation. In fact, it is possible that with several tiers of government, only some may have the constitutional authority over certain decisions (i.e. spending, taxing, legislation, etc.) or be responsible for their own sources of revenues and expenditures. The definition given by Treisman defines a tier as having a political executive in charge of certain decisions over a territorial jurisdiction. It is also clear from this that spatial and political decentralisation may be closely linked. Other measures, including the number of cities at the intermediate and local level, may be also considered as representing aspects of spatial decentralisation.

3 Data and sample characteristics

The empirical approach adopted in the paper builds the relationship between decentralisation in stages. In the first stage we try to identify which measures of the different aspects of decentralisation are correlated with corruption. As a second stage we then consider the multi-faceted nature of decentralisation, and attempt to establish the robustness of the results in the first stage to other aspects of decentralisation. Finally, we allow for the possibility that there may be interesting interactions between the various measures of decentralisation.

In this section we describe and motivate the choice of regression model that we use in the first stage of the empirical analysis and summarise the main characteristics of the data. The baseline model we adopt in the paper is given by a standard corruption equation. It regresses a measure of corruption against a series of control variables usually included in any corruption regression [Treisman (2000); Serra (2006)] and a series of decentralisation measures:

$$CORR_i = \beta_0 + \beta_1 DEC_i + \beta_2 \log GDP_i + \beta_3 \log POPUL_i + \beta_4 PRESS_i + \varepsilon_i \quad (1)$$

where $CORR_i$ is the corruption index of choice, DEC_i is our decentralisation indicator, $logGDP_i$ is the logarithm of GDP per capita (PPP), $logPOPUL_i$ is the

logarithm of total population and $PRESS_i$ is the degree of press freedom[11].

We test Model 1 using a dataset containing information for up to 177 countries. This data include standard decentralisation indicators used by others and some newly assembled measures. To measure corruption we use the World Bank's Control of Corruption Index[12]. The decentralisation measures, definitions and coverage are given in Table 1 below. Some of the indicators are alternative measures for a certain type of decentralisation. More details about the data source and methodological procedure are given in the Data Appendix. Table 2 presents summary statistics for some of our variables.

Table 1: **Decentralisation indicators**

Variable	Description	Type	Obs	Years
exp	Sub-national expenditure (% total exp.)	Market	69	1990-00**
rev	Sub-national revenue (% total revenue)	Market	68	1990-00**
fis	Score for fiscal decentralisation	Market	67	1996
$muni$	Local governments elected?	Political	127	2000
$state$	State/province governments elected?	Political	134	2000
$stconst$	Are senators' constituencies the provinces?	Political	58	2000
$author$	Sub-national authority in fiscal and legal	Political	61	2000
$auton$	Existence of autonomous regions	Political	156	2000
pol	Score for political decentralisation	Political	67	1996
$dec2$	Political decentralisation index (1)	Political	75	2000
$dec4$	Political decentralisation index (2)	Political	80	2000
$federal$	Federalism dummy	Constitutional	177	2000
$federal(2)$	Federalism dummy (broad concept)	Constitutional	177	2000
$fedindex$	Index of federalism	Constitutional	125	2000
$unitary$	Index of unitarism	Constitutional	106	2000
$unitaryhis$	Index of unitary history	Constitutional	106	2000
$tiers$	Number of elected sub-national tiers	Spatial	127	1999
$regj$	Number of intermediate jurisdictions	Spatial	61	1999
$locj$	Number of local jurisdictions	Spatial	108	1999

* This is the number of countries with data available for each indicator (using the WBC corruption index).
** Average for the period. For sources see Data Appendix

In line with our discussion in the previous section, we group these measures into four groups: market, constitutional, political and spatial decentralisation. In many

---

[11]This is essentially a proxy for democratic conditions in a country. The inclusion of this variable here is supported by the empirical evidence confirming its robustness as a determinant of corruption [Brunetti and Weder (2003), Chowdhury (2004), and Freille et al. (ming)] and the high correlation between press freedom and all the democracy indicators.

[12]This choice is made to maximise the set of available observations. We have tested the robustness of this choice to the alternative measures of corruption by Transparency International's CPI and the International Country Risk Guide (ICRG) and for a common set of countries find no substantive differences. These results are available from the authors on request.

cases we can capture different aspects of these four main types of decentralisation. We detail the data sources for these variables in the Appendix, along with some summary statistics and the correlation between the variables.

Fiscal Decentralisation. The most commonly used indicator of fiscal decentralisation in the literature is the percentage ratio of sub-national government expenditure to total government expenditure. We also consider the sub-national government revenue since it is also a reasonable measure[13]. In both cases the data are an average for the 1990-2000 period.

Constitutional Decentralisation. Constitutional decentralisation refers to whether the structure of the relations between different government units are based on federal or unitary grounds according to legal bodies. In general, researchers capture this as a zero-one dummy with all countries not explicitly federal being considered as unitarian. In our study we explore several alternatives to this. Our main control for the federal structure of a country -*unitaryhis*-, however, is a newly assembled indicator that measures not only the current status of federal or unitary but also takes into account history into consideration. In particular, this variable gives the score of unitary history for a country during a period of 100 years. In other words, if a country has always been a federation or federal (Argentina, Canada, Malaysia and Switzerland among others), then the score assigned is 0. Countries that have been mostly unitary throughout this time period (like Denmark, Japan, and Sweden), receive high scores, whereas countries that have changed either changed regime or have a relatively short unitary history are ranked in between (Austria, Spain and Thailand).

Political Decentralisation. According to the World Bank, political decentralisation is about providing the citizens of a country more power in public decision-making and is associated with institutions ranging from pluralistic politics and representative government, to local and regional democratization and greater participation in decisions. We have a number of political decentralisation indicators taken from different sources. We consider three of these to most fully capture

[13]One problem of using these two indicators as alternative is the existence of vertical fiscal imbalances. In short, this implies that sub-national revenues fall short of sub-national expenditure and the difference should be compensated by coordination mechanisms between the different levels of government. If the vertical imbalance is relatively high, it is better to use the expenditure indicator since it captures more adequately the degree of public service decentralisation.

Table 2: **Summary statistics for selected variables**

Variable	Description	Mean	Std. Dev.	Min.	Max.	N
exp	Share of sub-national gov. exp.	22.9	15.6	2.02	80.53	69
rev	Share of sub-national gov. revenue	18.03	14.8	0.81	78.12	68
author	Sub-national authority in spend/tax	0.44	0.5	0	1	61
federal_alt	Dummy for federalism [Treisman]	0.1	0.3	0	1	177
tiers	Number of elected sub-national tiers	1.16	0.89	0	3	127
regj	Number of intermediate jurisdictions	26.74	24.9	2	135	61
locj	Number of local jurisdictions	4438.56	23949.3	17	237687	108
muni	Local governments elected?	1.36	0.82	0	2	127
state	State/prov. governments elected?	0.87	0.81	0	2	134
fis	Score for fiscal decentralisation	0.41	0.22	0	1	67
pol	Score for political decentralisation	0.55	0.23	0	1	67
adm	Score for adm. decentralisation	0.54	0.28	0.01	1	67
auton	Existence of autonomous regions?	0.1	0.3	0	1	156
stconst	Are senators' constituencies the provinces?	0.5	0.5	0	1	58
dec2	Political decentralisation index 1	2.21	1.6	0	5	75
dec4	Political decentralisation index 2	2.2	1.53	0	4	80
federal	Dummy for federal countries	0.13	0.34	0	1	177
fedindex	Index of federalism	4.14	1.32	1	5	125
unitary	Index of unitarism	1.6	0.74	0	2	106
unitaryhis	Index of unitary history	36.82	31	0	101	106
federal(2)	Federal dummy (broad)	0.28	0.45	0	1	174
cpi	Corruption Perception Index (TI)	4.73	2.4	1.2	10	91
icrg	Corruption Index (ICRG)	2.96	1.22	1	6	140
wbc	Corruption Index (World Bank)	-0.02	1.03	-1.8	2.5	173
loggdp	Log of GDP per capita	3.68	0.51	2.67	4.77	160
logpopul	Log of total population	6.86	0.76	5.01	9.1	174
pss	Press freedom index	48.17	25.04	5	100	174
democindex	Index of democracy	5.93	7.99	0	66	153
demochis	Dummy for democratic history	0.26	0.44	0	1	107
polrights	Index of political rights	3.59	2.23	1	7	174
democ1	Alternative democracy index	3.65	1.98	1	7	174
bri	Dummy for former British colony	0.28	0.45	0	1	177
fre	Dummy for former French colony	0.16	0.37	0	1	177
spa	Dummy for former Spanish colony	0.11	0.32	0	1	177
por	Dummy for former Port. colony	0.03	0.17	0	1	177
ethno	Ethno-linguistic frac. index	0.35	0.3	0	1	143
eng	English legal system (dummy)	0.31	0.46	0	1	175
soc	Socialist legal system (dummy)	0.19	0.4	0	1	175
fre	French legal system (dummy)	0.43	0.5	0	1	175
ger	German legal system (dummy)	0.03	0.18	0	1	175
sca	Scandinavian legal system (dummy)	0.03	0.17	0	1	175
pro_d	Dummy for Protestant country	0.22	0.41	0	1	174

Note: Only selected variables are given in the Table. Data for year 2000, otherwise the closest available year. For sources and data description see table 11 in Appendix **??**

the essence of political decentralisation: *muni*, a categorical variable indicating the existence of municipal executive and legislative elections, *state*, a similar variable for provincial or state elections and *stconst*, a dummy registering whether the provinces/states represent the constituencies of the senators. Although we consider all three indicators in our regressions, we believe the variables measuring the existence of municipal elections, *muni*, best captures the idea of political decentralisation.

Spatial Decentralisation. Finally, spatial decentralisation concerns the vertical (number of tiers) and horizontal (number of jurisdictions within each tier) make-up of the political structure[14]. We use three indicators: the number of elected tiers (*tiers*), the number of elected regions or jurisdictions within the upper tier (*regj*) and the number of elected localities or jurisdictions within the lower tier (*locj*).

Table 8 in the Appendix shows the correlations between different forms of decentralisation, while we reproduce the correlation from the main decentralisation variables in Table 3. It appears from both that the interrelations between constitutional, political and structural decentralisation are straightforward. Of the correlations that are found some are intuitive; the positive correlation between *federal* and *unitaryhis*; that countries with a federal system are also likely to have local (*muni*) and regional (*state*) elections and have higher number of elected government tiers (*tiers*), for example. Other significant correlations are harder to explain as is the case with the correlation between *unitaryhis* and *stconst*.

Figure 1 provides a different way to look at the data. Here we arrange countries according to their fiscal and constitutional decentralisation regimes and indicate the level of corruption in those countries. According to the previous literature, we would expect countries with a high level of market decentralisation and with constitutional centralisation (*unitarism*) to show low corruption levels. This is observerd in the figure by looking at the upper right-hand side quadrant where all countries (in bold) have low corruption levels. Similarly, countries with low levels of market decentralisation and with constitutional decentralisation (*federalism*) should have high corruption levels. Although the evidence is not as strong as

---

[14]Treisman (2002b) introduces his definition of vertical decentralisation by measuring the number of tiers in a system. This categorization includes single-tiered systems such as Singapore and multi-tiered systems such as Argentina, the United States and China.

Table 3: **Pairwise correlations between selected decentralisation indicators**

VARIABLES	unitaryhis	muni	locj	federal	state	stconst	tiers	regj
unitaryhis	1.000							
	(106)							
muni	0.137	1.000						
	(85)	(127)						
locj	-0.141	0.108	1.000					
	(78)	(90)	(216)					
federal	-0.330*	0.209*	0.275*	1.000				
	(106)	(127)	(216)	(177)				
state	0.045	0.547*	0.066	0.361*	1.000			
	(84)	(110)	(96)	(134)	(134)			
stconst	-0.318*	0.314*	0.201	0.447*	0.288*	1.000		
	(48)	(45)	(41)	(58)	(49)	(58)		
tiers	0.140	0.479*	0.190*	0.437*	0.359*	0.463*	1.000	
	(81)	(104)	(108)	(127)	(107)	(42)	(127)	
regj	0.085	0.112	-0.003	-0.138	0.004	-0.150	0.005	1.000
	(47)	(55)	(60)	(61)	(53)	(31)	(61)	(61)

Notes: The number of observations is given under the corresponding correlation. * Denotes significance at the 10% level

in the previous case, the lower left-hand side quadrant shows most countries as having intermediate to high corruption levels.

4 Fiscal decentralisation, federalism and political institutions

4.1 Which aspects of decentralization matter?

Tables 4 and 5 contain the results for the baseline regression specified above. We have considered the robustness of the results to alternative measures of corruption (the CPI and ICRG indices of corruption) and to changes in the number of observations. We also reproduce the latter in Table 9 in the Appendix **??** where we use a common subset of countries including all the countries with data available for all three corruption indexes.

		FISCAL DECENTRALIZATION			
		Low Fiscal Decentralization		High Fiscal Decentralization	
CONSTITUTIONAL DECENTRALIZATION	Unitarism	**Belgium** **Botswana** **Chile** **Costa Rica** Dom. Republic **Fiji** **France** **Israel**	**Italy** **Mauritius** **New Zealand** Panama **Portugal** Thailand Trinidad & Tobago **UK** Uruguay	**Austria** **Denmark** **Finland** **Iceland** **Ireland**	**Netherlands** **Norway** **South Africa** **Sweden**
	Federalism	*Albania* Bulgaria Croatia Czech Republic **Hungary** *Indonesia* Malaysia	*Nicaragua* *Paraguay* Poland *Romania* Slovakia **Slovenia**	**Australia** *Bolivia* Brazil **Canada** **Estonia** **Germany** *India* *Latvia*	Lithuania Mexico *Moldova* *Mongolia* **Spain** **Switzerland** **USA**

Notes: We consider the mean of the variables as a criterion to subdivide the sample
Countries in **BOLD** have *low corruption levels* (between 0.5 and 2.5)
Countries in NORMAL have *intermediate corruption levels* (between -0.5 and 0.5)
Countries in *ITALICS* have *high corruption levels* (between -2.5 and -0.5)

Figure 1: **Fiscal and constitutional decentralisation**

In discussing the results we begin with the *market decentralisation* indicators, the sub-national government expenditure as a percentage of total government expenditure and sub-national government revenue as a percentage of total government revenue. The results for these variables are consistent with earlier research: fiscal decentralisation is associated with lower corruption ratings [Huther and Shah (1998); Fisman and Gatti (2002); Barenstein and de Mello (2001)]. The coefficients are also similar in size to those obtained previously.

In contrast to the results for market decentralisation less agreement has been found in the literature for *constitutional decentralisation*. Treisman (2000) found that federal states are perceived to be more corrupt and that this conclusion was robust to several tests, whereas for a different indicator Gerring et al. (2005) find that unitary systems are strongly associated to good governance. Other have found no relationship between federalism and corruption [Fisman and Gatti (2002); Wu (2005)].

Table 5 confirms these mixed results. The zero-one federal dummy suggests that federalism has no relationship with corruption, a result similar to that obtained if

we use the federal dummy included in Treisman (2000)[15]. Investigating the results further, we find that we are unable to replicate Treisman's result that federal states are more corrupt for two reasons. Firstly, the effect of the federalism dummy is sensitive to the inclusion of the logarithm of total population and to cultural and historical indicators. Second, the results for the federalism dummy are sensitive to the year of choice. Specifying the model and the data as closely as possible to Treisman, our results are similar to his paper for 1996 and 1998 (federal states are more corrupt) although the coefficients are never significant, but the coefficients become negative when we use either 2000 or 2002 (federal states are less corrupt).

Also in Table 4 we explore whether using more detailed measures of constitutional decentralisation help to improve the robustness of this variable. The first measure is an index of federalism (fedindex) ranging from 1 (most federal) to 5 (most unitary). Although the positive sign of the coefficient implies that unitary countries are associated to lower corruption levels, it is not significantly different from zero. The second measure is taken from Gerring et al. (2005). The authors study the relative merits of federal and unitary systems and come to the conclusion that long-standing unitary systems are associated with lower corruption. The unitarism index (unitary) takes values of 0=federal (elective regional legislatures plus constitutional recognition of sub-national authority), 1=semi-federal (where there are elective legislatures at the regional level enjoying important policymaking power but in which constitutional sovereignty is reserved to the national government), and 2=unitary [Gerring et al. (2005)]. As it can be observed from Table 5, the coefficient on this variable is again not significant.

Our final indicator, also from Gerring et al. (2005), is an index of unitary history (*unitaryhis*) created on the basis of the annual unitary scores used to construct the dummy *unitary*[16]. The estimation results (regression corresponding to *unitaryhis* in Table 4) show that countries with long standing unitary regimes perform better

---

[15]Our federal dummy includes a slightly larger number of countries and therefore the number of federal states differ between our study and Treisman's. He uses the classification of federal countries as given in Elazar (1995), while we use this and other sources to update the data. As a result of this, we add Bosnia and Herzegovina, Comoros, Ethiopia, Serbia and Montenegro, South Africa, and the United Arab Emirates to the list of federal countries.

[16]Although the authors have used time series data we estimate the model using the index for the year 2000. We do this since there is little year-to-year variation in the index and we were unable to obtain the original data. The variable measures the unitary history of a country from 1901 to 2000. For construction, measurement and coverage of this index see Gerring et al. (2005).

in terms of corruption. Using our simple baseline regression, we have obtained the same qualitative results as Gerring et al. (2005), although it should be noted that they use the ICRG index of corruption instead. For the same index of corruption we find an insignificant effect from the unitary history variable (it is significant if we use the CPI index of corruption)[17].

In other models in Tables 4 and 5, we explore the relationship between political dimensions of decentralisation and corruption. Several forms of *political decentralisation* have been recognized in the literature including electoral decentralisation, structure of the party system, decision-making authority and residual powers [Treisman (2002b,a); Enikolopov and Zhuravskaya (2007)]. We focus, however, on a subset of these aspects for which we can find reliable data, namely indicators of electoral and authority decentralisation (also known as decision-making decentralisation).

It can be seen from Table 4 that none of the indicators of political decentralisation are significantly and consistently correlated to perceived corruption. Table 5 in Appendix suggests that this results is not robust for all measures of corruption however. According to the regression, the variable *author* the greater the authority over spending, taxing and legislation that is granted to sub-national governments, the more likely corrupt behaviour will arise when we measure corruption using the ICRG index. While the existence of municipal/local elections at executive and legislative level -*muni*- is negatively associated with the CPI measure of corruption, along with an aggregate indicator of political decentralisation, *dec4*, which aggregates over *muni* and *state*. The sensitivity of the political decentralisation measures as determinants of corruption matches results found elsewhere in the literature [Treisman (2002b,a)]. Enikolopov and Zhuravskaya (2007) find no direct relation of these indicators to corruption (only through their interaction with fiscal decentralisation measures)[18].

Finally in Table 4 we direct our attention to the *spatial decentralisation* indicators. The existence of autonomous contiguous regions, the number of regional jurisdictions and the number of local jurisdictions are included here along with the number

---

[17]Some investigation suggests that this difference is due to the use of panel data in their study.

[18]The severe limitations of the data, in its majority dummies or categorical variables suggest a careful interpretation of these findings. In any case, the available indicators do not seem to be affecting or affected by corruption in a direct way.

Table 4: **Baseline regressions - Cross Section (Year:2000) - Variable subset of countries**

Dependent variable: Corruption - Method: OLS

	EXP			REV			MUNI			STATE			AUTHOR			AUTON		
	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc
DEC	0.03** [2.40]	0.02** [2.46]	0.01*** [2.90]	0.03** [2.13]	0.02* [1.81]	0.01** [2.37]	-0.76*** [-3.15]	-0.04 [0.27]	-0.16** [-2.10]	-0.14 [-0.64]	-0.08 [-0.70]	0.00 [0.07]	-0.40 [-0.71]	-0.69*** [-3.20]	-0.11 [-0.70]	-0.47 [-0.96]	-0.36 [-1.31]	-0.22 [-1.24]
GDP	3.79*** [6.71]	0.96*** [2.98]	1.82*** [11.24]	3.99*** [6.81]	0.93*** [2.81]	1.87*** [10.92]	3.89*** [8.31]	0.87*** [3.48]	1.31*** [6.64]	3.39*** [6.69]	0.88*** [3.95]	1.45*** [11.23]	3.50*** [4.7]	0.88** [2.44]	1.21*** [4.46]	2.93*** [6.27]	0.90*** [4.67]	1.26*** [8.38]
POPUL	-0.57*** [-2.6]	-0.46*** [-3.34]	-0.23*** [-2.76]	-0.44** [-2.06]	-0.44*** [-3.27]	-0.18** [-2.15]	-0.35* [-1.67]	-0.09 [-0.67]	0.09 [1.06]	-0.53** [-2.51]	-0.15 [-1.16]	-0.07 [-1.15]	-0.30 [-0.97]	0.06 [0.32]	0.13 [1.25]	0.57*** [-2.89]	-0.14 [-1.17]	0.00 [-0.02]
PRESS	-0.02** [-2.37]	-0.03*** [-4.34]	-0.01*** [-3.61]	-0.02** [-2.33]	-0.03*** [-4.46]	-0.01*** [-3.62]	-0.02** [-2.46]	-0.02*** [-4.51]	-0.02*** [-3.87]	-0.02* [-1.84]	-0.02*** [-5.12]	-0.01*** [-3.54]	-0.02 [-1.17]	-0.28*** [-4.9]	-0.02*** [-2.36]	-0.02** [-2.08]	-0.02*** [-4.76]	-0.01*** [-3.78]
Obs	56	64	68	55	63	67	73	99	121	77	107	127	37	47	57	81	115	142
R²	0.76	0.61	0.83	0.76	0.59	0.83	0.74	0.48	0.69	0.72	0.47	0.73	0.69	0.50	0.65	0.71	0.49	0.69

	DECENT4			FEDINDEX			UNITARYHIS			TIERS			REGJ			LOCJ		
	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc
DEC	-0.30* [-1.94]	-0.05 [-0.64]	-0.05 [-1.13]	0.05 [0.42]	0.11 [1.56]	0.07 [1.42]	0.01** [2.17]	0.00 [0.86]	0.01** [2.44]	-0.12 [-0.6]	-0.21* [-1.72]	-0.04 [-0.48]	0.00 [0.3]	0.00 [-0.45]	0.00 [-0.22]	0.00 [0.87]	0.00** [2.14]	0.00 [1.58]
GDP	3.82*** [7.58]	0.93*** [3.6]	1.48*** [9.18]	2.90*** [6.13]	0.94*** [4.36]	1.44*** [9.32]	2.00*** [3.28]	0.92*** [3.33]	1.10*** [6.47]	2.62*** [6.61]	0.96*** [4.57]	1.22*** [9.94]	2.67*** [5.99]	1.13*** [4.37]	1.16*** [5.98]	2.77*** [7.19]	1.08*** [4.54]	1.31*** [10.15]
POPUL	-0.36 [-1.62]	-0.11 [-0.71]	-0.01 [-0.07]	-0.52* [-1.83]	-0.01 [-0.05]	0.01 [0.16]	-0.29 [-1.37]	-0.11 [-0.77]	0.03 [0.52]	-0.39* [-1.73]	-0.27* [-1.76]	-0.08 [-0.95]	-0.44 [-1.32]	-0.25 [-1.12]	-0.12 [-0.85]	-0.54* [-1.88]	-0.46** [-2.59]	-0.13 [-1.22]
PRESS	-0.02** [-2.01]	-0.02*** [-4.37]	-0.01*** [-3.18]	-0.02** [-2.23]	-0.02*** [-3.64]	-0.01*** [-2.94]	-0.05*** [-3.28]	-0.02*** [-2.59]	-0.02*** [-4.61]	-0.03*** [-3.48]	-0.03*** [-4.97]	-0.02*** [-5.49]	-0.04*** [-3.53]	-0.02*** [-3.25]	-0.02*** [-4.59]	-0.03*** [-3.26]	-0.02*** [-3.41]	-0.01*** [-4.94]
Obs	67	90	106	83	113	121	65	87	103	83	107	122	51	54	60	77	97	106
R²	0.72	0.46	0.71	0.69	0.47	0.71	0.70	0.48	0.73	0.69	0.56	0.74	0.74	0.57	0.76	0.69	0.54	0.75

White-corrected standard errors. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level. The constant term is not reported in this table. DEC is the decentralisation indicator which varies across the different columns of the table according to the measure selected. We estimate each alternative model for three different corruption indexes. Data are for 2000 except for TIERS, REGJ and LOCJ with data for 1999. GDP and POPUL are in logs.

Table 5: **Baseline regressions - Cross Section (Year= 2000) - Variable subset of countries - Additional Decentralisation Indicators**

DEPENDENT VARIABLE: CORRUPTION - METHOD: OLS

	FEDERAL			UNITARY			STCONST			FIS			POL			ADM		
	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc	cpi	icrg	wbc
DEC	0.16	-0.16	-0.03	-0.11	0.12	0.02	0.14	0.34	0.07	-0.43	0.47	0.08	0.37	0.84	0.49	-0.43	0.34	-0.11
	[0.39]	[-0.66]	[-0.16]	[-0.42]	[0.80]	[0.24]	[0.29]	[1.16]	[0.40]	[-0.36]	[0.96]	[0.20]	[0.28]	[1.65]	[1.26]	[-0.52]	[0.87]	[-0.35]
GDP	2.92***	0.89***	1.24***	2.30***	1.03**	1.25***	2.89***	0.50	1.37***	2.70***	0.82**	1.41***	2.67***	0.87**	1.42***	2.81***	0.79**	1.44***
	[6.33]	[4.64]	[8.58]	[4.05]	[3.66]	[8.25]	[3.25]	[1.13]	[6.21]	[3.18]	[2.53]	[4.73]	[3.11]	[2.66]	[5.01]	[3.27]	[2.55]	[5.32]
POPUL	-0.58**	-0.10	0.01	-0.49*	-0.07	0.02	-0.64**	-0.26	-0.08	-0.72*	-0.09	-0.06	-0.69*	-0.14	-0.07	-0.70*	-0.13	-0.05
	[-2.51]	[-0.72]	[0.12]	[-1.84]	[-0.37]	[0.25]	[-2.40]	[-1.30]	[-0.91]	[-1.81]	[-0.49]	[-0.50]	[-1.94]	[-0.65]	[-0.68]	[-2.01]	[-0.66]	[-0.45]
PRESS	-0.02**	-0.02***	-0.01***	-0.05***	-0.02**	-0.02***	-0.03**	-0.02**	-0.01***	-0.02	-0.02***	-0.01*	-0.02	-0.02***	-0.01*	-0.02	-0.02***	-0.01*
	[-2.13]	[-5.14]	[-4.14]	[-3.92]	[-2.73]	[-4.94]	[-2.29]	[-2.10]	[-2.84]	[-1.17]	[-3.07]	[-1.85]	[-1.16]	[-3.05]	[-1.97]	[-0.94]	[-3.36]	[-1.84]
Obs	88	126	157	65	87	103	39	48	55	37	43	55	37	43	55	37	43	55
R²	0.70	0.48	0.69	0.68	0.48	0.71	0.72	0.36	0.69	0.64	0.53	0.69	0.64	0.55	0.70	0.64	0.53	0.64

White-corrected standard errors. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level. The constant term is not reported in this table. DEC is the decentralisation indicator which varies across the different columns of the table according to the measure selected. We estimate each alternative model for three different corruption indexes. Data are for 2000 except for POL, FIS, and ADM with data for 1996. GDP and POPUL are in logs.

of elected sub-national tiers (vertical decentralisation according to Treisman). In no case is there any evidence of a relationship of any kind with corruption. This is consistent with Treisman (2002a) who found that the number of sub-national elected tiers is sensitive to the inclusion of a measure of GDP, one of the most robust determinants of corruption, and country size. The existence of autonomous contiguous regions may be in principle associated to lower corruption given that these regions may be seen as checks on the central authority. But the fact that most of these regions are associated to ethnic groups would probably act as a balancing act increasing corruption derived from ethnic or linguistic fragmentation. The data suggest that *auton* and corruption are not directly related.

From our discussion above, it is clear that there are relatively few measures of decentralisation that directly impact on corruption and even fewer that are robust across the different indices of corruption typically used in the literature. Some combinations of the significant variables uncovered are also somewhat puzzling. For example, how is that federal countries are more corrupt than unitary countries if market decentralisation is associated with lower corruption? Is the relationship between market decentralisation and corruption the same at different levels of market and political decentralisation? Why is political decentralisation not related to corruption in light of all the electoral accountability and local capture theories? To what extent is spatial decentralisation associated to more efficient organisation and delivery of public services? Does granting decision-making authority to sub-national governments have different impact on corruption if electoral decentralisation is in place?

4.2   Multi-dimensional corruption

One of our objectives in this work is to try to analyse a number of dimensions of decentralisation and their relationship with corruption. As we noticed earlier, the literature in this area is somewhat vague in describing the way in which different aspects of decentralisation may be simultaneously important. In Table 6 we concentrate on the main variables found to be significant in Table 4. Model 1 replicates the very basic model included in Table 4 with only the market decentralisation indicator (*rev*) controlled for. In model 5 we include both the market decentralisation and unitary history measures, in model 7 we add the political

decentralisation measure *muni* and in model 8 we add the spatial decentralisation control, *locj*. Only the results for market and constitutional decentralisation are robust; indeed their estimated effects increase in size and significance compared to the earlier regressions. These results do not change when we include the spatial and political decentralisation measures, excluding the market and constitutional decentralisation measures. This regression also highlights a limitation of trying to control for many dimensions of decentralisation, since the number of observations drops markedly. The main drop in the number of observations from model 5 to 12 is caused by the inclusion of *muni* for which we have many missing observations. We have also tested (although they are not shown in the table) the other indicators for constitutional (*federal*), political (*state*, *stconst*) and spatial (*tiers*, *regj*) decentralisation in the regressions as alternative indicators of *unitaryhis*, *muni* and *locj*. In no case are the coefficients significantly different from zero.

As a final check on these models, we have included additional controls in the specification. The idea behind this is to account for the possibility that there are direct and independent significant effects on corruption of variables not related to decentralisation. In general, when papers examine the relationship between federalism and corruption, they either exclude any other aspect of market decentralisation from the specification [Treisman (2000)] or they fail to find any significant direct effect of federalism on corruption [Fisman and Gatti (2002)]. Models 9 through 12 experiment using the specification given by model 7 (market, political and constitutional decentralisation altogether) and adding other standard controls that have been suggested as robust determinants of corruption elsewhere [Treisman (2000), La Porta et al. (1999) and Serra (2006)]. The extent of political rights, the ethno-linguistic fractionalization index, and dummies for British colonial history and protestantism as dominant religion come out insignificant without introducing any significant changes to the coefficients of our main variables of interest[19].

---

[19]We have also used alternative indicators for each of these controls and have also controlled for other potential determinants of corruption with the results being largely unchanged. Some of the results are included in the Appendix and all of them may be obtained from the authors.

Table 6: **Corruption on decentralisation and standard controls. Direct Effects**

DEPENDENT VARIABLE: CORRUPTION (WBC INDEX). METHOD: OLS

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12
rev	0.018***				0.029***	0.017***	0.030***	0.025***	0.030***	0.029***	0.029***	0.029***
	(4.195)				(7.795)	(3.603)	(7.337)	(4.908)	(7.025)	(5.998)	(7.006)	(6.135)
$loggdp$	1.954***	1.169***	1.329***	1.354***	1.883***	2.154***	1.983***	2.079***	1.983***	2.022***	1.967***	1.966***
	(12.652)	(7.157)	(6.736)	(10.828)	(11.073)	(12.064)	(11.468)	(10.860)	(10.947)	(9.274)	(11.990)	(10.917)
$logpopul$	-0.159**	0.049	0.095	-0.074	-0.121	-0.127	-0.103	-0.136	-0.103	-0.121	-0.101	-0.095
	(-2.022)	(0.741)	(1.178)	(-0.707)	(-1.541)	(-1.305)	(-1.157)	(-1.098)	(-1.145)	(-1.161)	(-1.206)	(-1.084)
pss	-0.010***	-0.017***	-0.015***	-0.013***	-0.004	-0.010***	-0.002	-0.005	-0.002	-0.005	-0.004	-0.003
	(-3.409)	(-4.475)	(-3.806)	(-4.737)	(-0.955)	(-2.733)	(-0.545)	(-1.079)	(-0.255)	(-0.956)	(-1.047)	(-0.608)
$unitaryhis$		0.005**			0.009***		0.009***	0.008***	0.009***	0.008***	0.009***	0.009***
		(2.110)			(5.310)		(4.727)	(4.033)	(4.663)	(3.616)	(4.657)	(4.183)
$muni$			-0.158**			-0.191	-0.109	-0.079	-0.109	-0.182	-0.133	-0.106
			(-2.022)			(-1.416)	(-0.681)	(-0.455)	(-0.666)	(-1.003)	(-0.852)	(-0.645)
$locj$				0.000				0.000				
				(1.120)				(1.532)				
$polrights$									-0.002			
									(-0.022)			
$ethno$										0.038		
										(0.147)		
bri											0.218	
											(1.579)	
pro_d												0.072
												(0.436)
$Adj\ R^2$	0.854	0.725	0.684	0.754	0.901	0.848	0.890	0.889	0.887	0.890	0.894	0.887
N	65	101	120	104	53	55	47	41	47	39	47	47

Note: All regressions exclude Argentina and Russian Federation. Robust standard errors (only t-ratios are reported). * Significant at the 10% level ** Significant at the 5% level *** Significant at the 1% level. All models are estimated by OLS. For details on data sources and description see appendix ??.

4.3   Interaction effects

Before we move on to consider the models with indirect and interaction effects we think it may be useful to examine the relationship between corruption and a few of the decentralisation indicators at different degrees of decentralisation. First, we split the sample according to certain criterion and perform a rolling regression. This procedure takes several steps involving ranking the observations on the variable of interest (market, political constitutional or spatial decentralisation in our case) and then running an initial regression for the observations satisfying the chosen criterion. For example, we may choose as our initial sub-sample the observations for which market decentralisation is less than the mean value. Another alternative is to choose an arbitrary sub-sample size and define that as the initial sub-sample. We then run a regression using this sub-sample, obtain the estimates and statistics and record the values. Next we add the nearest highest-ranked observation not included in the initial sub-sample and we drop the lowest-ranked observation included in the initial sub-sample. We always keep the sub-sample size constant throughout this analysis, thus making sure any changes are not due to the increase/decrease in sample size. We continue this procedure until the last (highest-ranked) observation is added and we record the estimates.

The only limitation to this procedure is that we can only perform it for the continuous measures of decentralisation, since using a discrete or categorical measure will result in all countries having the same rank within each category. Therefore we perform this analysis for three continuous measures of decentralisation: *exp*, *rev*, and *unitaryhis*. In the *exp* and *rev* cases we are left with 68 and 67 observations respectively and we choose a sub-sample size of 30 for each[20]. We use the World Bank Control of Corruption index which has been chosen as our main corruption index. We summarize the results of the analysis in the following graphs[21]. Graph 2 shows the sensitivity of the coefficient on market decentralisation as measured through sub-national expenditure (*exp*) to gradual shifts from lower to higher market decentralisation. It is clear from the graph that when our sub-sample includes the lower end of the scale (fiscally centralised countries) the

---

[20]Using the criterion of defining the sub-sample by the observations that fall below or above the average the size of the sub-samples is 24 in the *exp* case and 18 in the *rev* case.

[21]The same analysis has been performed for the selected decentralisation measures using alternative corruption indexes. Also, the coefficients, significance levels and all graphs may be obtained from the authors upon request.

coefficient of market decentralisation on corruption is negative (the dots in the figure) although almost never significant at the 10% level. But as we gradually include more fiscally decentralised countries in our sub-sample, the coefficients become positive and significant for a high percentage of regressions. The fact that the graph depicts a smooth transition from negative to positive coefficients when market decentralisation increases is indicative of the presence of heterogeneity in the relationship between these two variables[22].
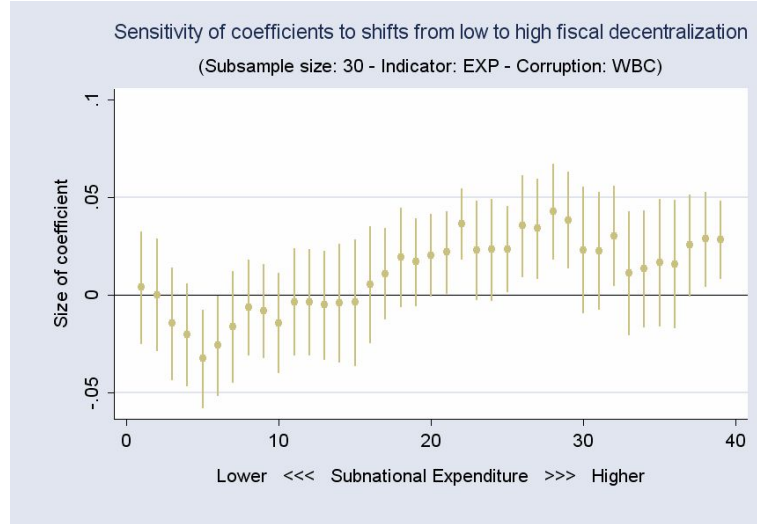

Figure 2: **Rolling regression for** *exp* **and** *wbc*

A similar pattern is observed in graph 3. The decentralisation measure is now the sub-national revenue share as a proportion of total government revenue (*rev*). The heterogeneity in the relationship between corruption and market decentralisation is present regardless of the market decentralisation indicator that we use. Graph 4 show the sensitivity of the coefficients of constitutional decentralisation (*unitaryhis*), the degree of unitary history of a country. It is worth noting the similarities between this graph and the previous ones. This variable does not measure the same aspects though since as we noted earlier unitary countries need not be more fiscally centralised than federal countries (although in practice this seems to be the case). In any case, this graph shows preliminary evidence suggesting that the relationship between long unitary history and corruption may not be as straightforward as it has been argued [Gerring et al. (2005)]. More importantly it appears that the relationship between long unitary history and less corruption

[22]However we should note that number of sub-samples which yield a significant coefficient is rather limited. It is likely that the drop in the number of observations in each sub-sample is responsible (at least partly) for the drop in significance levels.

is being driven by the sub-sample of historically unitarist countries which have a higher GDP per capita than the rest of the countries. In fact, the average GDP per capita for the sub-sample of historically unitarist countries is almost three times that of the historically federal countries[23].
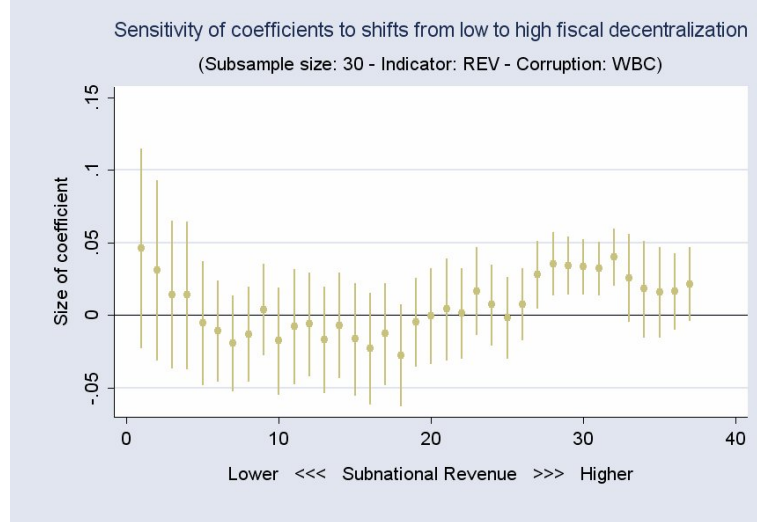

Figure 3: **Rolling regression for** *rev* **and** *wbc*

From the previous analysis it is evident that aspects of market and constitutional decentralisation are associated with corruption. It also appears that there may be some heterogeneity in the relationship between these variables and corruption. The results yielded by the rolling regression analysis suggest this may the case. Furthermore, we would like to examine the form of heterogeneity existent in this relationship and in order to do this we proceed with additional econometric analysis, this time adding interaction terms to the baseline specifications.

Now we want to examine the possibility that other aspects of decentralisation may affect corruption indirectly or that market and constitutional decentralisation may have an indirect rather than a direct effect on corruption. We use a base specification including both controls for market and constitutional decentralisation and we introduce some interactions terms. In principle, we would expect that other aspects of decentralisation or of the institutional environment may affect the impact of market or constitutional decentralisation on corruption. The interactions that we propose in this section are based in theoretical presumptions provided by the relevant literature. For instance, we interact the market decentralisation control

_____

[23]We split the sample into two grouping the countries above and below the average of unitary history.
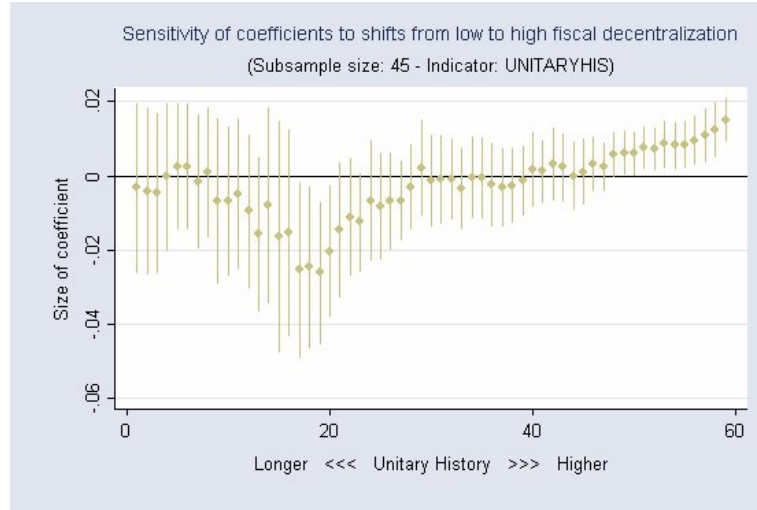
Figure 4: **Rolling regression for** *unitaryhis* **and** *wbc*

(*rev*) with both GDP per capita and with the political decentralisation indicators. It is expected that as nations become more developed the marginal effect of market decentralisation on corruption will be smaller since the increase in GDP per capita would improve corruption levels by a large extent. The interaction of market decentralisation with political decentralisation indicators arises naturally from Riker's theory and it was previously tested by Enikolopov and Zhuravskaya (2007). Other interactions that may be of interest are the constitutional decentralisation with ethnic and linguistic fragmentation: there is a long-standing line of research arguing that federal countries are better suited than unitary system to accommodate the effects of regional and ethnic differences [see Bermeo (2002) for a recent evaluation of these ideas.].

Looking at the results presented in Table 9, one thing that we notice is that the coefficients for both market (*rev*) and constitutional decentralisation (*unitaryhis*) keep the expected sign and their significance in most cases. As a first result, we can observe that the inclusion of interaction terms do not affect significantly the direct effects of the two decentralisation aspects.

Regarding the results for the interaction terms, only three models, 1, 5 and 7 yield significant coefficients. Model 1 produces a negative sign for interaction between constitutional decentralisation and market decentralisation. The negative sign implies that the positive effect of a unitary system on corruption is worsened when the country becomes more fiscally decentralised. As discussed earlier, unitary

26

Table 7: **Corruption on decentralisation and standard controls. Interaction Effects**

DEPENDENT VARIABLE: CORRUPTION (WBC INDEX). METHOD: OLS

	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8
rev	0.037***	0.064	0.031	0.028***	0.031***	0.030***	0.040***	0.038***
	(6.866)	(1.542)	(0.856)	(5.724)	(7.776)	(7.508)	(5.341)	(6.216)
$unitaryhis$	0.013***	0.009***	0.009***	0.009***	0.031***	0.018	0.008***	0.032***
	(4.251)	(5.095)	(4.692)	(4.367)	(3.184)	(0.666)	(3.586)	(3.262)
$loggdp$	1.876***	2.064***	1.984***	1.847***	1.872***	1.949***	2.011***	1.884***
	(11.292)	(7.580)	(10.607)	(8.698)	(9.459)	(7.339)	(8.005)	(9.848)
$logpopul$	-0.152*	-0.131*	-0.103	-0.136	-0.135	-0.117	-0.035	-0.170*
	(-1.945)	(-1.768)	(-1.146)	(-1.424)	(-1.605)	(-1.452)	(-0.267)	(-1.981)
pss	-0.003	-0.004	-0.002	-0.006	-0.005	-0.004	-0.007	-0.003
	(-0.613)	(-0.864)	(-0.530)	(-1.051)	(-1.005)	(-0.779)	(-1.208)	(-0.613)
$INT : rev \cdot unitary$	-0.000**							-0.000*
	(-2.113)							(-1.789)
$INT : rev \cdot gdp$		-0.008						
		(-0.837)						
$muni$			-0.107		0.456*			0.407
			(-0.430)		(1.732)			(1.499)
$INT : rev \cdot muni$			-0.000					
			(-0.015)					
$INT : unitary \cdot ethno$				-0.004				
				(-0.831)				
$INT : unitary \cdot muni$					-0.011**			-0.010*
					(-2.236)			(-1.857)
$INT : unitaryhis \cdot gdp$						-0.002		
						(-0.331)		
$regj$							0.007 **	
							(2.372)	
$INT : rev \cdot regj$							-0.001**	
							(-2.582)	
$Adj\ R^2$	0.905	0.900	0.887	0.903	0.898	0.899	0.900	0.901
N	53	53	47	45	47	53	30	47

Note: All regressions exclude Argentina and Russian Federation. Robust standard errors (only t-ratios are reported). * Significant at the 10% level ** Significant at the 5% level *** Significant at the 1% level. All models are estimated by OLS. For details on data sources and description see appendix ??.

27

systems need not be incompatible with other aspects of decentralisation. The sign of this interaction is somewhat surprising. One possible reason for this to happen is that when countries become more fiscally decentralized the effectiveness of a unitary structure to control and monitor the growing amount of resources allocated to the decentralised units decreases. In any event, even when the coefficient is negative and significant, its size is very small.

Model 5 yields a negative sign for the interaction term between political and constitutional decentralisation. Again, this means that the positive effect of constitutional decentralisation on corruption worsens when the country becomes more politically decentralised. Finally, the results for model 7 imply that the positive effect of market decentralisation on corruption is worsened when the number of intermediate jurisdictions grows. We have also tried other indicators of political decentralisation interacted with market and constitutional decentralisation measures but none of these other interaction terms was found significantly different from zero.

In model 8 we include both direct effects of fiscal and constitutional decentralisation and the interaction terms from models 1 and 5. The rationale for this is to test whether these interactions still hold when included within the same econometric model. Model 8 is clear in that it renders both direct effects and both interaction terms significant. The signs are the same as those obtained in the previous models. In this way, Model 8 stands both as a robustness check on the model with direct effects and also as a more comprehensive model for describing the empirical relationship between corruption and decentralisation. As it is clear from this model, our suggestions earlier in this research have been upheld by the analysis of the data.

5   Conclusions

The last 30 years have seen a large number of countries embark in some form of decentralisation. While the causes of this trend are in general precise and well-known, its consequences are much less certain and by no means definitive. Evaluating the results of decentralisation is not an easy task. Case studies provide

an important source of evidence but generalisation is not straightforward. Cross-country and panel-data studies are becoming more common but suffer from two main problems. On one hand, there are data issues. On the other hand, there are modelling problems. These two elements act as limiting forces on both the quantity and quality of empirical research. Nevertheless, there seems to be a renewed scholarly commitment to take the empirics to new levels.

We need better and more thorough empirical studies. We argue that a first step towards this is to understand decentralisation as multidimensional phenomenon that has a large variety of effects. In this sense, we should ideally aim at identifying these dimensions and postulating the likely effects and the interrelationships between them. In this sense, the theoretical literature has provided with interesting insights that have been often left unexplored by the empirical literature until very recently. Our work in this paper has shown why this approach is important, what are the some of questions still unresolved in the empirical literature and how to attempt a sensible approach to tackling these issues.

Recent literature has acknowledged the presence of a number of aspects that make the study of the relationship between decentralisation and corruption less obvious. First, it has been recognized that different dimensions of decentralisation exist and that they have complex interrelations. Second, it has been argued that the extent and effects of decentralisation may depend on the existence and extent of other dimensions of decentralisation. Although these ideas are not new, they are becoming increasingly common in the empirical literature. Finally, it has also been suggested that different dimensions of decentralisation may co-evolve and their interactions over time might have a strong effect on corruption and the institutional quality.

Our results in this paper may provide a few insights regarding the policy debate on the effects of decentralisation. In particular, as we have seen, the positive effect of market decentralisation on corruption seems to be larger when countries have a deeply rooted unitarist history. While this result seems to be not so intuitive, it is plausible that deepening fiscal decentralisation without changing the constitutional basis or government organisation may indeed be associated to higher corruption. After all, delegating more money to local governments which may lack the autonomy to create taxes -as might the case in a strong unitary system-,

may encourage bad governance and corruption. Furthermore, a growing number of unitary countries are resorting to local democratization processes via local elections or referenda voting. Our results suggest that a move to higher political decentralisation may have associated higher corruption particularly if the country is has a unitarist tradition and low levels of market decentralisation. It should be noted, that according to our results, the existence of long-standing unitary system has both direct and indirect association with corruption. As these have opposite signs, the overall result is uncertain and essentially an empirical matter.

Finally, although we have shown that our results are consistent with a sensible specification, and robust to controlling for different variables and data, we are rather shy regarding the direction of the causation. The aim in this paper has been to analyse the effect that the several interrelationships between multiple dimensions of decentralisation have on corruption. There may be additional considerations if endogeneity of the regressors is a possibility. In conclusion, the issue of whether decentralisation leads to more or less corruption is still uncertain and much more empirical research is needed. But we believe that this future empirical research should be aimed at exploring the interrelations of different aspects or dimensions of decentralisation. The study of these aspects has been suggested and carried out by Barenstein and de Mello (2001), Rodden (2002), Treisman (2002b,a) and Enikolopov and Zhuravskaya (2007). Our study contributes to this literature by both reinforcing some of the earlier findings and obtaining some new evidence.

References

Ames, B. (1994). The reverse coattails effect: Local party organization in the 1989 brazilian presidential election. *American Political Science Review*.

Aranson, P. H. (1990). Federalism: The reasons for rules. *Cato Journal*, 10(1):17–38.

Bardhan, P. and Mookherjee, D. (2000). Capture and governance at local and national levels. *American Economic Review*, 90(2):135–139.

Barenstein, M. and de Mello, L. (2001). Fiscal decentralization and governance:

A cross-country analysis. IMF Working Papers 01/71, International Monetary Fund.

Bermeo, N. (2002). A new look at federalism: The import of institutions. *Journal of Democracy*, 13(2):96–110.

Brunetti, A. and Weder, B. (2003). A free press is bad news for corruption. *Journal of Public Economics*, 87:1801–1824.

Chowdhury, S. K. (2004). The effect of democracy and press freedom on corruption: an empirical test. *Economics Letters*, 85(1):93–101.

Ebel, R. D. and Yilmaz, S. (2002). On the measurement and impact of fiscal decentralization. Policy Research Working Paper Series 2809, The World Bank.

Elazar, D. (1995). From statism to federalism: A paradigm shift. *Publius*, 25(2):5–18.

Enikolopov, R. and Zhuravskaya, E. (2007). Decentralization and political institutions. *Journal of Public Economics*.

Fisman, R. and Gatti, R. (2002). Decentralization and corruption: evidence across countries. *Journal of Public Economics*, 83:325–345.

Fjelstad, O.-H. (2004). Decentralisation and corruption: A review. CMI Working Paper 10, Bergen: Chr. Michelsen Institute.

Freille, S., Haque, E., and Kneller, R. (forthcoming). A contribution to the empirics of press freedom and corruption. *European Journal of Political Economy*.

Gelineau, F. and Remmer, K. L. (2006). Political decentralization and electoral accountability: The argentine experience, 1983-2001. *British Journal of Political Science*.

Gerring, J., Moreno, C., and Thacker, S. C. (2005a). Are unitary systems better than federal systems? Unpublished manuscript.

Gerring, J., Moreno, C., and Thacker, S. C. (2005b). Centripetal democratic governance: A theory and global inquiry. *American Political Science Review*, 99(4):567–581.

Goldsmith, A. A. (1999). Slapping the grasping hand: Correlates of political corruptionin emerging markets. *American Journal of Economics and Sociology*, 58(3):866–883.

Huther, J. and Shah, A. (1998). Applying a simple measure of good governance to the debate on fiscal decentralization. Policy Research Working Paper Series 1894, The World Bank.

Kuncoro, A. (2004). Bribery in indonesia: Some evidence from micro-level data. *Bulletin of Indonesian Economic Studies*, 40(3):329–354.

La Porta, R., Lopez-de Silanes, F., Shleifer, A., and Vishny, R. (1999). The quality of government. *Journal of Law, Economics and Organization*, 15(1):222–79.

Oates, W. (2005). Toward a second-generation theory of fiscal federalism. *International Tax and Public Finance*, 12(4):349–373.

Oates, W. E. (1972). *Fiscal federalism.* New York: Harcourt Brace Jovanovich.

Persson, T., Tabellini, G., and Trebbi, F. (2003). Electoral rules and corruption. *Journal of the European Economic Association*, 1(4):958–989.

Riker, W. (1964). *Federalism: Origins, operation, significance.* Little, Brown and Co., Boston, MA.

Rodden, J. (2002). The dilemma of fiscal federalism: Grants and fiscal performance around the world. *American Journal of Political Science*, 46(3):670–687.

Rondinelli, D. A. (2006). *International Development Governance*, chapter Decentralization and development. CRC Press.

Samuels, D. (2000). The gubernatorial coattails effect: Federalism and congressional elections in brazil. *Journal of Politics*.

Schneider, A. (2003). Decentralization: Conceptualization and measurement. *Studies in Comparative International Development*, 38(3):32–56.

Serra, D. (2006). Empirical determinants of corruption: A sensitivity analysis. *Public Choice*, 126(1):225–256.

Tiebout, C. (1956). A pure theory of local expenditures. *Journal of Political Economy*, 64(5):416–424.

Treisman, D. (2000). The causes of corruption: A cross-national study. *Journal of Public Economics*, 76(3):399–457.

Treisman, D. (2002a). Decentralization and the quality of government. Unpublished manuscript.

Treisman, D. (2002b). Defining and measuring decentralization: A global perspective. Unpublished manuscript.

Wade, R. (1997). How infrastructure agencies motivate staff: Canal irrigation in india and the republic of korea. In Mody, A., editor, *Infrastructure Strategies in East Asia*. World Bank.

Wu, X. (2005). Corporate governance and corruption. *Governance: An International Journal of Policy*, 18(2):151–170.

6 Appendix

Table 8: **Pairwise correlations among selected decentralisation indicators**

	exp	rev	muni	sta	const	auth	auto	dec4	dec2	fed1	fed2	fedi	unit	uhis	fis	pol	adm	tier	regj	locj
exp	1.00																			
rev	0.95	1.00																		
muni	0.06	0.08	1.00																	
sta	0.41	0.38	0.55	1.00																
const	0.52	0.47	0.31	0.29	1.00															
auth	0.55	0.57	0.52	0.69	0.31	1.00														
auto	0.24	0.24	0.12	0.08	0.28	0.19	1.00													
dec4	0.53	0.48	0.89	0.89	0.26	0.71	0.26	1.00												
dec2	0.56	0.52	0.88	0.88	0.29	0.71	0.39	0.99	1.00											
fed1	0.47	0.44	0.21	0.36	0.48	0.67	0.07	0.31	0.32	1.00										
fed2	0.45	0.39	0.18	0.34	0.45	0.63	0.24	0.41	0.43	0.62	1.00									
fedi	-0.47	-0.47	-0.25	-0.32	-0.48	-0.61	0.00	-0.35	-0.35	-0.78	-0.62	1.00								
unit	-0.63	-0.65	-0.15	-0.41	-0.48	-0.61	-0.09	-0.30	-0.33	-0.88	-0.69	0.86	1.00							
uhis	-0.24	-0.32	0.14	0.04	-0.32	-0.19	-0.10	0.18	0.17	-0.33	-0.20	0.31	0.38	1.00						
fis	0.51	0.54	0.13	-0.01	0.08	0.39	0.04	0.22	0.20	0.17	0.03	-0.01	0.21	0.16	1.00					
pol	-0.03	0.15	-0.11	0.06	0.25	-0.23	0.03	-0.01	-0.01	-0.01	0.05	-0.13	-0.17	0.06	-0.04	1.00				
adm	-0.04	-0.06	0.13	-0.15	0.01	0.24	0.02	0.53	0.55	0.03	-0.04	0.17	0.42	0.36	0.04	0.04	1.00			
tier	0.22	0.13	0.48	0.36	0.50	0.40	0.05	0.42	0.42	0.44	0.35	-0.43	-0.42	0.14	-0.05	-0.16	-0.13	1.00		
regj	-0.05	-0.04	0.12	0.00	-0.14	-0.04	-0.04	0.04	0.03	-0.14	-0.01	0.00	0.06	0.08	0.45	-0.09	0.25	0.01	1.00	
locj	0.30	0.25	0.11	0.07	0.20	0.23	-0.03	0.22	0.23	0.27	0.20	-0.30	-0.28	-0.14	-0.10	-0.21	-0.12	0.19	0.00	1.00

Pairwise correlations are calculated for year 2000. * Denotes significance at the 5% level.

Table 9: **Baseline regressions - Cross Section (Year= 2000) - Common subset of countries**

DEPENDENT VARIABLE: CORRUPTION - METHOD: OLS

	EXP cpi	EXP icrg	EXP wbc	REV cpi	REV icrg	REV wbc	MUNI cpi	MUNI icrg	MUNI wbc	STATE cpi	STATE icrg	STATE wbc	AUTHOR cpi	AUTHOR icrg	AUTHOR wbc	AUTON cpi	AUTON icrg	AUTON wbc
DEC	0.03** [2.31]	0.02** [2.35]	0.01 [1.47]	0.03** [2.05]	0.02* [1.76]	0.01* [1.22]	-0.74*** [-3.01]	-0.16 [-1.4]	-0.35*** [-3.17]	-0.15 [-0.69]	-0.25** [-1.95]	-0.04 [-0.46]	-0.40 [-0.71]	-0.64*** [-2.58]	-0.30 [-1.21]	-0.44 [-0.91]	-0.28 [-1.21]	-0.07 [-0.28]
GDP	3.75*** [6.48]	0.83* [1.92]	1.83*** [7.4]	3.93*** [6.58]	0.87* [1.92]	1.90*** [7.55]	3.85*** [8.22]	1.23*** [4.86]	1.86*** [8.33]	3.40*** [6.64]	1.23*** [5.8]	1.64*** [6.78]	3.50*** [4.7]	1.24** [3.97]	1.70*** [4.69]	2.89*** [6.16]	0.97*** [4.78]	1.45*** [6.5]
POPUL	-0.59** [-2.67]	-0.54*** [-3.53]	-0.18* [-1.82]	-0.47** [-2.15]	-0.52*** [-3.42]	-0.13 [-1.37]	-0.39* [-1.82]	-0.43*** [-2.95]	-0.13 [-1.3]	-0.52** [-2.46]	-0.35** [-2.33]	-0.19* [-1.9]	-0.30 [-0.97]	-0.27 [-1.20]	-0.05 [-0.34]	-0.63*** [-3.15]	-0.50*** [-3.86]	-0.24** [-2.6]
PRESS	-0.02* [-2.39]	-0.03*** [-3.42]	-0.02*** [-3.25]	-0.02** [-2.35]	-0.03*** [-3.41]	-0.02*** [-3.23]	-0.02** [-2.51]	-0.02*** [-4.8]	-0.01*** [-3.03]	-0.02* [-1.9]	-0.02*** [-5.18]	-0.01** [-2.32]	-0.02 [-1.17]	-0.02*** [-3.82]	-0.02** [-1.61]	-0.02** [-2.18]	-0.02*** [-5.00]	-0.01** [-2.42]
Obs	55	55	55	54	54	54	71	71	71	76	76	76	37	37	37	79	79	79
R²	0.77	0.63	0.83	0.76	0.63	0.83	0.74	0.64	0.8	0.71	0.65	0.78	0.69	0.68	0.72	0.71	0.66	0.76

	DECENT4 cpi	DECENT4 icrg	DECENT4 wbc	FEDINDEX cpi	FEDINDEX icrg	FEDINDEX wbc	UNITARYHIS cpi	UNITARYHIS icrg	UNITARYHIS wbc	TIERS cpi	TIERS icrg	TIERS wbc	REGJ cpi	REGJ icrg	REGJ wbc	LOCJ cpi	LOCJ icrg	LOCJ wbc
DEC	-0.30* [-1.9]	-0.19** [-2.58]	-0.14** [-2.05]	0.04 [0.37]	0.06 [0.92]	0.04 [0.80]	0.01** [2.17]	0.00 [0.41]	0.00** [2.12]	-0.11 [-0.56]	-0.29** [-2.50]	-0.03 [-0.29]	0.00 [0.45]	0.00 [-0.19]	0.00 [-0.15]	0.00 [0.88]	0.00** [2.64]	0.00 [1.75]
GDP	3.83*** [7.5]	1.35*** [5.84]	1.89*** [7.43]	2.86*** [6.05]	0.98*** [4.65]	1.45*** [6.44]	1.95*** [3.17]	0.60* [1.98]	0.97*** [3.46]	2.61*** [6.54]	1.00*** [4.89]	1.31*** [6.93]	2.61*** [5.66]	0.99*** [3.6]	1.23*** [5.4]	2.76*** [7.09]	1.04*** [4.53]	1.37*** [7.41]
POPUL	-0.36 [-1.61]	-0.37** [-2.28]	-0.10 [-1.02]	-0.59*** [-2.08]	-0.40** [-2.35]	-0.16 [-1.33]	-0.35* [-1.72]	-0.41** [-2.52]	-0.13 [-1.42]	-0.39* [-1.72]	-0.33** [-2.01]	-0.11 [-1.07]	-0.42 [-1.26]	-0.30 [-1.24]	-0.06 [-0.47]	-0.54* [-1.88]	-0.55** [-2.92]	-0.19 [-1.6]
PRESS	-0.02** [-2.05]	-0.02*** [-4.97]	-0.01** [-2.59]	-0.03*** [-2.33]	-0.02*** [-4.68]	-0.01*** [-2.74]	-0.05*** [-3.33]	-0.04*** [-4.36]	-0.03*** [-4.21]	-0.03*** [-3.52]	-0.03*** [-5.35]	-0.02*** [-3.99]	-0.05*** [-3.8]	-0.03*** [-4.03]	-0.03*** [-4.4]	-0.03*** [-3.29]	-0.02*** [-4.1]	-0.02*** [-3.88]
Obs	66	66	66	82	82	82	64	64	64	82	82	82	50	50	50	76	76	76
R²	0.71	0.65	0.78	0.69	0.64	0.76	0.71	0.60	0.78	0.69	0.66	0.77	0.74	0.59	0.78	0.69	0.62	0.77

White-corrected standard errors. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level. The constant term is not reported in this table. DEC is the decentralisation indicator which varies across the different columns of the table according to the measure selected. We estimate each alternative model for three different corruption indexes. Data are for 2000 except for TIERS, REGJ and LOCJ with data for 1999. GDP and POPUL are in logs.

36

Table 10: Baseline regressions - Cross Section (Year= 2000) - Common subset of countries - Additional Decentralisation Indicators

Dependent variable: Corruption - Method: OLS

	FEDERAL			UNITARY		
	cpi	icrg	wbc	cpi	icrg	wbc
DEC	0.17 [0.40]	-0.01 [-0.04]	0.01 [0.26]	-0.12 [-0.47]	0.01 [0.09]	-0.03 [-0.29]
GDP	2.88*** [6.22]	0.98*** [4.68]	1.45*** [6.51]	2.25*** [3.92]	0.64** [2.03]	1.08*** [4.05]
POPUL	-0.63** [-2.68]	-0.46*** [-3.31]	-0.22** [-2.09]	-0.57** [-2.16]	-0.41** [-2.16]	-0.21* [-1.8]
PRESS	-0.02** [-2.23]	-0.02*** [-4.9]	-0.01*** [-2.66]	-0.05*** [-3.98]	-0.04*** [-4.54]	-0.03*** [-4.75]
Obs	86	86	86	64	64	64
R²	0.70	0.65	0.76	0.69	0.60	0.76

White-corrected standard errors. *** Significant at the 1% level. ** Significant at the 5% level. * Significant at the 10% level. The constant term is not reported in this table. DEC is the decentralisation indicator which varies across the different columns of the table according to the measure selected. We estimate each alternative model for three different corruption indexes. Data are for 2000 except for POL, FIS, and ADM with data for 1996. GDP and POPUL are in logs.

Table 11: **Variable description and data sources**

Code	Variable description	Detail and source
cpi	Corruption Perception Index	Elaborated by Transparency International. This measure provides (subjective) perceptions of bureaucratic corruption across countries. Scores range from 0 (most corrupt) to 10 (least corrupt). From 1995 to 2004. (Available from www.transparency.org)
wbc	Control of Corruption Index	One of the indicators of the Worldwide Governance Research Indicators Dataset 2004 available from the World Bank at `www.worldbank.org/wbi/governance/data.html#dataset`.
icrg	ICRG Corruption Ratings	Corruption ratings included in the International Country Risk Guide Database elaborated by Political Risk Services. Accessible at `www.icrgonline.com`.
logGDP	Logarithm of GDP per capita	The logarithm of real GDP per capita PPP was taken from the 2003 World Bank Indicators CD-Rom. From 1993 to 2001.
logPOPUL	Logarithm of Total Population	Years available 1969-2004. Data from the Worldbank's World Development Indicators (2006).
pss	Press Freedom Index	Index of Press Freedom. Ranges from 0 to 100 with low scores indicating more press freedom and high values denoting less press freedom. Released by Freedom House (www.freedomhouse.org).
exp	Subnational expenditure as % of total government expenditure	Average for the period 1990-2000 of the IMF's Government Finance Statistics. Available at `http://www.worldbank.org/publicsector/decentralisation/data.htm`
rev	Subnational revenue as % of total government revenue	Average for the period 1990-2000 of the IMF's Government Finance Statistics. Available at `http://www.worldbank.org/publicsector/decentralisation/data.htm`
muni	Are municipal governments locally elected?	Categorical variable taking the value of 2 if both the local executive and legislative are locally elected, 1 if the executive is appointed but the legislature elected and 0 if both are appointed. Available from the Database of Political Institutions 2004 (DPI).
state	Are state/province governments elected?	Categorical variable taking the value of 2 if both the state/provincial executive and legislative are elected, 1 if the executive is appointed but the legislature elected and 0 if both are appointed. Available from the Database of Political Institutions 2004 (DPI).
stconst	Are the constituencies of the senators the state/provinces?	Dummy variable taking value 1 if the Senate is elected on a state/province basis and 0 if otherwise. Taken from the Database of Political Institutions 2004 (DPI).
author	Do the state provinces have authority over taxing, spending or legislating?	Dummy variable taking the value of 1 if any of these is true, 0 otherwise. Available from the Database of Political Institutions 2004 (DPI).

	11 – Continued from previous page	
Code	**Variable description**	**Detail and source**
auton	Are there autonomous regions?	Dummy variable taking the value of 1 if there exists autonomous contiguous regions, 0 otherwise. Available from the Database of Political Institutions (DPI).
pol	Factor score for political decentralization	It ranges from 0 (low decentralization) to 1 (high decentralization). Source: **?**. Year of observations, 1996.
fis	Factor score for fiscal decentralization	It ranges from 0 (low decentralization) to 1 (high decentralization). Source: **?**. Year of observations, 1996.
adm	Factor score for administrative decentralization	It ranges from 0 (low decentralization) to 1 (high decentralization). Source: **?**. Year of observations, 1996.
dec2	Political decentralization index	Constructed on the basis of aggregating *auton*, *muni* and *state*, from the Database of Political Institutions (DPI).
dec4	Political decentralization index	Constructed on the basis of aggregating *muni* and *state*, from the Database of Political Institutions (DPI).
federal	Dummy for a federal country	Variable taking the value of 1 if the country is federal, 0 otherwise. Based on the classification of Elazar (1995) and the Handbook of Federal Countries. Other sources: CIA World Factbook, and selected Constitutions of countries.
federal(2)	Dummy for a federal country (broader concept)	Variable taking the value of 1 if the country is federal, 0 otherwise. Based on the classification of Elazar (1995) and the Handbook of Federal Countries. Other sources: CIA World Factbook, and selected Constitutions of countries.
federal_alt	Dummy for a federal country (Treisman)	Dummy for federalism. Source: Treisman (2000).
fedindex	Index of federalism	Ranges from 1 to 5, with lower values indicating a more federal country. Source: STM103 Global Indicators Shared Dataset V2.0 available at `www.pippanorris.com`.
unitary	Index of unitarism	Index taking the value of 0=federal (elective regional legislatures plus constitutional recognition of subnational authority) 1= semi-federal (where there are elective legislatures at the regional level enjoying important policy-making power but in which constitutional sovereignty is reserved to the national government) 2= unitary. Source: Gerring et al. (2005); **?** available at `www.pippanorris.com`. Year=2000.
unitaryhis	Index of Unitary History	Cumulative index constructed on the basis of the annual values of *unitary*. Source: Gerring et al. (2005); **?** available at `www.pippanorris.com`. Year=2000.
tiers	Number of elected sub-national tiers	Data for year 1999. Source: `www.worldbank.org`.
regj	Number of intermediate jurisdictions	Data for year 1999. Source: `www.worldbank.org`.
locj	Number of local jurisdictions	Data for year 1999. Source: `www.worldbank.org`.
polrights	Index of political rights	Political Rights Index (Freedom House). From 1 (most free) to 7 (least free). Source: `www.freedomhouse.org`.
	Continued on next page	

Code	Variable description	Detail and source
		11 – Continued from previous page
ethno	Ethnolinguistic fractionalisation index	Average value of 5 different indexes of ethnolinguistic fractionalization. Its value ranges from 0 to 1. Source: La Porta et al. (1999).
bri	Dummy for former British colony	Variable taking the value of 1 if the country has ever been a British colony, 0 otherwise. Source: Treisman (2000), **?** and CIA World Factbook.
fre	Dummy for former French colony	Variable taking the value of 1 if the country has ever been a French colony, 0 otherwise. Source: Treisman (2000), **?** and CIA World Factbook.
spa	Dummy for former Spanish colony	Variable taking the value of 1 if the country has ever been a Spanish colony, 0 otherwise. Source: Treisman (2000), **?** and CIA World Factbook.
por	Dummy for former Portuguese colony	Variable taking the value of 1 if the country has ever been a Portuguese colony, 0 otherwise. Source: Treisman (2000), **?** and CIA World Factbook.
pro_d	Dummy for Protestantism as dominant religion	Dummy taking the value of 1 if the country's dominant religion is Protestantism. Source: CIA World Factbook.
eng	English legal origin	Dummy taking the value of 1 if the country has a tradition of English Common Law, 0 otherwise. Source: La Porta et al. (1999)
soc	Socialist legal origin	Dummy taking the value of 1 if the country has a tradition of Socialist/Communist Laws, 0 otherwise. Source: La Porta et al. (1999)
fre	French legal origin	Dummy taking the value of 1 if the country has a tradition of French Commercial Code, 0 otherwise. Source: La Porta et al. (1999)
ger	German legal origin	Dummy taking the value of 1 if the country has a tradition of German Commercial Code, 0 otherwise. Source: La Porta et al. (1999)
sca	Scandinavian legal origin	Dummy taking the value of 1 if the country has a tradition of Scandinavian Commercial Code, 0 otherwise. Source: La Porta et al. (1999)