Machine Politics and Informality: Evidence on Electoral Volatility, Institutional Quality and the Shadow Economy*

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Abstract

Is there a causal link between corrupt machine politics and informality? This paper is the second stage in tackling this question whereby data from 64 democracies is explored through an instrumental variable approach. The hypothesis is that machine politics shapes institutional quality in democracies and thereby determines informality. The conceptual framework is based on the *political exchange space* and the portfolio theory of electoral investment. Machine politics is proxied by electoral risk, and institutional quality is measured by the index of the rule of law. Instruments of machine politics are searched for among *de-jure* political institutions. However, these rules reach significance only when they interact with instruments from *de-facto* institutions. In this way, ethnic fractionalization, proportional rule and a small-district magnitude bring about centrifugal forces in the party system, which negatively affect the rule of law, whereas the age of the democracy and parliamentary regimes through their centripetal effect enhance institutional quality. The policy implication suggests that pro-development institutional design must tackle the interactions between *de-jure* and *de-facto* institutions that are responsible for the stability of the effective number of parties.

Key Words: Machine Politics, Clientelism, Informality, Shadow Economy, Electoral Volatility, Institution Building.

JEL Classification: D72, O17, P16.

1 Introduction

Is there a causal link between machine politics and informality? The first paper investigates this question by studying the relationship between electoral redistributive politics and economic duality. The model illustrates how electoral politics determines the size of the modern sector via taxation which causes output reallocation between sectors. Likewise, the first paper showed that a shrinking modern sector or an expanding traditional sector does not necessarily imply a decline in total output.

However, the theoretical discussion of the first paper is static in nature and the institutional quality is exogenous, i.e. politician's commitment is taken for granted, there is no rent-extraction and provision of public goods is fixed. Thus, targeted redistribution is constrained and takes the form of subsidies or differentiated tax rates. Also, conflict among

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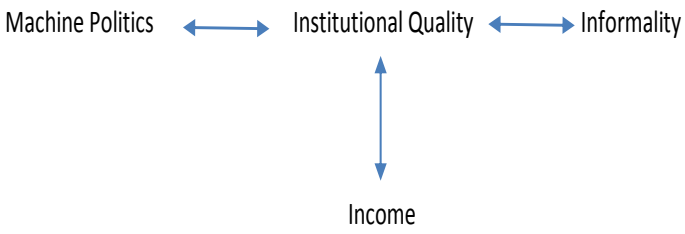
voters is simplified as income division has preeminence in voters' identity. In this way the distributional conflict among voters, and among voters and politicians is oversimplified. For example, in more fragmented societies where other divisions do not straightforwardly match income levels, strategic interaction among political cleavages is more complex than the one considered in the model. Although these assumptions serve analytical purposes like tractability, understanding how such conflicts are solved as well as their consequences over political and economic performance is a central task for development economics.

Drawing upon insights discussed in the first paper, this second paper introduces an empirical approach to explore the link between machine politics and informality. Here institutions are endogenous for they both determine and are influenced by economic and political outcomes. The basic relationship to examine is illustrated in Diagram 1:

Diagram 1. Conceptual Relationships



Recall that machine politics and targeted redistribution are interchangeable terms in this research. In Diagram 1, machine politics and the institutional quality have a two-way relationship so that machine politics affects income indirectly via the institutional quality. The relationship between income and the institutional quality is also two-way where income determines informality directly (via the business cycle) and indirectly (structurally via institutions). A central premise is that the locus of political power and *de-jure* institution building in a democracy lies in political parties (Scott, 1972). Thus, rules shaping political agency have room to modify institutional quality.

Institutional quality denotes the broader set of rules, *de-facto* and *de-jure*, in which a society is embedded. Thus, a market economy has good or strong institutions when these rules encourage investment and accumulation in physical and human capital, as well as the development and adoption of better technologies (Acemoglu, 2009). Likewise, a democratic polity has strong institutions when democracy is consolidated, i.e. political freedom and civil rights are guaranteed and political accountability operates (Kaufmann et al., 2010).

Persson & Tabellini's (2003) stylized view of the democratic policymaking process is helpful in understanding how an economic outcome such as informality can be determined by a political outcome such as machine politics. In this view, *de-jure* political rules (constitutional and electoral), shaped by society's policy preferences, bring about political outcomes (e.g. party system) which are decisive for policy decisions (e.g. taxes, investment in public goods). These policy choices regulate the market which, according to its characteristics and structure, produces economic outcomes (i.e. total factor productivity). Since economic outcomes provide feedback to policy preferences, this process is one of circular causation

conveying that economic and political systems are jointly determined as North et al. (2009) sustain from a historical perspective.[1]

To explore these statements empirically, I adopt an Instrumental Variables (IV) approach which allows me to reason about a sequence of causation and deal with endogenity. Democracies in the sample, 64 in total, held free and fair chamber elections at least three consecutive periods and have a Polity 2 score of 0 or higher.[2] Machine politics is proxied by electoral volatility (EV) and institutional quality is measured by the index of the rule of law, while informality is quantified by estimates of the shadow economy and statistics of labor informality. Instruments are *de-jure* political institutions as they help shape political agency and political competition. These rules are not directly related to informality but through institutional quality. A reduced form aims at estimating the effect of *de-jure* political institutions on machine politics which in turn shapes institution building and hence informality.

De-jure rules are not completely exogenous in the sense that they are broadly influenced by economic outcomes as was explained above. However, they are an exogenous source of variation insofar as they are *strategic moves* that fix the rules of later play. *Strategic moves* "must be observable and irreversible to be true first moves, and they must be credible if they are to have their desired effect in altering the equilibrium outcome of the game"(Dixit & Skeath, 2004, p. 339). In other words, these rules can be deliberately altered and have the power to change the current strategic interaction. Herein lies their ability to shape institutional quality.[3]

It must be underscored that this study does not aim to consider all factors or the ultimate causes of institutional quality, which most likely predates democracy. In the same vein, it does not explain thoroughly the causes of informality as the analysis is highly aggregated and excludes autocratic regimes. This paper simply aims to capture a key source of institution building in a democratic setting and provide empirical support for the hypothesized relationships in Diagram 1. Moreover, this analysis shows that this approach entails policymaking implications that are worth exploring.

In this regard, Acemoglu & Robinson (2001) demonstrate that colonial origins and geographic factors played a fundamental role in the institutional path of nations. Although compelling, this historical determinism offers a poor guide for policymaking as countries cannot change their historical legacy or relocate further from the equator (Woodruff, 2006). Besides, this approach tends to overlook institutional diversity and performance among countries with similar initial conditions, e.g. Costa Rica versus Honduras. Evidence on this diversity indicates the ability of countries to reshape their institutions and change economic and political outcomes.

The IV estimation provides statistical evidence of the hypothesis that EV, given a certain level of political competition, significantly determines institutional quality and therefore informality. *De-jure* political rules such as parliamentary regime, proportional representation, district magnitude, and two aggregated indicators calculated by Principal Component Analysis (PCA) reach joint significance in interaction with *de-facto* institutions (such as ethnic fractionalization and the age of the democracy). Similarly, dummies by geographical regions and OECD membership are strong instruments which perform well jointly in explaining the rule of law.

[1] See Figure 1.1 in Persson & Tabellini (2003).

[2] This criteria follows Mainwaring & Zoco (2007). See Table A2 in the Appendix. Tables and graphs labeled with an initial A can be found in the Appendix.

[3] *Strategic moves* can be seen as special rules that are set in a meta-game played by political agents. Even though institutional quality is exogenous in the model developed in the first paper, the distribution of the tax liability can be interpreted as an indirect *strategic move* insofar as it defines the absolute value of public goods after elections. This occurs through the post-election tax base given by the allocation of producers across sectors.

Although robustness is limited and only a time-series analysis could provide definite evidence, this analysis confirms results already discussed in the related literature on electoral rules and corruption. Thus, holding constant historical characteristics, ethnic fractionalization negatively affects the rule of law as well as proportional rule and a small-district magnitude, while parliamentary systems have a positive impact on institutional quality.

The fact that electoral rules reach individual significance only when combined with *de-facto* institutions points out that EV stems from a combination of *de-jure* and *de-facto* institutions. Electoral rules are not sufficient to enhance political competition and constrain politicians, however, they certainly do matter, although more research is needed to exactly ascertain how (Kitschelt & Wilkinson, 2007a; Mainwaring & Scully, 2008). Precisely, this research is an initial step in this direction. The policy implication from this analysis suggests that effective institutional design must tackle interactions between *de-jure* and *de-facto* institutions that are responsible for the stability of the effective number of parties.

The paper has six sections including this introduction. The second section presents the conceptual framework for and measures of machine politics, institutional quality and informality. Insights from *the political exchange space* and the portfolio theory of electoral investment provide analytical fundamentals of institution building in a democratic market-economy. From there, it is sustained that electoral volatility (EV) is a good proxy of targeted redistribution and that machine politics and institutional quality follow a concave form (or inverted J-shape) relationship. Machine politics and economic duality co-exist at varying extents at the top of such a curve, meaning that they are intrinsically-connected. However, machine politics does encourage informality when political agency focuses upon deals with low-productivity agents and/or agents that benefit from weak enforcement and loose tax compliance, either formal or informal.

The third section introduces the IV specification, studies the characteristics of *de-jure* rules and classifies them according to their centrifugal or centripetal effect in the party system. This sets out the criteria for instrument selection and allows it to finally report and discuss results. The fourth section place results into the literature and discuss the contribution. The fifth section concludes, offers policymaking insights and draws the prospects for further research. Finally, the six section provides an encompassing view of the insights from the first and the second chapters.

2 Conceptual Framework and Measurement

This section elaborates on the two main relationships depicted in Diagram 1. The first tackles the interaction between machine politics and institutional quality and the second, the connection between institutional quality and informality.

2.1 Machine Politics and Institutional Quality

Machine politics refers to targeted redistribution whereby political agents and citizens exchange political goods of medium to high excludability for electoral support. It addresses individual and interest-group demands advanced from peasants or unemployed urban workers to unions and businessmen. Inducements can be distributed at the electoral, legislative or administrative arena and their delivery can be legal (e.g. regulated campaign funding and patronage, pork-barrel legislation) or illegal (e.g. vote-buying, bribery). In the latter case, machine politics is considered corrupt insofar as it violates the legal framework.

The organizational center of machine politics in a democracy is the political party framed by *de-jure* institutions like party manifestos and constitutional laws as well as *de-facto* in-

stitutions like interest-group alliances and electoral mobilization brokerage. The political party, along with intermediaries (from local community leaders to industrial lobbyists), configure a matrix of institutions able to sustain varied forms of organizations. For instance, machine politics in Japan is business-oriented while in Mexico it is also social policy-oriented (Kitschelt, 2007; Magaloni et al., 2007).

Machine politics exchanges two broad types of inducements: a direct material exchange with voters (e.g. gifts, jobs, bribes at the enforcement stage, social policy entitlements), and/or indirect political dealings with public and private business (e.g. contracts, policies, favorable legislation). The first exchange is more *likely* when a majority of voters is poor or where social policy benefits (e.g. public housing, differential access to social insurance) and patronage are matters of political discretion. Historical conditions, such as high initial income inequality and ethnic heterogeneity as well as institutionalization of the civil service after democratic mass enfranchisement, encourage this type of exchange (Kitschelt & Wilkinson, 2007b).

The second exchange is more *likely* to take place when the state plays a very active role in organizing and regulating the economy directly through firm ownership or indirectly via business and financial regulation. The extent of state-interventionism can range from a strongly-coordinated market economy to a liberal-oriented economy in which state intervention is minimized and market competition broadened. A focal point in the political science literature is that liberal capitalism seems to entail more intense political competition. Nonetheless, in terms of economic growth, both types of capitalism could be equally successful; consider for example England and the USA against Japan and South Korea. The prevalence of either form of capitalism and the performance of machine politics in each type is an open research subject.

From an institutional approach, machine politics must be referred to as the institution, that is the rule of behavior, while the political machine points to the organization that plays by this rule, for instance political parties associated with networks of brokers and/or interest-groups. The scope of machine politics and the precise form of the political machine, that is, its salience in total redistributive politics, degree of corruption and efficiency from a social welfare perspective hinges on a myriad of factors that reflects the societal structure and its historical path. It is precisely this great variability in form and performance which makes it a challenging object of study. Still, some patterns suggested by historical cases can be identified.[4]

[4]Machine politics has been typically associated with early 19th Century England and early 20th Century USA (Scott, 1972; Schlesinger, 1995). This term was soon replaced by clientelism, a notion with roots in anthropological studies, and the political science and sociology literature from the late 1970s and early 1980s. Unfortunately, clientelism became an umbrella concept under which many meanings were accommodated at the price of conceptual fuzziness. Curiously, after years of systematic research the definition of clientelism and clientelistic parties by Kitschelt (2010) follow very closely the notion of machine politics and the political machine by Scott (1972). Thus:

"*[...] the machine party deals almost exclusively in* ***particularistic*** *(i.e. individual and small-scale)* ***material rewards*** *to maintain and extend its control over its electorate. [...] A machine regime may thus be characterized as one in which traditional authority, charismatic, and coercive authority are less significant than distributive activity, and in which distributive activity is particularistic rather than collective"* (Scott, 1972, pp.108-109).

"*Clientelistic linkages involve politicians supplying targeted private and small-scale club goods to individuals and groups of citizens who, in a generalized exchange that may extend over iterated rounds of electoral competition, lend their political support to their agent's candidacy for electoral office"* (Kitschelt, 2010, p. 2).

2.1.1 The Political Exchange Space

Redistribution is at the heart of politics as citizens trade votes for political goods provided by political agents. These goods take several forms and can benefit one voter, a group or the entire society. Targeted redistribution has two main characteristics: (1) it is a discretionary allocation that follows the political agent's criteria, and (2) it mainly deals with goods of middle to high degree of excludability (from individual transfers, public jobs, school placements to local roads). High excludability also implies that the political exchange is mainly direct, that is voters clearly identify the political provider who in turn is able to claim the credit and build an individual reputation. Through targeted goods politicians build their credibility among voters and solve, at an individual level, the commitment problem (i.e. credibility of future promises).

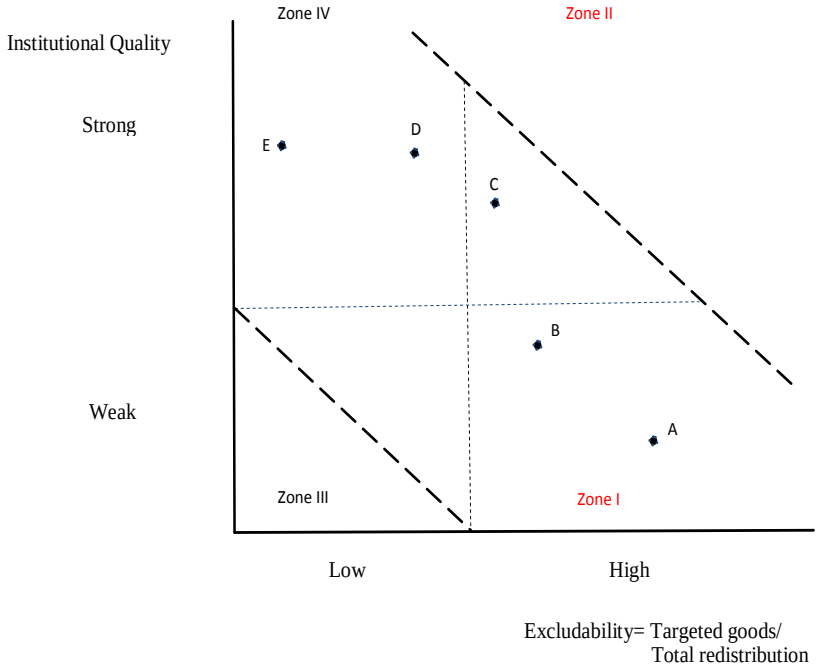
In contrast, programmatic redistribution is characterized by: (1) allocation rules set by political bodies (e.g. parties, parliament, federal assembly, etc.), and (2) delivery of political goods with medium to low excludability (e.g. industrial subsidies, interregional highways, universal education, national security). Low excludability implies an indirect political exchange since such provision rests on third-party enforcement not entirely controlled by a single politician. As a result, credit claiming is more diffused and is usually associated with political bodies rather than specific individuals. This redistribution implies lower discretion for political agents than targeted redistribution due to tighter constraints and monitoring, guaranteeing the delivery of inclusive political goods (otherwise, politicians would defect on their promises). In other words, public goods dominate total redistribution when institutional quality is beyond a certain minimum.

Political exchange is embedded in a broader environment that ranges from weak to strong institutionalization. Strong institutionalization means an independent third-party that enforces the law so that the protection of property rights is guaranteed and transaction costs are lowered. Here the institutionalization of the environment is proxied by an index of the rule of law, which is a robust indicator of overall institutional quality. It measures the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime and violence.[5] Notice that neither a weak rule of law prevents politicians from delivering public goods nor does a strong rule of law rule out targeted benefits; in most cases, politicians find it optimal to offer combinations of both types of redistribution. Graph 1 illustrates these ideas in the *political exchange space*. Points in this plane represent combinations of these two broad types of political goods at varying levels of the rule of law. It aims at portraying possible paths of political agency and institution building in democratic market-economies.

[5]The index takes values from -2.5 to 2.5, with higher values corresponding to stronger rule of law (Kaufmann et al., 2010). Alternative measures of institutional quality are indexes of regulatory quality, efficiency of the judiciary, constraints on the executive, civil rights, and political liberties. All these are highly correlated. See the matrix of correlations in Table A3.

Graph 1

The Political Exchange Space



Variables on both axes are scaled so that they range from 0 to 1. A movement from left to right on the y-axis indicates stronger rule. This axis is divided into two equal segments so that the first and the second segment indicate weak and strong rule of law respectively. This division is arbitrary and helps us to start the analysis, for instance, a different criteria could argue that values lower than 0.7 represent weak rule of law. The x-axis measures the ratio of total political goods to targeted goods, that is the degree of excludability of the total political goods exchanged. In a narrow definition of targeted goods, this ratio can be seen as the percentage of the public budget devoted to particularistic goods. A movement from the bottom to the top indicates that targeted goods increase in the total redistribution so that voters benefit from the political exchange mainly at an individual level. As before, the x-axis is divided into two arbitrary equal segments to convey low and high excludability.

The *political exchange space* has four zones. Machine politics, or targeted redistribution, dominates the political exchange in zone I and II. According to institutional quality, in zone I, machine politics is poorly constrained, where as in zone II it is constrained. Likewise, machine politics is dominated by programmatic redistribution in zone III and IV (as the latter comprises more than 50 percent of total redistribution), and programmatic redistribution in zone III is more uncertain than in zone IV. Dotted lines constrain the area of feasible points in Zone II and III ruling out points in the southwest and northeast of the space since dominant programmatic redistribution at extremely weak rule of law is as counterintuitive as dominant particularistic redistribution under a very strong rule of law.

A point like A at the top of Graph 1 conveys that targeted redistribution dominates total redistribution under weak rule of law (e.g. Bolivia). A middle-income country like India could be placed at point B. Developed countries like Italy with a long tradition of

particularistic politics would be at point C, while Japan would lie at point D due to better enforcement and its business-oriented clientelism. A developed country like Sweden with a long-standing commitment to socialist redistribution and strong rule of law could be placed at point E. Notice that the relative value of targeted redistribution is higher at point A than at point B, but the absolute value of B can be higher than A. This is because institutional quality and income simultaneously improve (e.g. 70 percent of 100 vs. 50 percent of 300).

In zone I and III, social exchanges entail important uncertainty, that is, insecurity over property rights and high transaction costs. The political exchange is more discretionary and faces acute commitment problems which raises incentives to extract rents from public office and exacerbates the moral hazard in the selection of candidates (insufficient monitoring and accountability). Corruption naturally thrives in this environment. This term is defined as "the misuse of entrusted power for private gain"(Thomas & Meager, 2004, p. 3) where misuse means a violation of the law, committed by public and/or private agents. Hereafter corruption and rent-extraction are interchangeable terms and are assumed to always involve, at least, public agents. Measures of corruption are a main component of the index of the rule of law.

In a weakly institutionalized environment, agents must invest resources to privately guarantee their rights and enforce their contracts within and across groups. It is precisely upon uncertainty and these particularistic demands, that political agency emerges in the first place, for agents associate in small groups (along cultural, racial or geographical lines) to trade safely, given the limited degree of impersonal exchange (North et al., 2009). This is a typical scenario of a poor country where market-oriented institutions are incipient.

Historically, political agency has begun by delivering targeted political goods to some groups (i.e. guilds, royal charters), and as society has orientated itself toward capitalism, interest-groups have thrived and demanded political agency thereby intensifying redistributive pressures. In this view, all paths of political exchange start out from zone I and thereafter move towards any of the other zones. That a society stays in the neighborhood of point A or moves towards point B or D in Graph 1 depends not only on a positive relative profitability of the investment in public goods, but more importantly on the political power to carry out such investments. Good examples of countries transitioning toward being high-growth economies where industrial elites have highly profitable alternatives to exploit are the English on the eve of the Industrial Revolution or the South Koreans in the 1970s.

Cox (1987), Lizzeri & Perssico (2003) and Khan (2000, 2005) illustrate how the English and South Korean industrial elites achieved effective political representation and obtained policies favorable to their capitalist expansion. These machine politics initially played by the rules of a corrupt game, captured political agency and thereafter expanded the provision of public goods thus enhancing state capacity. Politics there transformed into growth-enhancing machine politics; although not completely rid of corruption as the South Korean case shows. Financial patrons of these machines were more materially-progressive than their mass electorate, which was mostly poor and prone to give up their marginal political power for immediate blandishments (Scott, 1972).

Consistently, machine politics could be growth-diminishing too. This takes place when resources and political power are mainly controlled by low-productivity or traditional groups less inclined to capitalist and/or modern political values (which includes attitudes against enforcement). Also, when elites are very fragmented and find it too costly to further pro-market institution building. Cases range from the Philippines with disappointing economic success, to Mexico with better but limited economic performance.[6]

[6]Kahn notes that "*historical examples show that a number of different patterns of patron-client competition are compatible with the rapid emergence of such a capitalist sector, while many other patterns of factional competition act as a brake on this transformation*"(2005, p. 722).

In this framework, rent-extraction and targeted redistribution, or pork-barrel politics, are not the same phenomena. They are closely related in a weakly institutionalized environment, and both are expected to diminish relative to programmatic redistribution as the rule of law is strengthened. However, under better institutions, rent-extraction is expected to decrease much more than targeted redistribution. This is so because monitored and constrained politicians have a trade-off consisting of being ousted from office if caught in corrupt practices or being reelected when delivering resources to core-voter constituencies.

In summary, *the political exchange space* conveys that targeted and programmatic redistribution are both part of a politician's portfolio, of which is placed at varying degrees of institutional quality. In an evolutionary perspective, institution building starts out in zone I where targeted redistribution is dominant, and could proceed toward any of the other zones. Hence, multiple paths, or multiple social equilibria, exist in the development of market-oriented economies.

2.2 The Portfolio Theory of Electoral Investment

The portfolio theory of electoral investment developed by Magaloni et al. (2007) sheds light onto a mechanism by which political agency veers off from dominant machine politics through democratic political competition. This process is illustrated by recent transformations in Mexican politics where the dominant party Partido Revolucionario Institutional (PRI) started losing power. This party was a long-standing incumbent that used intensively targeted redistribution and corrupt practices but that has faced political competition since the late 1980s.

According to this theory, politicians diversify their investment strategies to obtain voters' support and minimize electoral risk. Investment strategies are made of public and private goods whose yields are votes. Risk is measured by the variance in the total vote that is given by known variances and covariances of the electoral returns of public and private goods. Public goods bring uncertain electoral returns that could capture broad electorates, while targeted goods yield risk-free electoral returns but are very costly, especially with heterogeneous electorates. Budget constraints and transaction costs in targeting make complete reliance on targeted redistribution unfeasible (except perhaps when voters are exceptionally poor). The degree of risk acceptable by the incumbent party also determines how much it invests in each type of political good.[7]

The model predicts that targeted redistribution will be higher when yields from private goods are much larger than those of public goods (poor electorate) or when the difference in yields is small, as uncertainty makes the incumbent prefer private over public goods. More

[7]The incumbent's problem is to minimize risk (S), which is the variance in vote returns of his electoral portfolio, subject to a vote constraint (V), that represents the desired level of expected electoral support. Therefore,

$$\min S = \alpha^2\sigma^2 \quad s.t. \quad V = \alpha E[X] + (1-\alpha)Y$$

where α is the proportion of the incumbent's budget devoted to public goods, denoted by X, and the remainder $(1-\alpha)$ is the proportion of private goods, denoted by Y. Private goods bring certain electoral returns (Y), the private goods return is uncertain although its expected vote value follows a known distribution with mean and variance given by $E[X]$ and σ respectively. It is assumed that $Y < E[X]$. The optimal share of public goods is:

$$\alpha^* = \lambda(E[X] - Y)/2\sigma^2$$

where λ is a Lagrange multiplier that denotes incumbent's risk aversion. Notice that a large difference in yields tilts redistribution in favor of those goods with higher electoral returns, whereas a small difference tilts it toward private goods.

private goods will also be delivered when public goods are riskier (because of more political competition) and the incumbent is more risk-averse. Magaloni et al. (2007) test their theoretical predictions by using data on social expenditure in a poverty-alleviation program and voting data from 1989 to 1994 in 2,400 municipalities.

They find that clientelistic spending and socio-economic development exhibit an inverted J-shape relationship: that is a concave form in an x-y plane where the x-axis represents economic development and the y-axis measures absolute targeted spending. In the poorest localities, targeted spending is higher than in the rich ones, but lower than in the intermediate development localities. The first part of the previous statement is in line with well-known theoretical insights as rich voters prefer public goods over private transfers, while poor voters can be cheaply bought off. The second part is, however, less obvious. The authors underscore that particularistic redistribution is most prevalent in middle-range levels of development like in semi-urban localities and smaller cities where heterogeneous voters are highly susceptible to individual inducements and vote-buying.

Therefore, political competition in this environment induces more investment in public goods provision as more voters can be reached. However, increasing risk makes the risk-averse incumbent intensify targeted spending. Magaloni et al. (2007) find that poorer municipalities are certainly less risky than richer municipalities where competition has stabilized into two and three parties. In intermediate-development localities with bipartisan and multi-partisan electoral races, the risk is highest.

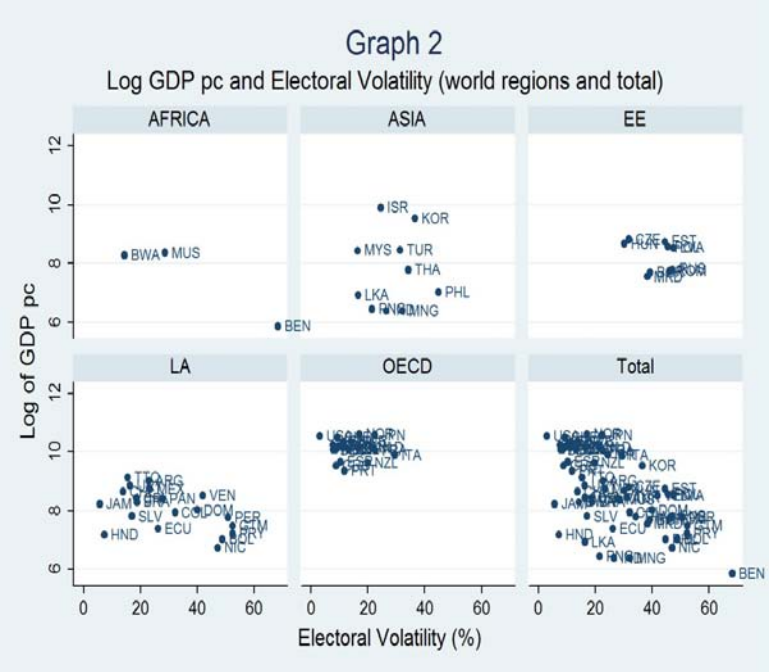
From a more general historical perspective, Scott (1972) states that in poor localities most of the electorate are locked-in by relationships of traditional allegiance; in more economically-dynamic areas, like urban neighborhoods full of poor but freemen, the electorate are amenable to the machine's treats whereas in rich areas, substantial portions of middle-class and collectively-organized workers represent *issue-oriented* voters. Locked-in electorates reside in contexts of poverty and (sometimes) violent coercion that severely hinder political competition as few incumbents monopolize politics. As suggested by modernization theory, political monopoly erodes as income rises and the median voter becomes wealthier and able to demand political representation with programmatic contents.[8]

These within-country findings can be viewed from a cross-country perspective by using EV as a proxy of targeted redistribution. Insofar as EV is a measure of electoral risk, and increases in this risk raise targeted redistribution, then EV allows it to track the extent of machine politics in total redistribution. Electoral volatility was introduced in the first paper and is briefly recalled here.

Electoral volatility indicates the net percentage of voters who changed their party loyalties between elections; the higher the electoral volatility, the more unstable the party system is either because of party turnover or voters' changeable allegiances. Graph 2 shows the average electoral volatility against the logarithm of the average GDP per capita. Electoral volatility is calculated for lower chamber elections of 64 democracies classified geographically and by OECD membership since the 1990s.[9]

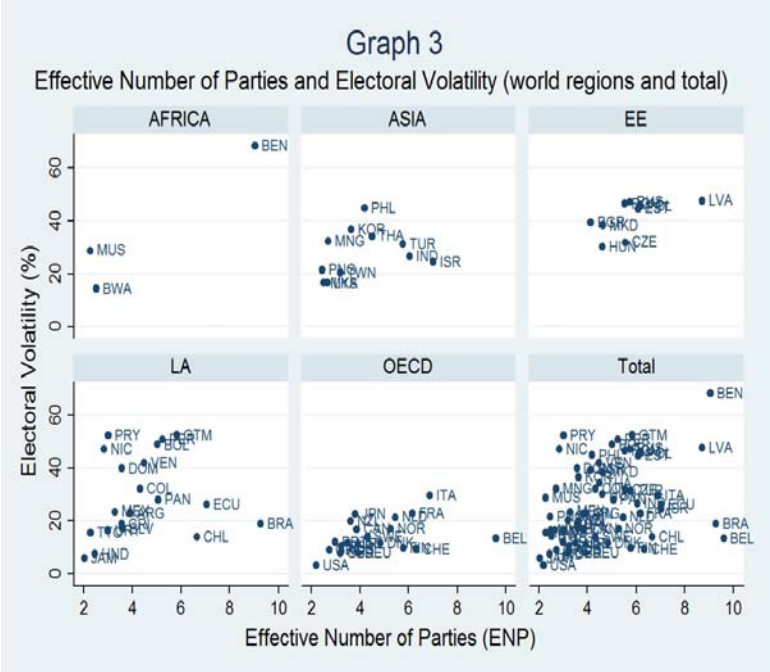
[8] Political monopoly has been typically associated with the term clientelism and theoretically studied (Robinson & Verdier, 2003; Medina, 2007). On clientelistic competition, analytical efforts are still to be developed.

[9] The electoral volatility formula is $EV = (\sum_{1=n}^{n} \mid p_t - p_{t-1} \mid)/2$, where n is the number of parties with at least one vote and p_t is each vote share of the party at time t (Pedersen, 1979). Tables A1 and A2 provide detailed data and their sources.



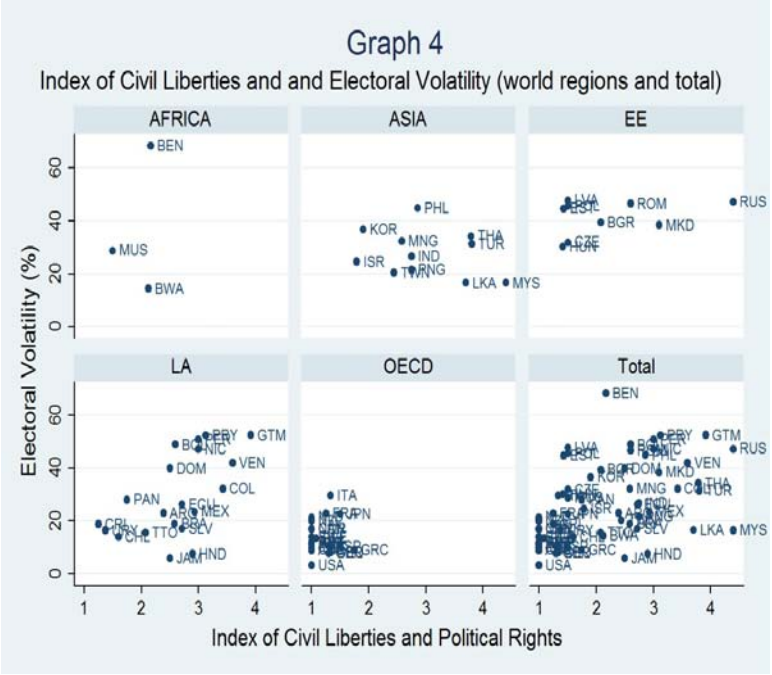
The negative correlation between EV and income in the total sample is undeniable. Mean EV in OECD countries is about 14 percent; in Asia, Africa and Latin America it reaches 31 percent; and in Eastern Europe it is 41 percent. However, the case of low-income democracies like Jamaica and Honduras with low EV, casts doubt upon a linear relationship between electoral risk and development. Moreover, important dispersion among young democracies suggests the need to dig deeper (i.e. Russia's EV is 1.5 times that of Hungary). Differences in the intensity of political competition are partly explained by the effective number of parties (ENP) , which is a measure of the fragmentation of a party system. Graph 3 suggests a positive relationship between ENP and electoral risk.[10]

[10]The effective number of parties is computed by the formula: $ENP = \frac{1}{\sum_{1=n}^{n} p_i^2}$, where n is the number of parties with at least one vote and p_i^2, the square of each party's proportion of all votes (Laakso & Taagepera, 1979). It indicates the number of significant parties by weighting parties according to their respective vote share. This formula corresponds to the inverse of the more familiar Herfindahl index in economics that measures market competition.



Clearly, young, middle-low income democracies like the ex-republics of the Soviet Union or recently democratized countries like the Philippines exhibit larger EV than richer, older democracies. By taking a closer look, one can notice that Jamaica and the USA have a similar, effective number of parties, about two, and low EV (5.7 and 3.0 respectively). It is important to state that Jamaica's per capita GDP is 10 percent that of the USA. Also, while Russia has a 5.7 ENP, Hungary has a 4.6 ENP; and Russia's income per capita is 42 percent that of Hungary's GDP per capita. Having said this, it is plausible that the relationship between EV (electoral risk) and income across these democracies follows a concave form as the portfolio theory of electoral investment states. Naturally, serious research is required to provide a formal test of these insights presented here just in a descriptive way.

Because income and institutional quality are closely related, the relationship between electoral risk and institutional quality could take a concave form as well. Electoral volatility and the rule of law have a simple correlation of -0.59 and their graph is very similar to Graph 2. In order to relate the quality of a democracy to electoral risk, Graph 4 below compares EV with the average of the indexes of political rights and civil liberties, which are main components of the rule of law. The average for 1990-2010 is based on Freedom House's statistics. These indexes are measured on a scale from 1 to 7 where 1 represents the highest degree of freedom and 7 the lowest (a score between 1.0 and 2.5 are considered free, between 3.0 and 5.5 partly free and between 5.5 and 7.0 not free).



On average, countries with repressed democracy and where violence is present in political competition, exhibit higher EV, highlighting an inverse relationship between democratic quality and EV. However, a linear relationship is far from explaining the whole story. Electoral risk is low in poor countries such as Honduras and Jamaica, and so is it in rich countries such as the USA and the UK. While in these two poor countries, strong bipartisan politics works amidst political violence and coercion, in the rich ones, two and three ENP compete in a strongly institutionalized environment.

Insights from theory, history and quantitative evidence support the idea that institutional quality and electoral risk could have an inverted J-shape form. Accordingly, under poor institutional quality there are important entry costs in politics due to violence so that long-lasting incumbents monopolize party representation and keep electoral risk low. A dynamic entry of parties, by virtue of economic progress and/or redistribution of political power, raise political competition and thereby increase pressures on targeted redistribution. Institution building could then be furthered whenever parties find such *strategic moves* feasible and beneficial. For example, Geddes (1994) sustains that politicians abandon administrative patronage and instead invest in state building capacity when competition between two parties of equal power is intense and swing voters increasingly value public goods. Nonetheless, the step from intense political competition to institution building cannot be taken for granted as such increasing redistributive pressures can find their way through the existing institutional framework (Acemoglu, 2009) or even worse, through violence and coercion.

The party system would reach stability once political agency is sufficiently constrained in the polity's eyes so that electoral risk diminishes. At such point, the commitment problem is alleviated and institutional building can be deepened.[11]

2.2.1 Measuring Machine Politics Through Electoral Volatility

Machine politics is a system of exchanges that takes place at electoral (voter mobilization, campaign funding), legislative (business regulation, pork-barrel expenditure) and governmental (patronage, law enforcement, spending allocation) levels. Quantitative research has

[11] Shepsle & Weingast's (1981) concept of structure-induced equilibrium provides analytical foundations to understand institution building in an extreme, stable democracy like the USA.

mainly focused on study cases and specific forms of targeted redistribution. Next, some studies mainly from Latin America are briefly mentioned without any pretension of completeness. For a comprehensive view of the state of the art, see Kitschelt & Wilkinson (2007a).

On voting patterns and vote-buying, Ames (2001), Stokes (2005) and Lyne (2008) offer evidence on Brazil, Argentina and Venezuela respectively. On this subject, Schaffer (2006) brings together theoretical considerations and case studies from Latin America and Asia. Desposato (2006) studies party cohesion and discipline in Brazilian legislations, while Magaloni et al. (2007) analyze the expenditure allocation in a Mexican poverty relief program. Drazen & Eslava (2005) and Eslava (2005) study the pre-electoral dynamics of government spending and voter behavior in Colombian municipalities, and Arulampalam et al. (2009) carry out a similar study for India.

Comparable cross-country quantitative evidence was recently built by Kitschelt (2010, 2011a, 2011b), who develops an index of clientelistic efforts of parties across the world that additively combines parties' scores from five areas of targeted redistribution. The index is based on an expert survey conducted in 2008 and 2009, covering 506 parties in 88 countries. This research finds a strong correlation between the clientelistic index and the rule of law (-0.8), which beautifully connects to the inverse relationship between electoral risk and income aforementioned.[12]

The portfolio theory of electoral investment and cross-country data on EV provide compelling arguments supporting the idea that electoral risk and targeted redistribution go hand in hand. Higher risk causes more targeted redistribution because there are more contestants in the electoral race and/or more swing voters to be captured. There is also some support of a concave relationship between targeted spending and economic development/institutional quality.

The assumption that electoral risk and targeted redistribution are correlated implies that machine politics will also be tightly linked to electoral risk. Consequently, I operationalize electoral risk with a measure of EV. Determinants of EV and related literature are introduced next.

Electoral volatility is a measure of the stability of the party system, which is the set of political parties that interact in patterned ways (Mainwaring & Zoco, 2007). Stability means that there are: (1) identifiable patterns of political competition, that is who the main parties are and how they behave; (2) strong roots of political parties in society, i.e. the majority of the electorate comprises core voters (relative to swing voters); (3) political actors that accord legitimacy to parties such that no politicians run for office outside their parties (low intra-party competition). The lower the EV, the more stable the electoral competition. Table 1 shows descriptive statistics of EV by geographical regions and OECD membership.

[12] Kitschelt (2010) identifies five "currencies" of clientelistic exchange. (1) *Outright gifts*: goodies valuable to voters like food, clothes, building materials. (2) *Preferential access to material advantages in public social policy schemes*: e.g. social programs in which administrators enjoy great discretion over eligibility. (3) *Preferential access to employment in the public sector or in the publicly regulated private sector*: patronage. (4) *Preferential access to government contracts or procurement opportunities*: e.g. contracts in civil engineering/construction or defense goods. (5) *Application of regulatory rules issued by government agencies*: e.g. zoning laws, construction and environmental laws, product safety laws. This index will be soon publicly accessible through the Database of Political Institutions (DPI) of the World Bank. Unfortunately, this research could not have early access to this data.

Table 1

Electoral Volatility (EV), Effective Number of Parties (ENP) and Associated Variables

	EV (1990-)	EV (1945-)	ENP (1990-)	ENP (1945-)	Democratic Executive (c. years)	Democracy Age (years)	Party Age (years)	Turnout (%)	Invalid Votes (%)	N (region)
AFRICA	37.10	34.13	4.61	4.56	7.55	33.00	22.54	73.27	3.58	3
	27.94	*30.04*	*3.85*	*3.88*	*0.05*	*13.89*	*12.75*	*9.61*	*2.79*	
ASIA	27.72	28.02	4.06	3.94	14.20	34.27	26.80	70.84	3.31	11
	8.97	*9.51*	*1.60*	*1.01*	*13.05*	*19.02*	*14.37*	*8.58*	*2.68*	
EE	41.23	41.23	5.68	5.68	8.45	17.78	10.91	62.74	2.40	9
	6.68	*6.68*	*1.33*	*1.33*	*1.70*	*0.97*	*7.97*	*8.28*	*2.05*	
LA	28.96	29.29	4.32	4.20	15.97	35.25	41.20	67.25	8.05	20
	15.56	*14.15*	*1.82*	*1.97*	*10.07*	*33.10*	*34.39*	*13.44*	*7.16*	
OECD	13.74	11.11	4.51	3.95	56.60	99.48	64.91	73.70	2.01	21
	6.40	*3.81*	*1.73*	*1.22*	*19.87*	*48.53*	*33.38*	*11.99*	*1.70*	
Total	**25.86**	**25.01**	**4.54**	**4.30**	**27.54**	**53.59**	**41.37**	**69.63**	**4.26**	**64**
	14.89	*15.07*	*1.82*	*1.69*	*24.69*	*47.10*	*33.58*	*11.77*	*5.05*	
N	64	64	64	64	64	64	64	64	63	

Notes: Mean value, standard deviation below in smaller and italic numbers. EV and ENP for Latin American countries from Payne, Zovatto & Díaz (2007). For the rest of countries data was obtained by request from Mainwaring, Scott. Calculations of the author based on electoral data at party level for lower chamber elections. Democratic elected executive: It accumulates the consecutive years in which the executive has been competitively elected, "tensys" in the Database of Political Institutions (DPI) (World Bank, 2009). Democratic age is calculated as 2008 minus the first year of democratic rule. First year of democratic rule is from Persson & Tabellini (2003) except for Benin, Macedonia, Mongolia and Panamá where it corresponds to the first year of lower chamber elections. Partyage is the average of the ages of the first two government parties and the first opposition party, DPI. Averages over 1990-2009. Turnout and Invalid votes from IDEA (http://www.idea.int/vt/viewdata.cfm).

Two averages of EV were calculated: the first from 1990 until the last election available, and the second from 1945 until the last election as well. Tests of equal means were performed and not rejected. Consequently, the first mean is used hereafter in order to compare old and young democracies in the same period of time. However, it must be highlighted that the standard deviation of EV in the old OECD democracies in the first column doubles the one in the second column, indicating higher variability across these countries since the 1990s.

Madrid (2005), Mainwaring & Torcal (2006) and Mainwaring & Zoco (2007) identify three main determinants of EV in a cross-country analysis: (1) the ENP as new entrants in elections induces competition and uncertainty. Also, party fragmentation is closely related to ethnic fractionalization;[13] (2) the time period when the democracy was born. Democracies established after the *Third Wave of Democratization* (1974 and onwards) are much more volatile than older democracies because voters' political identities lack roots and are more difficult to forge. Political campaigning has access to new technologies like the media that lowers the costs of running for office individually and weakens party discipline; (3) low ideological differentiation between parties. When voters perceive parties as substitutes, their loyalty vanishes and inducements play a main role.

[13]Ethnic fractionalization is measured by the probability that two randomly drawn individuals from the population belong to two different groups (Alesina et al., 2003).

As was seen in Graph 3, the average ENP and EV are positively correlated. Nonetheless, important dispersion around a positive slope still exists. Compare for example the cases of Switzerland and Mauritius: the former has 6.3 effective parties and an EV of about 9 percent, while the latter has 2.2 effective parties and an EV of 28 percent. This dispersion suggests that party structure and electoral risk do not follow a linear relationship. The fact that ENP and EV are highly aggregated measures, over time and within-country electorates could be hiding important features that prevent us from understanding patterns of political development. More detailed data would shed light on this subject and can be built from extant studies waiting to be integrated into comprehensive research.

To finish this section, some within-country studies on EV are briefly mentioned. These studies report findings in the same direction of cross-country analyses and make interesting additional points worth exploring. Heath (2005) finds that EV in India is determined by how party representation matches social cleavages in each state and that catch-all politics is associated with more volatile states. In Brazil, Vitullo (2001) points out that multiple parties and the candidate-centered party system increases EV, which is especially high in poor states. Nonetheless, Lyne (2005, 2008) and Santos (2008) find evidence of more stability in the party system in recent elections due to coalitional politics. Gutierrez (2004) and Hoyos (2005) establish the effect of electoral reforms in the 1990s in Colombia. These authors find that reforms encouraged party entry to the point that *electoral enterprises* flourished and EV notably increased.

2.3 Institutional Quality and Informality

The *political exchange space* is a tool to rationalize the relationship between institution building and machine politics. Insofar as institutional quality and income follow an overall positive relationship, this tool also conveys key points on the relationship between institutional quality and informality, or more generally, economic duality, which is the economic outcome we want to understand.

Before developing the previous idea, let us recall the notion of informality. It is defined as the economic activity that produces legal output but does not comply with tax and business regulation. It has a higher incidence among low income agents that produce on a small-scale, use low-productivity technology and are subject to tight capital constraints. Firm informality, also referred to as the shadow or underground economy, is measured by the legal value-added output, creating activities that are not taxed or registered (the electricity and currency demand approaches). Labor informality is measured as the share of workers in informal jobs like salaried workers in small firms, own-account workers as well as family workers.

Thus, in Graph 1, the *political exchange space*, a movement along the y-axis, from weak to strong rule of law, implies income growth and the emergence of market-supportive institutions. In the process, economic agents reallocate factors from traditional/low-productivity sectors to modern/high-productivity ones. Only after a certain level of income, presumably after a middle-level, the dual economy is clearly outlined. Before duality, the economy was rural and thereafter it will become a more matured capitalist society. Naturally, factor reallocation changes political demands and brings about distributional conflict between stakeholders of the old and new economy.

The portfolio theory establishes that polities at the middle-level of development experience an increasingly higher electoral risk and hence intense targeted redistribution in the hands of risk-averse politicians. Rent-extraction and other forms of corruption are also likely because the rule of law is still at weak or middle ranges. As economic duality manifests at middle development as well, this implies that economic duality and corrupt machine politics

are inherently connected.

Linked with this reasoning, literature on informality has pointed out two main causes of informality: (1) high entry barriers to formality (taxes, regulation) and (2) poor quality of institutions (corruption, weak legal system) (Schneider & Enste, 2000), where corruption has certainly been a main suspect.

Table 2 presents descriptive statistics by regions of firm and labor informality, logarithm of income per capita, indexes of the rule of law and corruption, costs in doing business as well as direct taxes as a percentage of total revenues. Firm and labor informality have a high correlation (0.77) so that the second is expected to be a reflection of the first (i.e. informal firms create informal employment). It is clear that countries in Latin America (18) and Africa (3) have larger firm informality, over 41 percent, lower income and higher business costs. Latin America registers the worst record in rule of law and corruption.

Table 2

Firm and Labor Informality (%) and Associated Variables

	Firm (% GDP)	Labor (%labor force)	Log GDP per capita	Rule of law Index	Doing Business Index	Direct tax (% revenue)	N (rol)
AFRICA	41.08	14.16	7.50	0.37	61.97	22.58	3
	10.06	*3.38*	*1.43*	*0.74*	*90.27*		
ASIA	33.39	32.48	7.72	0.20	21.77	42.27	11
	10.77	*15.60*	*1.31*	*0.59*	*16.89*	*13.64*	
EE	34.37	16.34	8.23	0.28	11.06	26.60	9
	8.50	*9.47*	*0.52*	*0.65*	*6.77*	*8.09*	
LA	42.12	36.52	8.03	-0.42	49.39	31.41	20
	13.35	*11.74*	*0.70*	*0.62*	*51.28*	*12.25*	
OECD	16.60	11.92	10.11	1.54	6.77	49.96	21
	5.45	*5.57*	*0.34*	*0.35*	*7.01*	*15.33*	
Total	**30.77**	**23.60**	**8.68**	**0.46**	**25.92**	**39.29**	64
	14.44	*14.93*	*1.27*	*0.96*	*39.13*	*16.08*	
N	62	60	63	64	63	48	

Notes: Mean value, standard deviation below in smaller and italic numbers. Log of GDP per capita (constant 2000 US\$), averages over 1990-2009. World Bank Indicators (http://data.worldbank.org/indicator). Firm informality: % of official GDP using the DYMIMIC and currency demand method. Average of 2000, 2002, 2003. Schneider (2008, p.144). Labor informality: ratio of own-account workers and contributing family workers over total employment, average over 1999-2008. Data from Labor Force Surveys. ILO Statistics (http://laborsta.ilo.org/). For Bulgaria, Canada, Denmark, Finland, UK, Poland, Romania, Sweden and the US labor informality corresponds to self-employed (% of total employed), 2005 values, World Bank Indicators. Rule of law index, average over 1996-2009, Kauffman et al. (2010). Ease of doing business Index ranging in [1,183] (1=most friendly environment); Cost of business start-up procedures (% of GNI per capita); Direct taxes corresponds to taxes on income, profits and capital gain (%of total taxes): 2005 values, World Bank Indicators.

Dreher & Schneider (2010) study the relationship between corruption and the shadow economy, finding that in high-income countries, going underground limits corruption, whereas in low and middle-income countries, going underground stimulates corruption. In the first case, corruption and the shadow economy are substitutes in the sense that the existence of the informal sector reduces the propensity of political agents to extract bribes. This is so

because agents take shelter in the underground economy when public officials turn too extortive. This negative relationship is referred to as the *dodging the grabbing hand hypothesis*. In the second case, these two phenomena are complements because corrupt political agents collude with economic agents to underreport the tax liability or waive enforcement. This positive relationship corresponds here to the *shaking the grabbing hand hypothesis*. Despite the fact that these results are contingent on econometric specification and the measure of corruption, they make suggestive points that match very well with the idea that machine politics works differently according to the institutional environment in which it is embedded.

In this view, understanding how machine politics moves away from a loosely constrained environment to one in which political agency focuses on institution building is tantamount to understanding how economic dualism soundly progresses toward a fully/high-productivity market-economy. This implies to characterize the diversity of pathways in *the political exchange space*.

One path towards an *inferior* equilibrium unfolds when political agents and citizens enter into deals that induce little investment in institution building, especially those that are related to constraints on political agency. Little programmatic redistribution is reflected in sluggishly-downward movements along the y-axis. Poor state capacity, insecurity over property rights and high transaction costs limit the *long-run* expansion of the high-productivity sector and political machines are growth-diminishing or at most, growth-stagnant. As the grabbing hand of politicians is shaken more often than not, the low-productivity/informal sector remains large.

The Import Substitution Industrialization (ISI) strategy was brought up in the first paper as an example of this kind of collectively-detrimental deal between voter-producers in the modern sector, and politicians. This strategy granted market power to modern producers (trade protection, monopoly rights, etc.) and exempted them from taxes, thereby hindering total productivity and investment in public goods.

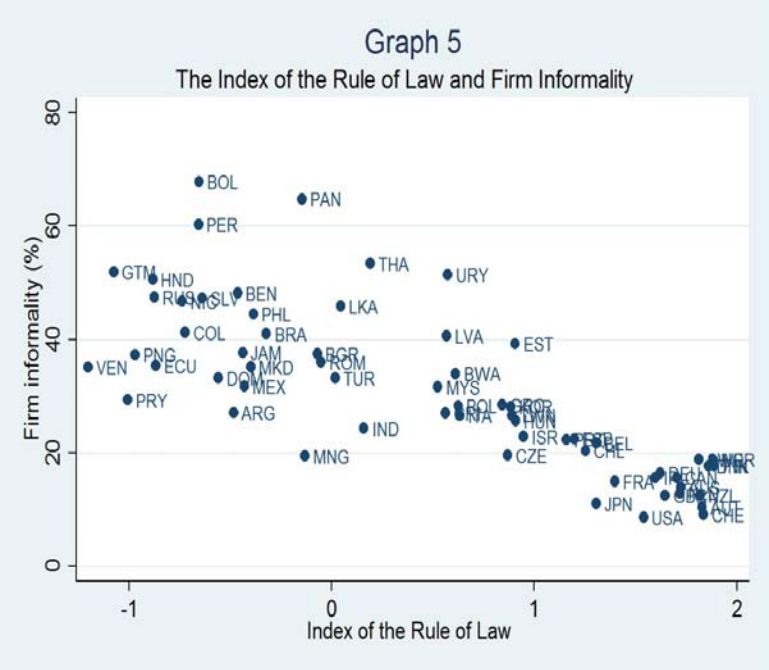
But machine politics is also able to target traditional/informal producers. Tendler (2002) documents how politicians practice clientelism with clusters of informal firms in Brazil. In the same line, Cross (1998) and McTigue (1998) find that informal Mexican workers are politically-active in seeking protection for their activities. In these deals, politicians have no incentives for fighting for law and order as they exchange electoral support for enforcement waivers. This evidence casts serious doubts on the romantic view of producers taking shelter from corrupt officials in the informal sector who do not take an interest in politics (De Soto, 1989).

A political machine that makes corrupt deals with both formal and informal producers, turns out particularly perverse: those deals shrink the tax base, increase entry barriers to the formal sector and weaken enforcement (i.e. lower relative costs of informality). In this way, the distributional conflict between voters is intensified and pro-market institution building is hindered. Such conflict is even more exacerbated in ethnically-fragmented societies where machine politics exploits voters' cultural identity over voters' income/productivity level, making coalitional politics highly unstable and inefficiently redistributive.[14]

Cases such as the UK or South Korea illustrate paths of *superior* equilibrium in which initially corrupt (or non-regulated) deals between politicians and high-productivity producers brought positive spillovers to institution building so that the low-productivity sector was absorbed. Here machine politics was growth-enhancing as political agency supported substantial investments in public goods and, more importantly, managed to restrict corrupt practices and build accountability by *strategic moves* in political institutions. This pro-

[14]Recent within-country studies combining theoretical and empirical analyses of clientelistic politics in these ethnically-diverse democracies are Anderson et al. (2011) for India and Bandiera & Levy (2010) for Indonesia.

cess amounted to shaking the grabbing hand in a first instance, and thereafter shackling it. Herein lies the logic of the inverse relationship between informality and institutional quality shown below in Graph 5.



3 The Instrumental Variable Approach

The central hypothesis is that machine politics determines informality via institutional quality; however machine politics and institutional quality are jointly determined. In consequence, the instrumental variable approach is applied in order to estimate the impact of machine politics on informality. Instruments are searched for among determinants of EV, which is the proxy variable for machine politics. The conceptual premises are:

1. Electoral volatility signals the extent of targeted redistribution relative to programmatic redistribution in a democracy. High EV indicates important political competition, an unstable party system and pro-market institution building not yet consolidated. Provided that there is no political monopoly based on the exploitation of voters' poverty, low EV indicates a stable party system and a strongly institutionalized environment.

2. Instruments are searched for among *de-jure* political rules (electoral and constitutional rules) which regulate political competition and hence EV. These are an exogenous source of variation insofar as they can be *strategic moves* in the sense that they fix the rules of later play. Herein lies its ability to shape institutional quality.

The second premise refers to the exclusion restriction requiring that these instruments have no direct impact on informality other than their effect through institutional quality. Conceptually, exogeneity of these *de-jure* rules comes from the political incentives that motivated such rules as well as the factors that made them *strategic moves*, that is observable, irreversible and credible first moves.[15]

[15]Thus, this type of political reform could be motivated by ideological or geopolitical changes, not directly related to the extent of informality, that modify the number of competing political agents and their strategies to facilitate collective decision-making and increase accountability (e.g. inclusion/exclusion of political groups, membership in a trade/monetary area). Also, building credibility is a process mainly defined by the characteristics of political competition in which underlying economic forces are not enough to guarantee the

The mechanism is expressed in the following expressions:

$$I_i = c + \alpha Q_i + \mathbf{X}_i'\beta + \epsilon_i \tag{1}$$

$$Q_i = c_Q + \alpha_Q EV_i + \mathbf{X}_i'\beta_Q + \mu_{Qi} \tag{2}$$

$$EV_i = c_V + \alpha_{EV} Z_i + \mathbf{X}_i'\beta_{EV} + \mu_{EVi} \tag{3}$$

where I_i stands for informality, Q_i for institutional quality, EV_i for electoral volatility, and Z_i represents instruments. The vector of covariates is X_i and error terms are ϵ_i and μ_i. The IV approach is valid whenever: (1) instruments significantly explain variability of the endogenous variable, and (2) they are a source of exogenous variation to the dependent variable (I_i) (exclusion restriction). This means that conditioned on the controls in the regression, instruments affect the dependent variable only through the endogenous variable. Technically speaking, $Cov(Z, Q) \neq 0$ and $Cov(Z, \epsilon_i) = 0$.

Linearity is assumed in all functional forms as a first and valid local approximation. Consequences are, however, well-kept in mind considering the theory insights above-mentioned. Also, nonlinearities coming from Equation (3) are very likely because electoral rules and constitutional regimes interact with many other variables (like demographics) that makes the experience of the average country, across sets of de-jure political rules, differ in important ways. The exploration of more advanced methods is left for the research extensions.[16]

3.1 Ordinary Least Square Estimates

To proceed with the econometric analysis, ordinary least square (OLS) estimations are presented. They serve as statistical summaries to explore the relationships expressed in Equations (1) to (3) and cannot be interpreted as evidence of a causal relationship since the rule of law and EV are endogenous. Endogeneity introduces a bias in the OLS regression, being either positive (omitted variables) or negative (attenuation due to measurement error). Instrumenting, discussed in the next section, will reveal the nature of the bias.

Tables 3a and 3b report the OLS estimation of Equation (1), where the dependent variables are firm and labor informality respectively. The rule of law was rescaled to range between 0 and 1. Errors are robust because of country heterogeneity. Controls are the dummy *old*, that takes the value of 1 if the democracy was born before 1978 and 0 otherwise, and dummies by world regions. A negative relationship between the rule of law and informality is expected as a stronger rule of law implies lower informality, which is confirmed in all columns (recall Graph 5). The dummy *old* represents a premium in institutional stability enjoyed by democracies established before 1978, therefore the older the democracy, the lower its informality. This coefficient is consistently negative.

The classification of world regions follows Schneider's (2008); the omitted groups are Eastern Europe and the three African countries in the sample. As Latin America has the

coordination of political agents.

[16] Persson et al. (2001) and Persson & Tabellini (2003) study the effect of electoral rules on corruption. They use traditional regression analysis and non-parametric estimates (propensity score methods) to allow for selection bias and possible nonlinearities.

highest level of informality and the OECD countries the lowest (Table 1), positive and negative signs for these dummies are respectively expected and confirmed. No prior sign was held for Asia, which has an informal economy close to the world average (around 30 percent). Results show a negative sign for the dummy *Asia* .

Table 3a

OLS Estimates. Dependent Variable: Firm Informality

	(1)	(2)	(3)	(4)	(5)	(6)
Rule of Law	-35.31***	-29.60***	-23.67***	-23.32***	-26.99***	-16.73*
	(3.551)	(3.596)	(6.564)	(6.415)	(8.007)	(9.823)
Latin America			1.299	1.942		2.731
			(3.792)	(3.914)		(4.225)
Asia			-2.522	-0.798		-2.821
			(3.504)	(3.926)		(3.705)
OECD			-9.041**	-5.114		-7.020
			(3.715)	(4.257)		(4.380)
Old		-6.411**		-4.730		
		(2.442)		(2.846)		
Log of GDP pc					-2.425	-2.355
					(2.158)	(2.283)
Constant	49.78***	49.81***	46.62***	46.89***	66.35***	62.27***
	(2.784)	(2.631)	(3.344)	(3.271)	(15.33)	(15.43)
Observations	62	62	62	62	61	61
R-squared	0.598	0.632	0.629	0.642	0.610	0.637

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The excluded dummies for regions are Eastern Europe (9 countries) and Africa (3 countries). For data sources see Table 2.

The same relationships should be found for labor informality. Comparing Columns (1) to (4) in Table 3a with those in Table 3b, indicate that labor informality is more strongly correlated with the rule of law than firm informality, i.e. larger coefficients and R^2. Regional dummies are not significant in explaining firm informality in contrast with labor informality. However, the dummy for OECD countries is positive in all combinations, perhaps capturing an income effect whereby skilled workers with high income become own-account workers. In both cases, once the logarithm of the GDP per capita is included in Columns (5) and (6), the rule of law loses explanatory power reflecting collinearity . Labor informality is more strongly associated with income than firm informality which makes sense given that the former responds quicker to the business cycle than the latter.

Table 3b

OLS Estimates. Dependent Variable: Labor Informality

	(1)	(2)	(3)	(4)	(5)	(6)
Rule of Law	-38.40***	-37.02***	-39.51***	-37.46***	-23.93***	-16.35**
	(3.378)	(4.679)	(6.736)	(5.954)	(7.019)	(6.669)
Latin America			10.54***	11.42***		14.40***
			(3.032)	(3.007)		(2.993)
Asia			16.81***	17.83***		18.20***
			(4.167)	(4.018)		(4.284)
OECD			10.95***	14.30***		19.81***
			(3.239)	(4.154)		(3.436)
Old		-1.455		-5.351*		
		(3.176)		(3.162)		
Log of GDP pc					-4.626**	-9.442***
					(2.179)	(2.088)
Constant	44.97***	44.93***	36.01***	35.94***	77.81***	102.1***
	(2.681)	(2.666)	(3.781)	(3.428)	(16.48)	(15.38)
Observations	60	60	60	60	59	59
R-squared	0.646	0.648	0.759	0.776	0.676	0.847

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The excluded dummies for regions are Eastern Europe (9 countries) and Africa (3 countries). For data sources see Table 2.

Table 3c introduces the OLS estimation of Equation (2) in which the rule of law is the dependent variable and EV is the explanatory variable of interest. The portfolio theory of electoral investment illustrated that electoral risk (EV) rises as income moves from very low to middle levels, from where it decreases as the economy becomes richer. A linear approximation based on low-middle income and affluent democracies points out a negative relationship between EV and the rule of law whose graph is very similar to Graph 2 (EV against log of income per capita). Columns (1) to (6) in Table 3c show negative and significant coefficients for EV. Control variables are the same as before but signs are the opposite: the dummy old is expected to contribute positively to the rule of law, while dummies for Latin America and the OECD must have a respectively negative and positive affect upon the rule of law given their bad and good scores (Table 2).

Table 3c

OLS Estimates. Dependent Variable: Rule of Law

	(1)	(2)	(3)	(4)	(5)	(6)
EV	-0.0124***	-0.00850***	-0.00676***	-0.00707***	-0.00249	-0.00364**
	(0.00205)	(0.00304)	(0.00172)	(0.00203)	(0.00213)	(0.00155)
Latin America			-0.308***	-0.309***		-0.271***
			(0.0571)	(0.0573)		(0.0512)
Asia			-0.117	-0.113		-0.0556
			(0.0767)	(0.0747)		(0.0504)
OECD			0.223***	0.235***		0.0367
			(0.0703)	(0.0722)		(0.0649)
Old		0.188**		-0.0261		
		(0.0930)		(0.0659)		
Log of GDP pc					0.189***	0.130***
					(0.0234)	(0.0227)
Constant	0.858***	0.665***	0.757***	0.774***	-1.043***	-0.413*
	(0.0690)	(0.122)	(0.0824)	(0.101)	(0.249)	(0.215)
Observations	64	64	64	64	63	63
R-squared	0.347	0.405	0.759	0.760	0.713	0.847

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The excluded dummies for regions are Eastern Europe (9 countries) and Africa (3 countries). For data sources see Table 1 and 2.

Finally, Table 3d shows the OLS results of Equation (3) where *de-jure* political rules are the explanatory variables for EV. Measures of these rules are taken from several sources: measures from Persson & Tabellini (2003) are mean values over the period 1990-1998. Those from the Database of Political Institutions (DPI) (World Bank, 2009) are mean values over 1990-2009 except for the constitutional regime, electoral formula, proportional rule, and closed-list which correspond to the 2000 value. Data on ballot structure from Seddon et al. (2002) are means over 1990-2001, except the feature of bicameralism that is the median over this period.

A complete list, definitions and sources as well as descriptive statistics can be found in Tables A5, A6a and A6b. Discussion on the expected relationship between these rules and EV is developed in the next section. The main concern here is to empirically identify controls and combinations of *de-jure* rules that explain EV the best. Table 3d shows those regressions in which electoral rules were significant indicating a strong correlation with EV (these regressions are reported in Table A7).

Ethnic fractionalization and the age of democracy performed well as controls. The first control is a positive determinant of EV (Madrid, 2005) since the more fragmented a society, the stronger the demand for political representation. The second control conveys the fact that old democracies have more stable party systems than young ones, hence their effect on EV is expected to be negative. Table 3d shows that signs of ethnic fractionalization and the age of democracy are positive and negative, respectively, as expected. Following Persson & Tabellini (2003), these controls hold constant historical determinants of constitutional choices so as to alleviate the *selection bias* of *de-jure* political rules (i.e. countries' self-selection of these rules on the basis of cultural traits and historical experience).

Similar results were found when controlling additionally for the constitutional regime and the electoral rule (majoritarian or proportional rule) in order to identify interactions among main rules. No more than three rules were jointly taken for the sake of parsimony and to avoid collinearity given by the systematic relationship between electoral rules (i.e. majoritarian elections tend to be held in small districts). The effective number of parties, a

traditional explanatory variable in the political science literature, is not included in alternative specifications of Equation (3); to the extent that ENP is a political outcome, the effect of *de-jure* rules vanished when this variable replaces ethnic fractionalization (i.e. electoral rules lose significance).

Table 3d

OLS Estimates. Dependent Variable: Electoral Volatility

	(1)	(2)	(3)	(4)	(5)	(6)
Ethnic Fractionalization	20.16**	17.42**	21.96***	24.02***	28.39***	19.16**
	(7.957)	(7.807)	(7.875)	(7.811)	(8.733)	(7.469)
Age of the democracy	-0.157***	-0.137***	-0.141***	-0.144***	-0.149***	-0.115***
	(0.0246)	(0.0244)	(0.0264)	(0.0251)	(0.0353)	(0.0273)
Parliamentary System		-3.220*				
		(1.640)				
Single-district member			-7.908**			
			(3.835)			
Proportional rule				8.590***		
				(3.030)		
Closed-list					7.203**	
					(3.048)	
Reform						3.796***
						(0.824)
Constant	27.32***	30.72***	28.38***	18.61***	20.77***	19.64***
	(3.596)	(4.290)	(3.663)	(4.590)	(4.519)	(3.447)
Observations	64	64	64	64	50	64
R-squared	0.368	0.407	0.403	0.422	0.441	0.500

Notes: Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1. The excluded dummies for regions are Eastern Europe and Africa (9 and 3 countries respectively). Parliamentary system corresponds to "system", proportional representation to "pr" and closed-list to "cl". Mean values over the period 1990-2009, except for "pr" which corresponds to the value in 2000. Single-district member is the inverse of the weighted mean of district magnitude, coded as "sdm1". Source: Database of Political Institutions (World Bank, 2009). The variable "reform" is a dummy variable, calculated by the author, which identifies changes in several electoral rules from 1990 until 2008. For details see Table A5.

A dummy called *reform* identifies changes in electoral rules that have taken place in several democracies since the 1990s. According to this dummy, only 13 percent of countries in the sample engaged in no reforms, 45 percent undertook one or two reforms and 25 percent made between three and five reforms. Understandably, these reforms increase EV insofar as they modify parties' calculations and bring about party turnover. Column (6) in Table 3d shows that *reform* contributes positively to EV.[17]

It is no coincidence that EV is relatively high in the most reformist countries: Bolivia, Guatemala, Italy, South Korea, Mongolia, New Zealand, Nicaragua, the Philippines, and Thailand. Suggestive of these relationships is the fact that the correlation between EV and the rule of law, and between EV and firm informality for the reformist countries rise to -0.91 and 0.82 respectively in contrast to -0.59 and 0.56, which are the figures for the entire sample.

Causality between reforms and EV is a specious matter because in some cases, reforms caused a political opening (e.g. Nicaragua, New Zealand). In some other cases, EV was high before the changes in *de-jure* political institutions, revealing long-standing corruption and/or unstable *de-jure* political rules (e.g. the Philippines, Peru). In consequence, *reform*

[17]From 1990 to 2009, 41 out of 64 countries reformed their district magnitudes and nine changed the electoral rule of the lower chamber. Over the period 1990-2001, 12 countries modified their threshold values, two switched from bicameralism to unicameralism, 10 changed their ballot structure, 11 the way of pooling votes, and 13 the number of votes cast by voters. Seven dummy variables register if there were changes in the rules during this period (it does not register how many times the rule changed). The dummy *reform* adds up all types of reforms so that it takes values between 0 and 7 (see Table A8).

is used as a control variable that identifies the direct effect of instability in electoral rules over the rule of law due to a political opening and/or intense corruption.

That corruption or restricted political competition motivates reforms ultimately refers to the two-way causation between machine politics and institutional quality (Diagram 1). The fundamental point is to determine the ability of such reforms to enhance institutional quality and therefore reduce informality. A time series analysis would provide definite evidence about the character of *strategic moves* these reforms could have, but for the time being the cross-country analysis offers us an initial approximation.

3.2 *De-jure* Political Rules and Electoral Volatility

A characterization of electoral rules and their relationship with EV will allow it to identify those rules with potentiality to perform as good instruments of our endogenous variable, that is, the rule of law. These rules comprise the following dimensions (Carey & Shugart, 1995; Persson & Tabellini, 2003):

1. Forms of Government: type of constitutional regime, i.e. presidential, semi-parliamentary and parliamentary.
2. District Magnitude: number of legislators acquiring a seat in a typical voting district. From single-member districts to a single, all-encompassing district.
3. Electoral Formula: how votes are translated into seats, i.e. plurality vs. proportional representation.
4. Ballot Structure: how citizens cast their vote, choosing among different individual candidates or party lists. It has three aspects: (a) ballot: the degree of control that party leaders have over access to their party's label; (b) pool: whether votes cast for one candidate contributes to her party's vote share; and (c) votes: single or multiple votes for candidates or parties.

Based on seminal ideas introduced by Cox (1990) on centrifugal and centripetal forces in electoral systems, they are classified according to the incentives they provide as to party entry, and inter-party and intra-party competition. Centrifugal incentives bring about fragmentation in political agency, as well as encourage party entry, ideological dispersion, candidate-centered politics, and high intra-party competition. In contrast, centripetal incentives consolidate political agency into fewer parties, as well as encourages party-centered politics and less intra-party competition as the result of stable coalitional politics. Centrifugal forces increase EV, whereas centripetal forces diminish it. This is another way to state the well-known intuition that EV increases with the ENP. The underlying premise is that few permanent parties induce stable political competition.

Table 4a identifies the specific *de-jure* rules associated with centripetal forces along the above-listed dimensions and some implications in regard to targeted redistribution and rent-extraction. Thresholds over vote share required to participate in elections as well as the feature of bicameralism are included in the table. Centripetal effects amount to a partial correlation between the rule and EV as it is assumed that the other electoral rules remain constant.

Table 4a
Centripetal *De-Jure* Political Rules

De-jure Political Rules	Centripetal forces (reduces EV)	Arguments	Targeted Redistribution (TR)/ Rent-Extraction(RE)
Constitutional regime(a)	Parliamentary	*Separation of powers*: Greater concentration of power eases collusion. *Confidence requirement*: support of a majority in the legislature encourages coalitions.	Higher TR. Coalitional politics increases particularistic demands.
District Magnitude(b)	Small districts	High entry barriers. Few seats per district lower the probability of winning bringing few parties in the race.	Higher TR. Biased toward targeted programs. If low (high) accountability, then high (low) RE.
Electoral Formula(a)(b)	Majoritarian	*Duverger's Law*: plurality rule election system tends to favour a two-party system.	Lower TR and RE. More provision of public goods; tighter political competition.
Ballot/party list (c)	Party list	Party discipline fosters party unity and less personality-based leadership.	Ambiguous. If high party discipline, then lower intra-party competition and lower TR. If high aaccountability, then lower RE.
Ballot/pool(c)	Pooling across whole party	A candidate's fortunes depend on the ability of her entire party to attract votes.	
Ballot/votes (c)	Single vote for one party	Party reputation overrides personal reputation of candidates.	
Threshold(a)	Large	High entry barriers.	Lower TR (fewer parties). Looser political competition, then high RE.
Bicameralism (a)	No bicameralism	Decreases the probability of surplus coalitions (a lower majority is required to form government or pass legislation).	

(a) Persson&Tabellini (2003); (b) Cox(1990); (c) Carey&Shugart (1995)

A difficulty in making empirical inferences from these effects is that their direction can change once the rule interacts with other rules or when different assumptions on the distribution of policy preferences are considered. For example, high district magnitude is deemed to encourage party fragmentation, however Carey & Shugart (1995) sustain that high district magnitude combined with a closed-list reduces the value of politicians' personal reputation which in turn creates centripetal forces in the party system. Morelli (2004) establishes that majority rule reduces the number of parties, compared to proportional representation, as long as the distribution of policy preferences is uniform within districts and not too dissimilar across districts. Lizzeri & Persico (2001) find that proportional rule is associated with less targeted redistribution when voters have strong preferences for the public good.

In Table 4a the relationship between a centripetal ballot structure (party list, pooling and single party vote) and targeted redistribution is deemed ambiguous. These rules are linked to less political personalism and stronger party discipline (lower intra-party competition), hence less targeted redistribution. This means that choosing individual candidates over party candidates goes against party discipline and encourages targeted redistribution. However, if party lists are unable to discipline individual politicians, the free rider problem increases inter-party competition, reduces accountability and raises corruption (Persson et al., 2003). Consistently with these two possibilities, Lyne (2008) distinguishes between candidate-centered (no party-list) and party-centered clientelism as dominant targeted redistribution is feasible in both alternatives.

For example, Seddon et al. (2002) find that Latin America and Eastern Europe were the most party-centered regions in the world around 1997, while Kitschelt (2010) reports that parties in these countries exhibited relatively high levels of clientelistic efforts in 2008-2009. This evidence support Persson et al.'s view (2003), that is, a party-based ballot structure is associated with less accountability and more particularistic redistribution.

These theoretical insights in Table 4a are confirmed by descriptive statistics in Table 4b, in which majoritarian versus proportional representation systems are compared. Table 4b presents mean values of EV, the rule of law, constitutional regime (where 0 represents presidential regime, 1 semi-parliamentary and 2 parliamentary), district magnitude (average number of seats per district), the proportion of lower-house legislators elected through party-list, and the index of particularism based on the ballot structure (large numbers indicate high value of personal reputation).

Table 4b

Majoritarian vs Proportional Representation:
Mean values and standard deviation of main variables

System	EV	Index of the Rule of Law	Constitutional System	District Magnitude	Party List	Index of Particularism	N*
Majoritarian	19.4	0.6	1.6	3.4	0.0	1.4	14
	10.8	*0.3*	*0.9*	*5.11*	*0.0*	*0.5*	
Proportional Representation	27.7	0.5	1.0	18.4	0.8	0.6	50
	15.4	*0.3*	*1.0*	*36.29*	*0.3*	*0.5*	
Total	25.9	0.5	1.1	15.12	0.7	0.8	64
	14.9	*0.3*	*1.0*	*32.69*	*0.4*	*0.6*	

Notes: Mean value and standard deviation below in smaller and italic numbers. Constitutional regime is a dummy variable that takes the following values: 0 for Presidential, 1 for assembly-elected president and 2 for parliamentary. District magnitude is the weighted average of the number of representatives elected in each constituency size for lower house. These two variables are "system" and "mdmh" from DPI (World Bank, 2009). Party list is the proportion of total seats elected through party list system in the lower house, so it takes values between 0 and 1 (Persson & Tabellini, 2003). The index of particularism is the average of three dimensions of the ballot structure (ballot, pool and vote), and takes values between 0 and 2, where small numbers indicate lower values of personal reputation (and high values of party reputation). Calculations based on Seddon et al. (2002). *The number of observations for party list and the index of particularism is 59 and 61 respectively.

Majoritarian systems exhibit lower EV and a slightly higher rule of law than proportional electoral systems, and tend to be parliamentary. Majoritarian systems also have lower district magnitude, no use of party-lists and a candidate-based ballot structure (large value of the index of particularism).[18]

To sum up, Table 4c shows the expected (or theoretical) partial correlation just discussed and the empirical partial correlation between alternative measures of *de-jure* political rules and EV. The empirical correlation corresponds to the coefficient sign of the rule obtained by the OLS regression of Equation (3), in which controls are ethnic fractionalization and the age of democracy (see Table A7).

[18]Majoritarian electoral systems typically have small district magnitudes and a large fraction of seats elected through candidate-based ballots (e.g. the British first-past-the-post system). As the electoral system moves toward proportional rule, district magnitude increases and candidates are elected through party-lists. Persson & Tabellini (2003, p. 102) point out the non-random selection of constitutions and electoral rules: most Anglo-Saxon countries and former UK colonies have majoritarian electoral systems, and most of Europe and South America have proportional ones. Also, most OECD countries are predominantly parliamentary, whereas many countries in Latin America are presidential regimes.

Table 4c
De-Jure Political Rules and Partial Correlation with EV

De-jure Political Rules	Code	Centripetal force values (reduces EV)	Expected partial corr. with EV	Empirical partial corr. with EV
Constitutional regime	pres	=0 (min)	(+)	(+)
	system	=2 (max)	(-)	(-)*
District Magnitude	mdmh	→1 (min)	(+)	(+)
	dm	→1 (min)	(+)	(+)
	magn1	→1 (max)	(-)	(-)
	sdm1	→1 (max)	(-)	(-)*
	propn	→0 (min)	(+)	(+)
Electoral Formula	housesys	=1 (max)	(-)	(-)
	maj	=1 (max)	(-)	(-)
	pr	=0 (min)	(+)	(+)*
	pind	=1 (max)	(-)	(-)
	pindo	=1 (max)	(-)	(-)
Ballot structure: list	list	→∞+ (max)	(-)	(-)
	list1	→1 (max)	(-)	(+)
	cl	=1 (max)	(-)	(+)*
Ballot structure: ballot, vote and pool	ballot	=0 (min)	(+)	(-)
	Pool	=0 (min)	(+)	(-)
	Vote	=0 (min)	(+)	(-)
	Indexp(a)	=0 (min)	(+)	(-)
Threshold	threshold	→∞+ (max)	(-)	(+)
Bicameralism	bicameral	=0 (min)	(+)	(-)
Reforms	reform	=0 (min)	(+)	(+)*

*Significant at 5% or 1%. Code definitions are in Table A5. (a) Index of particularism designed by Carey&Shugart (1995) as the average of ballot, vote and pool.

Red signs in the last column indicate differences between the empirical and the expected correlation. Thus, high party control over access to and position on the ballot, pooling of votes as well as a larger threshold, increase instead of decrease EV. Interactions with other characteristics of the party system could be at work, e.g. party-lists have a very marginal effect in disciplining politicians if independent candidates are more successful than candidates constrained by a party. Hereafter, rules with a positive sign in the last column of Table 4c are considered centrifugal and those with a negative sign centripetal.

3.3 Instrument Selection

De-jure political rules as potential instruments are explored individually and jointly. In the first approach, rules with significant coefficients in the OLS regressions of Equation (3) qualify as IV candidates. In the second approach, the Principal Component Analysis (PCA) aggregates several characteristics of the electoral system into one variable so that joint variation can be captured.

The last column of Table 4c identifies those rules with significant coefficients which is the set $Z_1 = \{system, sdm, pr, cl\}$. In this set, proportional rule (pr) and closed-lists (cl) are centrifugal rules (negative empirical correlation with EV), while parliamentary regime ($system$) and the index of single-district members (sdm) are centripetal. The index of single-district members is the weighted mean of districts per seats, i.e. the inverse of the mean district magnitude. It takes values between 0 and 1, so that numbers approaching 1 signal higher incidence of single-district members.

Combinations of electoral rules are aggregated into one variable that captures most of the joint variance by the PCA. This is a statistical technique for data reduction commonly used in multivariate analysis based on the Eigen decomposition of the correlation matrix of the variables. The resulting variables are referred to as principal components, in which the first principal component is a usual substitute of the original variables in the subsequent analysis. A reduction is successful if the first component explains at least 70 percent of the variance and the Kaiser-Meyer-Olkin (KMO) criterion for sample adequacy is higher or equal to 0.7.[19]

Tables A9a and A9b show PCA results of rules that are grouped according to their centrifugal or centripetal effect (empirical partial correlation of Table 4b). Combinations of centripetal rules performed much better than those of centrifugal rules. The set $PC = \{system, mag, housesys/pind, indexp\}$ was the most promising. Yet, its first component just explains 66 percent of the variance and has a KMO criterion of 0.71. Combinations of electoral rules according to partial theoretical correlations did not fare well; neither did those of the PCA using Z_1. Perhaps the reduction is more effective, if not meaningful in this application, when all components contribute to total variability in the same direction.

By leaving out *system*, due to its low squared multiple correlation, the PCA estimates gain reliability: the sets $pc1 = \{magn1, housesys, indexp\}$ and $pc2 = \{magn1, pind, indexp\}$ provide first principal components explaining over 83 percent of the variance and showing a KMO criterion of about 0.7. Principal component 1 and 2, *pc1* and *pc2*, combine the centripetal forces stemming from small district magnitude, majority rule and candidate-centered ballot structure. These two variables are centripetal as they have a negative correlation with EV equal to -0.17 and -0.18 respectively. Unfortunately, some countries drop out of the sample because there were not enough data to calculate the principal components.[20]

3.4 Instrumental Variable Estimates

All elements have been laid out to finally explore econometrically the causation that starts out from *de-jure* political rules to EV, and from here to the rule of law and hence informality. Electoral volatility is the linkage variable relating core political institutions to the political structure (party system), whereby an aggregate political outcome such as institutional quality can be more accurately explained.

In the two-stage least square regressions (2SLS), instruments of institutional quality are elements of Z_1 and the principal components 1 and 2 (*pc1* and *pc2*). Because all these measures are weak instruments when used individually, combinations with main rules like parliamentary regime and proportional representation, as well as control variables of Equation (3), that is ethnic fractionalization and the age of democracy, were estimated. These two variables are seen as representing historical factors (*de-facto* institutions). Initially, controls for Equation (1) are those of Columns (1) to (3) in Tables 3a and 3b, i.e. no controls, *old* and regional dummies respectively.

All estimates use robust errors to manage heteroskedasticity and their selections rests upon three criteria: (1) rejection of the endogeneity test (robust Durbin test) at 95 percent of confidence level; (2) jointly valid instruments (Sargan test for overidentification) given by a p-value higher than 50 percent; and (3) a minimum Eigen statistic, which assesses the weakness of instruments, higher than the critical values set at 10 or 15 percent of error.[21]

[19] The KMO criterion takes values between 0 and 1, with small values indicating that overall the variables have too little in common to warrant a PCA (StataCorp, 2009a; Cuadras, 2011).

[20] Panama, Czech Republic, Taiwan, and Estonia do not have figures of *pc1* and *pc2*. In addition, Benin, Macedonia and Mongolia cannot be calculated for *pc2*. Thus, the samples are $N_{pc1} = 60$ and $N_{pc2} = 57$. Fortunately, differences in summary statistics of EV, rule of law, and firm and labor informality for the 64 country sample and the 57 country sample given by *pc2* are minor.

[21] The null hypothesis in the Durbin test is H_0*: instruments are exogenous*, and for the Sargan test it is H_0*: instruments are jointly-valid*. Both statistics follow a chi-square distribution. The Sargan test can be

Columns (1) to (5) in Table 5a report selected estimates of a second stage with no controls and a first stage where ethnic fractionalization and the age of democracy are the base instruments. Columns (2) to (5) add to the base instruments, respectively, single-district member, proportional rule and the principal components 1 and 2. The IV coefficient for the rule of law is higher than the OLS coefficient suggesting a negative bias in the OLS regression. Thus, by instrumenting the rule of law, the measurement error is reduced. Given the inverse relationship between EV and the rule of law, centripetal variables such as the age of democracy, single-district member and the two principal components are expected to increase the rule of law, and vice versa, i.e. centrifugal variables such as ethnic fractionalization and proportional representation diminish the rule of law.

Table 5a

IV estimates of Firm Informality
(fractionalization and age of democracy as base instruments)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Two-Stage Least Squares							
Rule of law	-47.74***	-47.60***	-47.96***	-44.48***	-45.72***	-47.10***	-41.74***
	(5.263)	(5.335)	(5.254)	(4.776)	(5.148)	(6.004)	(5.115)
Reform						0.235	1.554*
						(1.031)	(0.842)
R-squared	0.524	0.525	0.521	0.584	0.595	0.532	0.660
Panel B: First Stage for Rule of Law							
Ethnic fractionalization	-0.557***	-0.548***	-0.564***	-0.574***	-0.598***	-0.528***	-0.587***
	(0.122)	(0.125)	(0.125)	(0.125)	(0.133)	(0.124)	(0.133)
Age of democracy	0.00372***	0.00383***	0.00369***	0.00398***	0.00398***	0.00357***	0.00384***
	(0.000626)	(0.000668)	(0.000651)	(0.000682)	(0.000714)	(0.000732)	(0.000807)
Single-district member		-0.0542				-0.0830	
		(0.0783)				(0.0785)	
Proportional rule			-0.0219				
			(0.0756)				
Principal component 1				0.00217			
				(0.0202)			
Principal component 2					0.00538		0.00541
					(0.0210)		(0.0215)
Reform						-0.0286	-0.0115
						(0.0189)	(0.0218)
R-squared	0.511	0.514	0.512	0.553	0.540	0.530	0.543
Postestimation Tests							
Durbin Robust Score	9.66	9.23	10.02	8.09	8.21	8.67	7.51
p-value Robust Score	0.00	0.00	0.00	0.00	0.00	0.00	0.01
Sargan Chi-Square	0.33	0.43	1.42	0.96	0.27	0.43	0.51
p-value Sargan	0.56	0.81	0.49	0.62	0.87	0.81	0.78
Minimum Eigen Value	30.82	20.49	20.25	22.26	19.98	16.62	15.49
Critical value eigv 10%	19.93	22.30	22.30	22.30	22.30	22.30	22.30
Critical value eigv 15%	11.59	12.83	12.83	12.83	12.83	12.83	12.83
Panel C: Ordinary Least Squares							
Rule of law	-35.31***	-35.31***	-35.31***	-34.64***	-35.07***	-35.31***	-31.37***
	(3.551)	(3.551)	(3.551)	(3.389)	(3.556)	(3.551)	(3.303)
Reform						49.78***	2.318**
						(2.784)	(0.870)
Observations	62	62	62	58	55	62	55
R-squared	0.598	0.598	0.598	0.636	0.656	0.598	0.710

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Firm informality, Schneider (2008); the rule of law is rescaled to range between 0 and 1 (Kauffman et al. 2010). Reform is a dummy that takes values between 0 and 7, calculated by the author. Ethnic fractionalization is from Alesina et al. (2003), age of democracy and single-district member from (Persson& Tabellini, 2003). Proportional rule comes from DPI (World Bank, 2009). Principal components are aggregations of some electoral rules by PCA. Thus, pc1={magn1, housesys, indexp} and pc2={magn1, pind, indexp}. They combine the centripetal forces stemming from small district magnitude, majority rule and candidate-centered ballot structure.

also seen as identifying that the structural equation is incorrectly specified. The minimum Eigen value stems from Cragg-Donald Wald F statistic that verifies orthogonality conditions where H_0*: instruments are weak*. Critical values assume that the errors are normal, independent and identically distributed and are set out by the maximum rejection rates of a Wald test at the 5 percent level. (Wooldrige, 2001; StataCorp, 2009b).

The base instruments, that is our *de-facto* institutions, are individually significant, in contrast with *de-jure* rules. Nonetheless, electoral rules are jointly significant especially in Column (2) and (5). Also, the sign of single-district member in Column (2) is negative instead of positive as anticipated. This suggests that once electorate heterogeneity and the maturity of democracy are taken into account, small districts have a negative impact on the rule of law.

Columns (5) and (6) in Table 5a reports the best regressions in which the dummy *reform* performs as a control variable. As was explained, *reform* aims to identify exceptional instability in *de-jure* political rules. Column (6) indicates that *reform* affects firm informality in a positive and significant way and that the principal component 2 is the jointly-valid electoral rule with a positive sign as predicted.

Parliamentary regime, proportional rule and single-district member were individually added to the base instruments of specifications in Table 5a, in order to observe interactions with these main electoral rules. Table 5b reports the selected estimates where parliamentary regime has a positive effect on the rule of law and is individually significant in Columns (1) and (6). Also, notice that single-district member stays negative, and that the signs of the principal components are negative when taken together with proportional rule, but positive when grouped with single-district member. The behavior of the coefficients of the principal components points out that inference based on these aggregated variables is less reliable.

Table 5b

IV estimates of Firm Informality

(fractionalization, age of democracy and electoral rules as base instruments)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)
Panel A: Two-Stage Least Squares							
Rule of law	-44.37***	-48.25***	-44.63***	-45.52***	-44.17***	-44.91***	-43.35***
	(5.097)	(5.422)	(4.695)	(5.074)	(4.734)	(5.091)	(5.734)
Reform							0.504
							(1.028)
R-squared	0.558	0.518	0.583	0.597	0.588	0.604	0.570
Panel B: First Stage for Rule of Law							
Ethnic fractionalization	-0.408***	-0.567***	-0.596***	-0.622***	-0.565***	-0.586***	-0.398***
	(0.117)	(0.125)	(0.131)	(0.138)	(0.128)	(0.136)	(0.120)
Age of democracy	0.00311***	0.00381***	0.00397***	0.00394***	0.00408***	0.00408***	0.00295***
	(0.000553)	(0.000677)	(0.000699)	(0.000738)	(0.000696)	(0.000711)	(0.000614)
Single-district member	-0.0997	-0.107			-0.125	-0.172	-0.118
	(0.0762)	(0.0766)			(0.127)	(0.144)	(0.0750)
Parliamentary regime	0.128***						0.125***
	(0.0291)						(0.0301)
Proportional rule		-0.0798	-0.0649	-0.0785			
		(0.0726)	(0.0937)	(0.115)			
Principal component 1			-0.00921		0.0237		
			(0.0251)		(0.0298)		
Principal component 2				-0.00772		0.0369	
				(0.0265)		(0.0345)	
Reform							-0.0197
							(0.0188)
R-squared	0.647	0.521	0.556	0.544	0.560	0.553	0.654
Postestimation Tests							
Durbin Robust Score	7.68	9.67	8.62	8.24	8.34	7.93	6.52
p-value Robust Score	0.01	0.00	0.00	0.00	0.00	0.00	0.01
Sargan Chi-Square	2.22	1.56	1.11	0.46	1.26	1.43	2.20
p-value Sargan	0.53	0.67	0.77	0.93	0.74	0.70	0.53
Minimum Eigen Value	26.08	15.48	16.62	14.94	16.89	15.45	21.65
Critical value eigv 10%	24.58	24.58	24.58	24.58	24.58	24.58	24.58
Critical value eigv 15%	13.96	13.96	13.96	13.96	13.96	13.96	13.96
Panel C: Ordinary Least Squares							
Rule of law	-35.31***	-35.31***	-34.64***	-35.07***	-34.64***	-35.07***	-33.27***
	(3.551)	(3.551)	(3.389)	(3.556)	(3.389)	(3.556)	(3.530)
Reform							1.225
							(1.005)
Observations	62	62	58	55	58	55	62
R-squared	0.598	0.598	0.636	0.656	0.636	0.656	0.613

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. Firm informality, Schneider (2008); the rule of law is rescaled to range between 0 and 1 (Kauffman et al. 2010). Reform is a dummy that takes values between 0 and 7, calculated by the author. Ethnic fractionalization is from Alesina et al. (2003), age of democracy and single-district member from (Persson& Tabellini, 2003). Proportional rule comes from DPI (World Bank, 2009). Principal components are aggregations of some electoral rules by PCA. Thus, pc1={magn1, housesys, indexp} and pc2={magn1, pind, indexp}. They combine the centripetal forces stemming from small district magnitude, majority rule and candidate-centered ballot structure.

Estimates controlling for *old* performed poorly in terms of joint validity of the instruments. This control takes a negative sign as expected but switches the sign of the principal components from positive to negative. Regressions using regional dummies also perform badly and the coefficient of the rule of law becomes unstable. Misspecification could be due to the fact that the rule of law already includes regional effects, that is, it clearly behaves in a different way depending on the region (see Table 2). Hence, regional dummies are included as base instruments of the rule of law to account for historical determinants (e.g. colonial origin). Table 6a reports estimates that conform to the criteria upon instrument performance.

Table 6a

IV estimates of Firm Informality (regional dummies as base instruments)				
Panel A: Two-Stage Least Squares				
	(1)	(2)	(3)	(4)
Rule of law	-40.09***	-40.09***	-40.09***	-40.19***
	(4.261)	(4.262)	(4.267)	(4.273)
R-squared	0.587	0.587	0.587	0.587
Panel B: First Stage for Rule of Law				
Asia	-0.0134	-0.0117	-0.0120	-0.0159
	(0.0833)	(0.0868)	(0.0820)	(0.0845)
Latin America	-0.221***	-0.215**	-0.221***	-0.220***
	(0.0767)	(0.0915)	(0.0770)	(0.0789)
OECD	0.421***	0.418***	0.422***	0.421***
	(0.0659)	(0.0641)	(0.0668)	(0.0666)
Parliamentary regime		0.00465		
		(0.0345)		
Single-district member			-0.00579	
			(0.0527)	
Proportional rule				-0.0138
				(0.0713)
R-squared	0.709	0.709	0.709	0.709
Postestimation Tests				
Durbin Robust Score	4.48	4.48	4.44	4.57
p-value Robust Score	0.03	0.03	0.04	0.03
Sargan Chi-Square	0.62	0.62	0.65	1.74
p-value Sargan	0.74	0.89	0.88	0.63
Minimum Eigen Value	47.01	34.66	34.66	34.70
Critical value eigv 10%	22.30	24.58	24.58	24.58
Critical value eigv 15%	12.83	13.96	13.96	13.96
Panel C: Ordinary Least Squares				
Rule of law	-35.31***	-35.31***	-35.31***	-35.31***
	(3.551)	(3.551)	(3.551)	(3.551)
Observations	62	62	62	62
R-squared	0.598	0.598	0.598	0.598

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1. For sources see Table 5a.

Dummies for Latin America and OECD members have intuitively negative and positive signs and are highly significant in all estimations. In comparison with Table 5a, the coefficient of the rule of law decreases in magnitude but keeps its significance. In Columns (2) and (4), parliamentary regime and proportional rule, respectively, are instruments with correct signs, that is, parliamentary system (centripetal) positively affects the rule of law, while proportional rule (centrifugal) have a negative impact on it. Also, their Sargan statistic is high enough so that the null hypothesis is not rejected indicating jointly-valid instruments. Once more, single-district magnitude takes a negative sign in Column (3).[22]

As before, main electoral rules were added to the base instruments of specifications in Table 6a to capture interactions. Table 6b presents the selected estimates where signs of electoral rules are the same as in the previous tables.

[22]Alternatively, dummies for legal origins from La Porta et al. (1999) were used as instruments instead of the regional dummies, but their coefficients were counter-intuitively negative, weak and reject the Sargan test.

Table 6b

IV estimates of Firm Informality
(regional dummies and electoral rules as base instruments)

Panel A: Two-Stage Least Squares			
	(1)	(2)	(3)
Rule of law	-40.09***	-40.18***	-40.25***
	(4.272)	(4.273)	(4.315)
R-squared	0.587	0.587	0.586
Panel B: First Stage for Rule of Law			
Asia	-0.00937	-0.0147	-0.0125
	(0.0855)	(0.0884)	(0.0838)
Latin America	-0.214**	-0.217**	-0.217***
	(0.0904)	(0.0905)	(0.0810)
OECD	0.418***	0.419***	0.424***
	(0.0653)	(0.0646)	(0.0678)
Parliamentary regime	0.00559	0.00276	
	(0.0337)	(0.0348)	
Single-district member	-0.00807		-0.0238
	(0.0504)		(0.0665)
Proportional rule		-0.0126	-0.0270
		(0.0726)	(0.0901)
R-squared	0.709	0.709	0.709
Postestimation Tests			
Durbin Robust Score	4.43	4.56	4.48
p-value Robust Score	0.04	0.03	0.03
Sargan Chi-Square	0.65	1.80	2.05
p-value Sargan	0.96	0.77	0.73
Minimum Eigen Value	27.26	27.27	27.33
Critical value eigv 10%	26.87	26.87	26.87
Critical value eigv 15%	15.09	15.09	15.09
Panel C: Ordinary Least Squares			
Rule of law	-35.31***	-35.31***	-35.31***
	(3.551)	(3.551)	(3.551)
Observations	62	62	62
R-squared	0.598	0.598	0.598

Notes: Robust standard errors in parentheses *** p<0.01, ** p<0.05, * p<0.1.
For sources see Table 5a.

Estimates when *reform* is included as a control perform poorly since *reform* never reaches individual significance and causes switches in the signs of parliamentary regime and proportional rule. Although, instruments are jointly valid, this control seems not to be meaningful in explaining firm informality. Moreover, its effects are a cautious reminder of the difficulty in establishing the effect of electoral rules that have recently changed in many countries. [23]

Other controls from the pool of variables that the literature on firm informality has pointed out as determinants (i.e. cost of doing business, tax rates) are problematic insofar as they are outcomes closely related to the rule of law. Estimations with these kinds of controls bring about changes in signs of electoral rules and produce jointly-weak instruments.[24]

[23] Persson et al. (2003) examine the relationship between electoral rules and corruption, and carefully identify the episode reforms and their effects by building a panel data with 78 countries that covers the period 1990-1998. They confirm most of their cross-sectional estimates.

[24] The closest candidate to be a meaningful control was the Ease of Doing Business Index (World Bank, 2010). The Ease of Doing Business Index ranks economies from 1 to 183, where 1 indicates the most business-friendly regulations. This index conveys information over differences in regulatory environments

As to labor informality, regressions with the same combinations of electoral rules and controls were run with no satisfactory results as to endogeneity. In all cases, the OLS estimations perform much better than the IV regressions. Suggested by Columns (5) and (6) in Table 3b, the logarithm of the GDP per capita was included in some specifications but the outcomes were equally disappointing. Substantial measurement error in labor informality seems a plausible cause since these figures aggregate own-account workers and family workers who are presumably, but not surely, hired by informal firms. This presumption is troublesome for developed countries where a substantial portion of the own-account workers work in small formal firms. Moreover, as labor informality responds quicker to the business cycle, its analysis needs to consider labor market factors overlooked here (e.g. labor participation).

Altogether, these estimates provide some evidence that, once the explanatory power from ethnic fractionalization and the age of the democracy (or regional dummies) is taken into account, the centrifugal effect from proportional rule and single-district magnitude over the party system diminish the rule of law, which in turn increases informality. This is so because centripetal forces tighten electoral competition whereby electoral risk rises and parties' efforts are driven toward targeted redistribution and, probably, rent-extraction. This evidently hinders institution building and, as a result, lowers the costs of informality by reason of weak enforcement and/or over-taxation due to corruption. Likewise, it was found that the centripetal effect from a parliamentary regime, positively contributes to the rule of law, and thus to lower informality.

The fact that electoral rules reach individual significance only when combined with *de-facto* institutions points out that EV stems from a combination of *de-jure* and *de-facto* institutions. Electoral rules are not sufficient to enhance political competition and constrain politicians.

Despite the fact that the robustness of these results is limited, our findings are remarkably aligned with those presented in three branches of the literature on: (1) the determinants of institutional quality, (2) the causes of informality, and (3) the effect of electoral rules on the quality of government and corruption. A discussion about the theoretical scope and empirical validity of these studies is presented in the next section. This discussion will place the results in perspective and highlight the contribution.

4 Discussion

Well-known papers that empirically investigate the determinants of institutional quality are Mauro (1995), La Porta et al. (1999) and Alesina et al. (2003). These authors establish and judiciously measure a set of exogenous variables that are used as controls to explain corruption and/or the quality of governments in the ensuing literature. This set includes ethnolinguistic fractionalization, origin of the legal system, colonial origins, religious affiliation, among others.

Mauro (1995) studies the relationship between corruption and economic growth in 70 countries by OLS and 2SLS methods. He finds that bureaucratic efficiency causes high investment and growth. Also, that political stability is at least as important a determinant of investment and growth as bureaucratic efficiency. La Porta et al. (1999) examines the determinants of government quality in 152 countries by using the OLS method. They classify theories on causes and institutional performance in three broad categories: economic

with similar rule of law, e.g. in our sample, Germany and Ireland have an index of the rule of law equal to 0.9, but this index is 21 in the former and 8 in the latter. Thus, more regulations in Germany can explain a slightly higher firm informality than in Ireland (16.3 versus 15.6 percent). In the IV estimates with this control, only parliamentary regime stands as a jointly-valid instrument. Yet, its sign goes from negative to positive depending on whether the other instruments were the regional dummies or ethnic fractionalization and the age of democracy.

(institutions emerge when it is efficient), political (institutions are shaped by those in power and meant to transfer resources to themselves) and cultural (society's beliefs set out its institutions). They find support for the political theories and state that although history matters, it is political history that matters the most.

Alesina et al. (2003) revisits La Porta et al. (1999), aiming to improve the robustness of the analysis limited by the sensitivity over measures and specifications as well as endogeneity issues. They build data on 198 countries and apply seemingly unrelated regressions (an OLS generalization) whereby they conclude, among other things, that ethnic and linguistic fractionalization variables are substantial determinants of economic growth, governance and the quality of institutions. Nonetheless, they warn about the difficulties in accurately evaluating the size of these effects, whose ultimate test would come from theory.

Drawing upon these works, empirical studies on informality use corruption and/or the quality of government as explanatory variables. Thus, Friedman et al. (2000), using data on 69 countries and IV methods, find that poor institutions and a large unofficial economy go together. They underscore that the causality runs from weak economic institutions to the size of the shadow economy: over-regulation and corruption induce firms to move into the unofficial economy, that is by being informal, entrepreneurs dodge the grabbing hand.

Nonetheless, Dreher & Schneider (2010) claim that finding sound evidence on the relationship between the shadow economy and corruption requires a larger sample so that they can gather data on 98 countries and apply OLS and IV methods. Also, they split the sample into high and low income levels because, theoretically, corruption and the shadow economy can be either substitutes or complements. These authors provide evidence that corruption and the size of the shadow economy are complements in low-income countries but not in high-income ones.

The last branch of literature related to this work focuses on the influence of electoral rules over corruption. Persson et al. (2003) build a dataset with 80 democracies and apply OLS and weighted least squares (WLS) to the cross-section analysis, as well as panel data methods to incorporate time-series variation. Their theory predictions state that the following rules decrease corruption: larger district magnitude and lower threshold for representation (the barriers-to-entry effect), a larger share of politicians elected on an individual ballot (the career-concern effect) and plurality rule in small districts (the electoral-competition effect). They find that small districts, party-based ballot structure (party-list) and proportional rule raise corruption.

In the same vein of Persson et al. (2003), Kunicova& Rose-Ackerman (2005) establish that proportional representation systems and presidential regimes are more prone to corrupt political rent-seeking. Additionally, they obtained evidence showing that presidential systems are more susceptible to corruption than parliamentary ones due to fixed terms and legislative bargaining patterns. In their view, presidential and proportional systems hinder the ability of voters and opposition parties to monitor corrupt incumbents. Kunicova& Rose-Ackerman (2005) work with a cross-section of 94 democracies, OLS and WLS methods.

All these empirical results point in the same direction of my findings. Likewise, they are subject to the same limitations of cross-section analysis: sensitivity to measures and specification (measurement error, omitted-variable bias), and issues on endogeneity (selection bias). Yet, this analysis pushes the literature a step further because it rests upon a more general conceptual framework that identifies more precisely causation channels. As a consequence, the main contribution of this research is to bring political structure into the picture, here the party system, insofar as it is a key intermediating mechanism between political institutions (*de-facto* and *de-jure*) and social outcomes (political and economic).

In all these works the political structure is a black box that readily disappears when

reduced-form equations are estimated. Naturally, samples in which democratic and autocratic regimes of all sorts are lumped together instead of improving the validity of the results increase their sensitivity. This problem is somewhat alleviated in studies on electoral rules which are confined to democracies. Similarly, an exogenous control like ethnic fractionalization is broadly used in association with political instability and more redistributive tendencies, but its causation mechanism differs according to the political regime (i.e. it could increase coercion at the expense of peaceful redistribution in autocracies or repressed democracies).

Persson & Tabellini (2003) concentrate on direct effects of constitutional rules and leave out indirect effects operating through political outcomes, however, they acknowledge that this is an important omission. According to them, studies on how party structures and types of government shape economic policy do not have coherent theoretical models, and their conclusions are empirically unreliable. Thus, by building an encompassing framework such as *the political exchange space* and the portfolio theory of electoral investment, this research sheds light upon an indirect effect taking place through machine politics, which is the political outcome that conveys information on the stability of the party system. Our sample is made up of democracies of middle to high quality according to the Polity 2 score, seeking comparability in the underlying mechanism.

That is how in this research, ethnic fractionalization negatively contributes to institution building because it makes the electoral contest more risky as the number of electoral contestants is larger. Similarly, presidential regimes, proportional rule and small district magnitude negatively affect the rule of law due to their centrifugal effect on the party system, while a party-centered ballot structure has ambiguous consequences on EV.

Furthermore, this framework is more general because it includes not only information on party structure, with implications on policymaking as will be explained, but also allows the two types of principal-agent relationships between political agents and voters in regard to rent-extraction: the conflicting and collusive. In the first type, political agents and voters have opposite interests. Bribes are pure waste and voters punish corrupt politicians as soon as they are detected. In other words, this refers to the *dodging the grabbing hand hypothesis*, which implicitly assumes voters' strong preferences against corrupt officials and/or a strongly-institutionalized environment. This view has been pervasive in the empirical literature on corruption.

Still, this conflicting relationship is no longer valid once we move into weakly institutionalized environments where political agents and voters collude more easily so that bribes are in the interest of both sides. The *shaking the grabbing hand hypothesis* has been theoretically explored from the seminal work of Shleifer & Vishny (1993). In these authors' work, principals are bureaucrats, but, taking a step forward in the hierarchy of political representation, actual principals are the elected politicians who simply delegate functions in the bureaucratic apparatus. Insofar as bureaucratic quality is exogenous, the black box remains closed since in a democracy such quality is shaped through the political competition between parties.

Certainly, changing the focus from bureaucrats to politicians complicates the analysis as rent-extraction and targeted redistribution enter into politicians' decision function at varying degrees of complementarity. Authors like Scott (1972) and Kahn (2000, 2005) remind us that this scenario is the natural place to start understanding institution building and its relationship with economic growth in developing countries. A theoretical framework in which institutional quality is endogenous and defined by a democratic contest is still waiting in the wings. Meanwhile, a historically informed approach is recommended to truly release the power of empirical analysis.

5 Conclusions and Extensions

A brief summary of the main arguments and results is provided in this section to finally offer some policymaking insights and draw the research extensions.

This paper aims to explore the causation that stems from *de-facto* and *de-jure* political institutions to machine politics, and from there that goes through overall institutional quality to lastly affect informality. I adopt an IV approach which allows me to reason about a sequence of causation and deal with endogenity in a sample of 64 democracies. Machine politics is proxied by electoral volatility (EV) and institutional quality is measured by the index of the rule of law, while informality is quantified by estimates of the shadow economy and statistics of labor informality. Instruments are *de-jure* political institutions insofar as they are *strategic moves* that fix the rules of later play.

Machine politics refers to targeted redistribution whereby political agents and citizens exchange political goods of medium to high excludability for electoral support. This is one type of redistribution, as the other type is programmatic. In their struggle for political survival, political agents combine both types in a portfolio that is placed at varying degrees of institutional quality. The *political exchange space*, built on historical patterns, was introduced to portray possible paths taken by the political agents' portfolio and institution building in democratic market-economies.

In weakly institutionalized environments, targeted redistribution dominates programmatic redistribution and is likely to entail rent-extraction (corruption). Targeted redistribution and rent-extraction are expected to diminish relative to programmatic redistribution as the rule of law is strengthened. However, with better institutions, rent-extraction is expected to decrease much more than targeted redistribution since constrained politicians face a trade-off consisting of being punished by voters due to corruption or being reelected by pork-barrel politics.

The portfolio theory of electoral investment explains a mechanism by which political agency veers off from dominant machine politics through democratic political competition. According to this theory, politicians diversify their investment strategies to obtain voters' support and minimize electoral risk. The model predicts that targeted redistribution will be higher when yields from private goods are much larger than those of public goods (poor electorate) or when electoral risk increases. Since electoral risk and targeted redistribution are correlated, electoral risk is operationalized with a measure of EV, which is an indicator of the stability of the party system.

The portfolio theory also establishes that polities at the middle-level of development experience an increasingly higher electoral risk and hence intense targeted redistribution in the hands of risk-averse politicians. As economic duality manifests at middle development as well, this implies that economic duality and corrupt machine politics are inherently connected. In this view, understanding how machine politics moves away from a loosely constrained environment of high electoral risk, to a constrained and politically-stable environment is tantamount to understanding how economic dualism progresses toward a fully/high productivity market-economy in a sound way. Clearly, the transition from low to high institutional quality has multiple paths, or multiple social equilibria.

One path towards an *inferior* equilibrium unfolds when political agents and citizens enter into deals that induce little investment in institution building, especially those that are related to constraints on political agency. Another path towards a *superior* equilibrium takes place once initially corrupt (or non-regulated) deals between politicians and high-productivity producers bring about positive spillovers to institution building so that the low-productivity sector is absorbed.

By integrating in its conceptual framework the *shaking the grabbing hand hypothesis* and the *dodging the grabbing hand hypothesis*, this research moves the understanding about informality forward. Even though these ideas were already in the literature, the historical approach underscored here brings up compelling arguments that purely empirical or theoretical studies cannot.

In order to select the instruments and establish theoretical priors about them, *de-jure* political rules are classified according to the incentives they provide as to party entry, and inter-party and intra-party competition. Centrifugal incentives bring about fragmentation in political agency. In contrast, centripetal incentives consolidate political agency into fewer parties, as well as encourages party-centered politics and less intra-party competition as the result of stable coalitional politics. Centrifugal forces increase EV, whereas centripetal forces diminish it. In this light, parliamentary regimes, small districts, majoritarian rule, and a party-centered ballot structure bring about centripetal forces and reduce EV.

This analysis confirms results already discussed in the related literature on government quality, determinants of informality and the effect of electoral rules on corruption, however, robustness is limited. Thus, holding constant historical characteristics, ethnic fractionalization negatively affects the rule of law as well as proportional rule and a small-district magnitude, while parliamentary systems have a positive impact on institutional quality.

Although I arrive at similar places as other related studies, the means to get there were not the same. The main contribution of this research is to bring political structure into the picture, here the party system, insofar as it is a key intermediating mechanism between political institutions (*de-facto* and *de-jure*) and social outcomes (political and economic). In other studies the political structure is a black box that readily disappears when estimating reduced-form equations. Here, machine politics is a political outcome that substantially shapes institutional quality and hence economic outcomes such as income level and informality.

Policymaking Insights

This analysis suggests that effects of *de-jure* rules on political competition are not independent of their interaction with *de-facto* rules . Accordingly, ethnically fragmented democracies face higher difficulties in institutional building (i.e. Bolivia, India). High turnover of political parties (measured by the standard deviation of the ENP) is closely connected to the underprovision of a fundamental public good as the rule of law, e.g. if high political-party turnover in Eastern Europe continues, it could testify to a deterioration of the rule of law and an increase in informality.

This policymaking insight indicates that by effectively regulating political competition so as to make it more stable, young democracies could work on institution building and thus permanently reduce their levels of informality. This insight certainly reinforces the extant approach in development policymaking that emphasizes the enhancement of institutional quality. Nonetheless, my insight qualifies this approach by stressing the key role of political parties and the complex relationship with *de-jure* political rules since such a regulation is country-specific.

In certain young democracies the grabbing hand is intensively shaken, which warns us about the fact that corruption and targeted redistribution have the power to hinder institution building by comfortably accommodating both sides of the deal (politicians and voter-producers) in the existing framework. Only by understanding how such deals are reproduced and entrenched, we would have a chance to dismantle these political machines or at least undermine their deals. Perhaps, in this way the forces that trigger the creative destruction that political and economic markets are supposed to experience in a democratic market-economy, can be released.

Extensions

As was mentioned before, a time-series analysis is necessary to truly track the effect of reforms in electoral rules and establish their *strategic move* character. More disaggregated data, even at within-country levels could eventually help me to find finer patterns of political and economic development, and consequently disclose nonlinearities and interactions with local factors that are hidden in cross-country analyses.

Finally, a formalization of the relationships illustrated in the *political exchange space* would greatly sharpen conjectures and may offer clear-cut predictions. In my view, this requires a dynamic model of political competition in which targeted redistribution and rent-extraction are allowed and, most importantly, in which both possibilities influence voter-producers' allocation of factors. In this way, political competition among parties would endogenously determine institutional quality.

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A APPENDIX

Table 1: List of Countries

Number	Country	Region	Number	Country	Region
1	ARGENTINA	LA	33	KOREA, SOUTH	ASIA
2	AUSTRALIA	OECD	34	LATVIA	EE
3	AUSTRIA	OECD	35	MACEDONIA	EE
4	BELGIUM	OECD	36	MALAYSIA	ASIA
5	BENIN	AFRICA	37	MAURITIUS	AFRICA
6	BOLIVIA	LA	38	MEXICO	LA
7	BOSTWANA	AFRICA	39	MONGOLIA	ASIA
8	BRAZIL	LA	40	NETHERLANDS	OECD
9	BULGARIA	EE	41	NEW ZEALAND	OECD
10	CANADA	OECD	42	NICARAGUA	LA
11	CHILE	LA	43	NORWAY	OECD
12	COLOMBIA	LA	44	PANAMA	LA
13	COSTA RICA	LA	45	PAPUA N. G.	ASIA
14	CZECH REPUBLIC	EE	46	PARAGUAY	LA
15	DENMARK	OECD	47	PERU	LA
16	DOMINICAN REP.	LA	48	PHILIPPINES	ASIA
17	ECUADOR	LA	49	POLAND	EE
18	EL SALVADOR	LA	50	PORTUGAL	OECD
19	ESTONIA	EE	51	ROMANIA	EE
20	FINLAND	OECD	52	RUSSIA	EE
21	FRANCE	OECD	53	SPAIN	OECD
22	GERMANY	OECD	54	SRI LANKA	ASIA
23	GREECE	OECD	55	SWEDEN	OECD
24	GUATEMALA	LA	56	SWITZERLAND	OECD
25	HONDURAS	LA	57	TAIWAN, CHINA	ASIA
26	HUNGARY	EE	58	THAILAND	ASIA
27	INDIA	ASIA	59	TRINIDAD%TOBAGO	LA
28	IRELAND	OECD	60	TURKEY	ASIA
29	ISRAEL	ASIA	61	UNITED KINGDOM	OECD
30	ITALY	OECD	62	UNITED STATES	OECD
31	JAMAICA	LA	63	URUGUAY	LA
32	JAPAN	OECD	64	VENEZUELA	LA

Table A1

Electoral Volatility (EV, %) and Effective Number of Parties (ENP)

		Election Year		Elections	EV(mean)		EV (sd)		ENP (mean)		ENP (sd)	
Country	Region	First	Last	Number	1945-	1990-	1945-	1990-	1945-	1990-	1945-	1990-
ARGENTINA	LA	1983	2003	11	22.5	22.9	8.1	9.7	3.8	3.9	0.9	1.0
AUSTRALIA	OECD	1901	2004	41	8.1	8.7	6.7	1.4	2.9	3.2	0.3	0.2
AUSTRIA	OECD	1945	2002	18	6.6	11.4	5.3	6.5	2.8	3.5	0.5	0.4
BELGIUM	OECD	1946	2003	19	11.8	13.3	5.1	3.9	6.3	9.6	2.7	0.6
BENIN	AFRICA	1991	1999	3	68.3	68.3	13.2	13.2	9.0	9.0	7.3	7.3
BOLIVIA	LA	1978	2005	9	45.2	48.8	14.8	12.5	4.7	5.0	1.1	1.5
BOSTWANA	AFRICA	1979	2004	6	11.8	14.3	5.8	6.6	2.3	2.5	0.3	0.2
BRAZIL	LA	1986	2006	6	18.8	18.8	9.8	9.8	9.3	9.3	1.0	1.0
BULGARIA	EE	1990	2005	6	39.3	39.3	13.7	13.7	4.1	4.1	1.0	1.0
CANADA	OECD	1953	2006	18	12.0	16.8	9.0	14.4	3.3	3.9	0.5	0.1
CHILE	LA	1989	2005	5	13.9	13.9	6.3	6.3	6.7	6.7	0.2	0.2
COLOMBIA	LA	1958	2006	17	15.9	32.2	15.5	12.7	2.9	4.3	1.7	2.2
COSTA RICA	LA	1913	2006	29	37.0	18.7	28.1	10.2	2.9	3.6	0.8	1.0
CZECH REPUBLIC	EE	1990	2002	5	31.8	31.8	14.2	14.2	5.5	5.5	1.2	1.2
DENMARK	OECD	1945	2005	23	11.2	11.5	5.7	2.3	4.8	4.8	0.9	0.2
DOMINICAN REPUBLI(	LA	1978	2006	8	33.2	39.9	24.2	26.0	3.4	3.6	0.8	0.9
ECUADOR	LA	1979	1998	9	27.5	26.2	9.1	3.6	8.2	7.0	1.9	0.9
EL SALVADOR	LA	1985	2006	8	17.8	17.0	6.2	6.3	3.5	3.6	0.5	0.4
ESTONIA	EE	1992	2003	4	44.7	44.7	9.9	9.9	6.1	6.1	0.7	0.7
FINLAND	OECD	1917	2003	27	9.1	9.7	5.3	2.2	5.6	5.8	0.4	0.1
FRANCE	OECD	1946	2002	15	18.8	22.7	5.6	7.8	5.3	6.2	0.8	0.8
GERMANY	OECD	1949	2005	16	8.0	8.0	3.8	1.2	3.5	3.9	0.5	0.3
GREECE	OECD	1974	2004	10	11.5	8.9	7.5	4.9	2.8	2.7	0.4	0.2
GUATEMALA	LA	1985	2003	6	52.4	52.4	17.8	17.8	5.8	5.8	1.3	1.3
HONDURAS	LA	1981	2005	7	6.8	7.3	2.1	2.2	2.3	2.4	0.2	0.2
HUNGARY	EE	1990	2002	4	30.1	30.1	0.7	0.7	4.6	4.6	1.5	1.5
INDIA	ASIA	1951	2004	16	29.6	26.6	12.8	11.2	4.9	6.0	1.4	1.6
IRELAND	OECD	1951	2002	14	8.6	11.1	3.6	3.5	3.2	3.9	0.5	0.0

Table A1 (cont.)

Electoral Volatility (EV, %) and Effective Number of Parties (ENP)

		Election Year		Elections	EV(mean)		EV (sd)		ENP (mean)		ENP (sd)	
Country	Region	First	Last	Number	1945-	1990-	1945-	1990-	1945-	1990-	1945-	1990-
ISRAEL	ASIA	1949	2003	16	20.1	24.5	6.2	5.7	5.4	7.0	1.6	2.2
ITALY	OECD	1948	2001	14	15.4	29.4	13.5	16.8	4.9	6.9	1.4	0.5
JAMAICA	LA	1959	2002	11	14.7	5.8	18.9	2.5	1.9	2.0	0.2	0.1
JAPAN	OECD	1952	2005	20	14.1	22.5	13.8	16.4	3.4	3.8	0.7	0.8
KOREA, SOUTH	ASIA	1988	2004	5	36.6	36.6	14.7	14.7	3.6	3.6	0.4	0.4
LATVIA	EE	1993	2002	4	47.6	47.6	4.9	4.9	8.7	8.7	3.2	3.2
MACEDONIA	EE	1990	2006	5	38.3	38.3	8.7	8.7	4.6	4.6	0.5	0.5
MALAYSIA	ASIA	1978	2004	7	13.3	16.5	7.8	6.1	2.5	2.5	0.3	0.4
MAURITIUS	AFRICA	1976	2000	7	22.3	28.7	14.0	15.5	2.3	2.3	0.2	0.2
MEXICO	LA	1985	2006	8	25.6	23.4	10.0	8.9	3.3	3.3	0.7	0.8
MONGOLIA	ASIA	1992	2004	4	32.2	32.2	9.1	9.1	2.7	2.7	0.4	0.4
NETHERLANDS	OECD	1946	2003	18	12.5	21.3	7.7	7.1	5.0	5.5	1.0	0.5
NEW ZEALAND	OECD	1951	2005	19	12.0	19.9	6.9	1.9	2.9	3.6	0.6	0.6
NICARAGUA	LA	1990	2006	4	47.1	47.1	27.2	27.2	2.8	2.8	0.6	0.6
NORWAY	OECD	1945	2005	16	11.3	17.1	6.3	1.6	4.2	5.3	0.8	0.6
PANAMA	LA	1994	2004	3	27.9	27.9	4.5	4.5	5.1	5.1	0.9	0.9
PAPUA NEW GUINEA	ASIA	1982	1997	4	27.8	21.5	10.9	8.5	3.7	2.5	1.4	0.1
PARAGUAY	LA	1989	2003	4	52.4	52.4	14.2	14.2	3.0	3.0	1.1	1.1
PERU	LA	1980	2006	7	50.3	50.7	10.6	11.8	4.9	5.2	1.8	1.7
PHILIPPINES	ASIA	1987	1998	4	44.8	44.8	12.1	12.1	4.2	4.2	0.9	0.9
POLAND	EE	1991	2005	5	45.5	45.5	10.0	10.0	6.2	6.2	2.5	2.5
PORTUGAL	OECD	1975	2005	12	16.1	11.9	8.4	6.5	3.4	3.0	0.6	0.1
ROMANIA	EE	1990	2004	5	46.5	46.5	19.3	19.3	5.5	5.5	1.3	1.3
RUSSIA	EE	1993	2003	4	47.2	47.2	1.7	1.7	5.7	5.7	2.1	2.1
SPAIN	OECD	1977	2004	9	17.6	10.3	14.6	2.6	3.5	3.2	0.5	0.2
SRI LANKA	ASIA	1956	2004	11	16.7	16.5	6.7	5.1	3.3	2.7	1.0	0.2
SWEDEN	OECD	1911	2002	29	8.0	13.9	3.8	1.0	3.6	4.3	0.4	0.5
SWITZERLAND	OECD	1979	2003	7	9.4	9.3	1.9	2.4	6.3	6.3	0.7	0.8

Table A1 (cont.)

Electoral Volatility (EV, %) and Effective Number of Parties (ENP)

		Election Year		Elections	EV(mean)		EV (sd)		ENP (mean)		ENP (sd)	
Country	Region	First	Last	Number	1945-	1990-	1945-	1990-	1945-	1990-	1945-	1990-
TAIWAN, CHINA	ASIA	1992	2001	4	20.3	20.3	14.1	14.1	3.2	3.2	0.3	0.3
THAILAND	ASIA	1992	2005	5	34.2	34.2	13.7	13.7	4.5	4.5	1.9	1.9
TRINIDAD AND TOBA(	LA	1966	2002	10	27.3	15.5	21.2	16.6	2.2	2.3	0.5	0.3
TURKEY	ASIA	1983	2002	6	32.7	31.2	16.6	18.8	5.4	5.8	1.1	0.9
UNITED KINGDOM	OECD	1979	2001	6	7.9	7.7	4.1	4.1	3.2	3.2	0.1	0.1
UNITED STATES	OECD	1952	2004	27	3.3	3.1	1.7	1.8	2.1	2.2	0.1	0.0
URUGUAY	LA	1984	2004	5	15.6	16.3	7.5	9.1	3.1	3.0	0.4	0.4
VENEZUELA	LA	1958	2005	11	33.8	41.9	12.3	7.0	4.2	4.5	1.7	2.4

Notes: For Latin American countries Payne, Zovatto&Diaz(2007). For the rest of countries data was obtained by request from Mainwaring, Scott. Most of this sample was introduced in Mainwaring&Zoco(2007) and Mainwaring&Torcal (2006). Calculations based on electoral data at party level for lower chamber elections. In countries with mixed electoral rule (proportional representation and simple/relative majority) votes were weighted by the proportion of seats elected under each system. These countries are Bolivia, Mexico, Japan, Thailand, Hungary and Russia. Country notes with details on sources by Mainwaring are available.

Table A2

Democratic Quality

country	First year of democratic rule	Polity2	Freedom House Index	Democratic Executive (c. years)	Party Age	Rule of law	Log of GDP pc
ARGENTINA	1983	7.6	2.4	16.5	21.4	-0.5	9.0
AUSTRALIA	1901	10.0	1.0	69.5	70.2	1.7	10.1
AUSTRIA	1945	10.0	1.0	45.5	69.4	1.8	10.1
BELGIUM	1853	9.7	1.1	69.5	52.9	1.3	10.1
BENIN	1991	5.9	2.2	7.6	9.5	-0.5	5.8
BOLIVIA	1982	8.6	2.6	10.5	15.0	-0.7	7.0
BOSTWANA	1966	7.7	2.1	7.5	35.0	0.6	8.3
BRAZIL	1985	8.0	2.6	10.5	15.8	-0.3	8.3
BULGARIA	1990	8.5	2.1	9.6	9.7	-0.1	7.7
CANADA	1867	10.0	1.0	69.5	88.6	1.7	10.1
CHILE	1989	8.7	1.6	10.5	16.0	1.3	8.6
COLOMBIA	1957	7.5	3.4	26.5	131.8	-0.7	7.9
COSTA RICA	1841	10.0	1.3	51.5	32.6	0.6	8.4
CZECH REPUBLIC	1990	9.5	1.5	10.0	31.1	0.9	8.8
DENMARK	1915	10.0	1.0	69.5	102.6	1.9	10.4
DOMINICAN REPUBLIC	1978	7.3	2.5	7.0	44.8	-0.6	8.0
ECUADOR	1979	7.4	2.7	20.5	25.0	-0.9	7.4
EL SALVADOR	1984	7.0	2.7	15.5	23.0	-0.6	7.8
ESTONIA	1991	7.6	1.4	9.0	7.3	0.9	8.7
FINLAND	1917	10.0	1.0	69.5	68.1	1.9	10.2
FRANCE	1946	9.0	1.3	69.5	26.2	1.4	10.0
GERMANY	1949	10.0	1.3	51.5	62.3	1.6	10.1
GREECE	1975	10.0	1.8	25.5	25.0	0.8	9.5
GUATEMALA	1985	6.5	3.9	14.5	9.0	-1.1	7.5
HONDURAS	1982	6.6	2.9	18.5	93.0	-0.9	7.2
HUNGARY	1990	10.0	1.4	9.6	12.9	0.9	8.7
INDIA	1950	8.8	2.8	10.5	20.7	0.2	6.4

Table A2 (cont.)

Democratic Quality

country	First year of democratic rule	Polity2	Freedom House Index	Democratic Executive (c. years)	Party Age	Rule of law	Log of GDP pc
IRELAND	1921	10.0	1.0	69.5	54.2	1.6	10.3
ISRAEL	1948	9.6	1.8	51.5	24.2	0.9	9.9
ITALY	1945	10.0	1.3	23.5	19.9	0.6	9.9
JAMAICA	1959	9.2	2.5	4.6	59.0	-0.4	8.2
JAPAN	1868	10.0	1.5	23.5	24.5	1.3	10.6
KOREA, SOUTH	1988	7.2	1.9	12.5	5.6	0.9	9.5
LATVIA	1991	8.0	1.5	7.7	4.2	0.6	8.5
MACEDONIA	1990	7.3	3.1	4.7	8.2	-0.4	7.5
MALAYSIA	1957	3.6	4.4	13.5	27.2	0.5	8.4
MAURITIUS	1968	10.0	1.5	7.6	23.1	1.0	8.4
MEXICO	1994	5.5	2.9	5.8	41.3	-0.4	8.7
MONGOLIA	1992	9.0	2.6	3.9	50.1	-0.1	6.4
NETHERLANDS	1917	10.0	1.0	69.5	38.8	1.7	10.1
NEW ZEALAND	1906	10.0	1.0	69.5	55.0	1.8	9.6
NICARAGUA	1990	7.7	3.0	15.5	27.1	-0.7	6.7
NORWAY	1898	10.0	1.0	69.5	90.5	1.9	10.6
PANAMA	1994	8.8	1.8	15.5	14.5	-0.1	8.4
PAPUA NEW GUINEA	1975	4.0	2.8	17.5	17.0	-1.0	6.4
PARAGUAY	1989	6.8	3.1	10.5	47.6	-1.0	7.2
PERU	1979	5.3	3.0	19.5	27.9	-0.7	7.8
PHILIPPINES	1987	8.0	2.9	8.4	16.5	-0.4	7.0
POLAND	1989	9.0	1.5	10.0	10.3	0.6	8.6
PORTUGAL	1976	10.0	1.0	23.5	26.1	1.2	9.4
ROMANIA	1989	7.4	2.6	7.9	8.4	-0.1	7.7
RUSSIA	1992	4.4	4.4	7.7	6.1	-0.9	7.8
SPAIN	1978	10.0	1.3	22.5	67.1	1.2	9.7
SRI LANKA	1948	5.3	3.7	10.5	31.3	0.0	6.9

Table A2 (cont.)

Democratic Quality

country	First year of democratic rule	Polity2	Freedom House Index	Democratic Executive (c. years)	Party Age	Rule of law	Log of GDP pc
SWEDEN	1917	10.0	1.0	69.5	64.7	1.8	10.4
SWITZERLAND	1848	10.0	1.0	69.5	94.5	1.8	10.5
TAIWAN, CHINA	1992	7.9	2.4	6.0	54.8	0.9	
THAILAND	1992	6.5	3.8	6.5	24.9	0.2	7.8
TRINIDAD AND TOBAGO	1962	9.7	2.1	9.0	27.0	0.1	9.1
TURKEY	1982	7.5	3.8	15.5	22.5	0.0	8.5
UNITED KINGDOM	1800	10.0	1.3	69.5	114.5	1.6	10.2
UNITED STATES	1837	10.0	1.0	69.5	148.3	1.5	10.5
URUGUAY	1985	10.0	1.4	15.5	117.4	0.6	8.8
VENEZUELA	1958	6.5	3.6	21.5	35.1	-1.2	8.5

Notes: First Year of democratic rule from Persson&Tabellini (2003) except for Benin, Macedonia, Mongolia and Panamá where it corresponds to the first year of lower chamber elections. polity2: PolityIV, 2009 (http://www.systemicpeace.org/inscr/inscr.htm). It ranges from +10 (strongly democratic) to -10 (strongly autocratic). Freedom House Index: IDEA (http://www.idea.int/vt/viewdata.cfm). Democratic elected executive: It accumulates the consecutive years in which the executive has been competitively elected,ñtensysò in the Database of Political Institutions (DPI) (World Bank, 2009). Partyage is the average of the ages of the first two government parties and the first opposition party, DPI, World Bank (http://go.worldbank.org/2EAGGLRZ40). Averages over 1990-2009. Log of GDP pc (constant 2000 US\$). World Bank Indicators (http://data.worldbank.org/indicator). Rule of law index, average over 1996-2009, Kauffman et al. (2010) (http://info.worldbank.org/governance/wgi/index.asp).

Table A3

Firm and Labor Informality (%) and associated variables

Country	Firm (mean)	Firm (sd)	Labor (mean)	Labor (sd)	Self-employed (mean)	Control of corruption Index	Ease of doing bussines Index	Cost of bussiness start-up procedures	Direct taxes (% total taxes)
ARGENTINA	27.1	1.8	22.5	1.4	24.3	-0.4	113.0	12.5	
AUSTRALIA	14.0	0.4	9.9	0.5	12.6	1.9	10.0	1.9	71.1
AUSTRIA	10.4	0.6	8.1	0.7	11.8	2.0	31.0	5.7	46.1
BELGIUM	21.7	0.6	10.3	0.2	13.5	1.4	22.0	11.1	59.1
BENIN	48.2	0.9				-0.7	172.0	166.2	22.6
BOLIVIA	67.8	0.6	62.2	3.4		-0.7	148.0	162.2	14.0
BOSTWANA	34.0	0.6	11.8			0.9	50.0	10.9	
BRAZIL	41.0	1.3	31.0	3.2	25.9	0.0	124.0	10.1	38.5
BULGARIA	37.4	0.8			12.5	-0.1	51.0	9.6	23.1
CANADA	15.7	0.4			15.4	2.0	9.0	0.9	
CHILE	20.3	0.6	27.2	1.6	27.8	1.4	53.0	10.3	41.7
COLOMBIA	41.3	2.2	44.1	2.7	43.3	-0.3	38.0	24.7	37.8
COSTA RICA	27.0	0.8	21.9	1.5	26.3	0.6	121.0	12.6	
CZECH REPUBLIC	19.6	0.5	11.9	0.9	15.7	0.5	82.0	9.5	42.0
DENMARK	17.7	0.4			8.1	2.3	6.0	0.0	40.2
DOMINICAN REPUBLIC	33.2	1.0	42.3	1.4	43.8	-0.5	86.0	30.8	19.9
ECUADOR	35.4	1.2	34.2	1.2	34.3	-0.9	127.0	38.1	
EL SALVADOR	47.2	1.0	37.0	1.5	33.3	-0.5	80.0	118.0	31.1
ESTONIA	39.2	0.9	5.6	0.6	7.9	0.8	17.0	6.2	20.9
FINLAND	17.8	0.4			12.1	2.3	11.0	1.2	36.4
FRANCE	14.9	0.4	6.6	0.4	9.9	1.4	28.0	1.2	46.4
GERMANY	16.4	0.4	6.1	0.3	11.1	1.9	21.0	4.7	41.6
GREECE	28.5	0.3	30.3	2.8	30.1	0.5	97.0	22.0	40.1
GUATEMALA	51.9	0.5	55.0			-0.7	100.0	58.4	27.7
HONDURAS	50.7	1.0	49.3	1.3	39.2	-0.8	128.0	65.6	26.4
HUNGARY	25.7	0.6	8.3	1.5	13.2	0.6	52.0	22.4	33.0
INDIA	24.3	1.3				-0.4	135.0	62.0	44.3
IRELAND	15.6	0.3	12.0	0.8	16.6	1.6	8.0	5.3	47.3
ISRAEL	22.9	1.0	7.3	0.3	12.8	1.1	30.0	5.3	45.7
ITALY	26.6	0.8	18.4	4.6	24.9	0.5	76.0	20.7	54.6
JAMAICA	37.7	1.3	36.1	1.4	36.4	-0.4	79.0	11.8	41.6
JAPAN	11.0	0.2	12.3	1.2	10.2	1.2	19.0	10.7	
KOREA, SOUTH	28.1	0.7	27.1	1.9	27.0	0.5	15.0	15.7	42.7
LATVIA	40.6	0.7	9.4	1.8	9.3	0.1	27.0	4.2	23.3
MACEDONIA	35.2	1.1	21.5	2.1	17.7	-0.5	36.0	11.3	19.2

Table A3

Firm and Labor Informality (%) and associated variables

country	Firm (mean)	Firm (sd)	Labor (mean)	Labor (sd)	Self-employed (mean)	Control of corruption Index	Ease of doing bussines Index	Cost of bussiness start-up procedures	Direct taxes (% total taxes)
MALAYSIA	31.6	0.6	21.7	0.9	20.0	0.4	23.0	26.6	61.5
MAURITIUS			16.5	0.3	17.3	0.5	20.0	8.8	
MEXICO	31.7	1.6	31.5	1.6	28.3	-0.2	41.0	15.6	
MONGOLIA	19.5	1.0				-0.3	63.0	9.6	
NETHERLANDS	12.9	0.3	9.3	0.1	11.8	2.1	29.0	13.0	45.3
NEW ZEALAND	12.6	0.3	12.4	0.6	17.9	2.3	3.0	0.2	65.6
NICARAGUA	46.8	1.5	46.4	1.6	36.9	-0.6	119.0	143.8	28.6
NORWAY	18.8	0.4	6.0	0.4	7.1	2.0	7.0	2.7	56.2
PANAMA	64.8	0.6	30.3	1.6	31.3	-0.3	62.0	14.4	
PAPUA NEW GUINEA	37.3	1.3				-1.1	108.0	27.7	
PARAGUAY	29.3	2.0	45.6	1.6		-1.2	105.0	147.8	17.4
PERU	60.4	0.5	41.9	1.8	39.5	-0.3	46.0	38.0	31.6
PHILIPPINES	44.5	1.1	44.5	0.9	37.0	-0.5	146.0	26.9	45.8
POLAND	28.2	0.7			20.5	0.5	73.0	22.2	24.6
PORTUGAL	22.4	0.4	19.5	0.9	23.5	1.2	33.0	13.4	36.0
ROMANIA	36.0	1.5			21.4	-0.2	54.0	5.3	
RUSSIA	47.4	1.3	36.0	4.5	7.7	-0.9	116.0	8.8	
SPAIN	22.4	0.4	12.8	1.2	16.5	1.2	48.0	16.5	62.0
SRI LANKA	45.9	1.3	39.8	1.4	32.8	-0.2	102.0	10.4	15.6
SWEDEN	18.9	0.5			10.3	2.2	18.0	0.7	25.6
SWITZERLAND	9.1	0.5	10.2	0.5	14.0	2.1	24.0	8.7	33.9
TAIWAN, CHINA	26.6	1.2	21.9	1.7		0.7			
THAILAND	53.4	0.8	55.2	2.1	34.8	-0.2	16.0	6.1	40.2
TRINIDAD AND TOBAGO			16.9	1.0	19.2	0.1	95.0	1.3	60.0
TURKEY	33.2	1.1	42.4	5.8	29.8	-0.1	60.0	27.4	
UNITED KINGDOM	12.5	0.3			12.7	1.9	4.0	0.7	50.5
UNITED STATES	8.6	0.2			7.4	1.5	5.0	0.8	91.2
URUGUAY	51.5	0.4	25.3	1.3	27.3	0.9	122.0	43.9	15.7
VENEZUELA	35.1	1.6	29.8			-1.0	170.0	27.8	39.1

Notes: Firm informality: % of official GDP using the DYMIMIC and currency demand method. Average of 2000, 2002, 2003. Schneider (2008, p.144). Labor informality: ratio of own-account workers and contributing family workers over total employment, average over 1999-2008. Data from Labor Force Surveys. ILO Statistics (http://laborsta.ilo.org/). Control of corruption index, average over 1996-2009, Kauffman et al. (2010). (http://info.worldbank.org/governance/wgi/index.asp). Self-employed (% of total employed); Ease of doing business Index ranging in [1,183] (1=most friendly environment); Cost of business start-up procedures (% of GNI per capita); Direct taxes correspond to taxes on income, profits and capital gain (%of total taxes): 2005 values, World Bank Indicators (http://data.worldbank.org/indicator).

Table A4

Correlations between Alternative Measures of Institutional Quality

	Rule of Law	Control of Corruption	Regulatory Quality	Governance Effectiveness	Political Stability	Voice&Accountability	Ease of Doing Business Index	Cost of business Start-up procedures	Fredom House Index
Rule of Law	1								
Control of Corruption	0.9716*	1							
Regulatory Quality	0.9434*	0.9438*	1						
Governance Effectiveness	0.9760*	0.9759*	0.9585*	1					
Political Stability	0.7909*	0.8170*	0.7707*	0.7788*	1				
Voice&Account.	0.9165*	0.9255*	0.8994*	0.9047*	0.8731*	1			
Ease of Doing Business Index	-0.5171*	-0.5303*	-0.5415*	-0.5511*	-0.3504*	-0.4638*	1		
Cost of business Start-up procedures	-0.7357*	-0.7460*	-0.7966*	-0.7697*	-0.5564*	-0.6186*	0.5939*	1	
Fredom House Index	-0.8082*	-0.8196*	-0.7963*	-0.7826*	-0.8277*	-0.9532*	0.3483*	0.5030*	1
Polity2	0.7184*	0.7287*	0.6954*	0.6810*	0.6615*	0.8376*	-0.3282*	-0.3955*	-0.8470*

Note: *Significant at 5%

Table A5
List of Variables

Variables	Code	Description	Values	Source
Informality	Finf (firm)	% of official GDP using the DYMIMIC and currency demand method. Average of 2000, 2002, 2003.	0-100%	Schneider (2008, p.144).
	Linf (labor)	Ratio of own-account workers and contributing family workers over total employment, average over 1999-2008. For Bulgaria, Canada, Denmark, Finland, UK, Poland, Romania, Sweden and the US labor informality corresponds to self-employed (% of total employed), 2005 values.	0-100%	Labor Force Surveys. ILO Statistics (http://laborsta.ilo.org/) and World Bank Indicators
Electoral Volatility	EV	$\left(EV = \sum_{1=n}^{n} \lvert \mathbf{p_t} - \mathbf{p_{t-1}} \rvert\right) / \mathbf{2}$ where n is the number of parties with at least one vote and p is each party's vote share. Calculations based on electoral data at party level for lower chamber elections. In countries with mixed electoral rule (proportional representation and simple/relative majority) votes were weighted by the proportion of seats elected under each system. These countries are Bolivia, Mexico, Japan, Thailand, Hungary and Russia. Country	0-100%	For Latin American countries Payne, Zovatto&Diaz (2007). For the rest of countries Mainwaring, S. by direct request (notes with details on country sources are available).
Effective Number of Parties	ENP	$ENP = \frac{1}{\sum_{i=n}^{n} p_i^2}$ where n is the number of parties with at least one vote and p^2 is the square of each party's proportion of all votes.	>0	
Rule of Law	rol	It captures perceptions of the extent to which agents have confidence in and abide by the rules of society, and in particular the quality of contract enforcement, property rights, the police, and the courts, as well as the likelihood of crime	[-2.5,2.5] with higher values corresponding to stronger rule of law	Kauffman et al. (2010). http://info.worldbank.org/governance/wgi/index.asp

		and violence. Average over 1996-2009		
Control of Corruption	cc	It captures perceptions of the extent to which public power is exercised for private gain, including both petty and grand forms of corruption, as well as "capture" of the state by elites and private interests. Average over 1996-2009	[-2.5,2.5] with higher values corresponding to stronger control.	
Ethnic Fractionalization		It is measured by the probability that two randomly drawn individuals from the population belong to two different groups.	[0,1]	Alesina et al., 2003
Log GDP pc		Constant 2000 USD per capita	>0	World Bank Indicators http://data.worldbank.org/indicator
Ease of doing business Index		ranging in [1,183] (1=most friendly environment);	[1,183]	
Cost of business start-up procedures		% of GNI per capita	[0,100]	
Direct taxes		taxes on income, profits and capital gain as a % of total taxes, 2005 values	[0,100]	
De- jure Rules[1]				
Variables	**Code**	**Description**	**Values**	**Source**
Constitution-al regime	pres	Forms of government	1 presidential 0 otherwise	Persson&Tabellini(2003)
	system	Forms of government (2000 value)	0 Presidential 1 Assembly-elected president 2 Parliamentary	Database of Political Institutions, World Bank, (2009) http://go.worldbank.org/2EAGGLRZ40
District magnitude	mdmh	Mean district magnitude lower house Weighted average of the number of representatives elected by each constituency size	Average number of seats per district (≥1)	Database of Political Institutions, World Bank, (2009)
	dm	Average District magnitude	Number of legislators per	Seddon et al. (2002)

[1] Variables from P&T(2003) are mean values over the period 1990-1998; DPI (2009) mean values over 1990-2009 except for *system*, *housesys*, *pr* and *cl* which correspond to the 2000 value. Seddon et al. (2002) means over 1990-2001, except bicameral that takes the median over this period. Variables such as magn, sdm, and list have corresponding versions called magn1, sdm1 and list1 that have more observations and/or are rescaled to range 0 and 1. These versions are preferred in all calculations.

			district (≥1)	
	magn/ magn1	=1/dm=districts/seats Average size of voting districts in terms of the number of legislative seats in the district	[0, 1] 0: a single national district (Maj=0, PR=1) 1: single-member district (Maj=1, PR=0)	Persson&Tabellini(2003)
	sdm	Weighted average of districts per seat.	[0, 1]	Persson&Tabellini(2003)
	sdm1	=1/mdmh. Weighted average of districts per seat (similar to magn). Single-district member	[0, 1]	Database of Political Institutions, World Bank, (2009)
	smd	Proportion of legislators from single-member districts	[0, 1]	Seddon et al. (2002)
	propn	Proportion of legislators from national districts	[0, 1]	Seddon et al. (2002)
	seats	Number of seats in lower of single chamber	Number of seats in the lower house (≥1)	Persson&Tabellini(2003)
	totalseats	Total seats in the legislature, if bicameral, in the lower chamber	Number of seats in the lower house (≥1)	Database of Political Institutions, World Bank, (2006)
Electoral Formula	housesys	Electoral rule that governs the election of the majority of legislators in the lower house (2000 value)	1: plurality 0: proportional	Database of Political Institutions, World Bank, (2009)
	maj[2]	Majoritarian rule (plurality, or FPP first-past-the-post)	"1" plurality rule for all the lower house	Persson&Tabellini(2003)
	pr	Proportional representation in 2000	1: pr is used 0: otherwise	Database of Political Institutions, World Bank, (2009)
	pind[3]	=1-(list/seats) Proportion of individual candidates elected by plurality (list occurs with PR)	[0, 1] 0: Party lists (Maj=0, PR=1) (0-1): mixed	Persson&Tabellini(2003)

[2] DPI(2009) has a variable with the same name but different meaning.
[3] Continuous measure of ballot structure and the electoral formula (measure related to career concerns).

			systems 1: Plurality (Maj=1, PR=0)	
	pindo	=1-(list/seats)*clist Proportion of legislators elected individually or on open lists	[0, 1] 0: closed party lists (Maj=0, PR=1) (0-1): mixed systems 1: Plurality (or open list)	Persson&Tabellini(2003)
Ballot structure: list	list[4]	Party list: Number of lower-house legislators elected through party list system	Number of legislators (≥1)	Persson&Tabellini(2003)
	list1	list1=list/seats	[0, 1]	Persson&Tabellini(2003)
	cl	Under a pr system voters' expression of preferences for candidates (2000 value)	1: close list 0: open list	Database of Political Institutions, World Bank, (2009)
Ballot structure (particularism)	ballot[5]	Party control over access to and position on ballot	"0" high party control (close list) "1" intermediate party (not many independent candidates) "2" low party control (independents run for office)	Seddon et al. (2002)
	pool[6]	Sharing of votes across candidates of the same party	"0" votes cast are pooled across the whole party "1" pooled at the sub-party level "2" votes for a candidate	Seddon et al. (2002)

[4] Party list voting can be of three types: closed lists, open lists (or preference vote) and panachage. Another continuous measure of the ballot structure.
[5] Degree of control that a party leader exercises over access to her party's label.
[6] The extent to which a candidate can ride his party's reputation to electoral success.

			contribute only to that candidate	
	Vote	Candidate or party specific vote. Also, number of candidates that voters support	"0" single vote for party "1" Multiple votes across candidates "2" single vote for a single candidate	Seddon et al. (2002)
	indexp	Average of ballot, pool and vote	[0,2]	Seddon et al. (2002)
Threshold	thresh	Minimum vote threshold for representation in PR systems (no information gets 0)	Percentage	Database of Political Institutions, World Bank, (2009)
Bicameral	bicameral	Two legislative bodies (median over 1990-2001)	"1" if bicameral	Seddon et al. (2002)

Table A5
List of Variables (cont.)

Variables	**Code**	**Description**	**Values**	**Source**
Age of democracy	Dem_age	First year of democratic rule, based on polity	year	Persson&Tabellini(2003)
	Age	=(2000-dem_age)/2000	[0,1]	Persson&Tabellini(2003)
	demage[7]		Year	Persson&Tabellini(2003) and Mainwaring, S.
	demage1	=2008-dem_age	Number of democratic years	
Age of main parties	Partyage	Average of the ages of the first two government parties and the first opposition party. Averages over 1990-2009.	≥0	Database of Political Institutions, World Bank, (2009)
Quality of democracy	LIEC	Legislative and Executive Indices of Electoral Competitiveness (below 6, the country is deemed autocratic or without consolidates democratic institutions)	1. No legislature 2. Unelected legislature 3. Elected 1 candidate 4. 1 party multiple candidates 5. Multiple parties only one party won seats 6. Multiple parties but the largest	Database of Political Institutions, World Bank, (2009)

[7] Benin, Macedonia, Mongolia and Panamá this year corresponds to the first year of lower chamber elections (Mainwaring)

			party received more than 75% 7. Largest party got less than 75%	
Democratic elected executive	tensys	It accumulates the consecutive years in which the executive has been competitively elected	Number of years since EIEC remains 6 or 7	Database of Political Institutions, World Bank, (2009)
polity2	polity2	It ranges from +10 (strongly democratic) to -10 (strongly autocratic).	[-10,10]	PolityIV, 2009 http://www.systemicpeace.org/inscr/inscr.htm
Freedom House Index		Average of the indexes of political rights and civil liberties for 1990-2010.	Scale from 1 to 7: 1 represents the highest degree of freedom and 7 the lowest (a score between 1.0 and 2.5 are considered free, between 3.0 and 5.5 partly free and between 5.5 and 7.0 not free)	IDEA http://www.idea.int/vt/viewdata.cfm
Turnout		The total number of votes cast (valid or invalid)/ total voters' register	% [0,100]	
Invalid Votes		Invalid ballots/total votes cast	% [0,100]	
Reform	reform6	Change in dm and mdmh over 1990-2008	1: change 0: otherwise	Seddon et al. (2002), and Database of Political Institutions, World Bank, (2009)
	reform2	Change in housesys over 1990-2008		Database of Political Institutions, World Bank, (2009)
	reform3	Change in threshold over 1990-2008		
	reform4	Change in bicameral over 1990-2001		Seddon et al. (2002)
	reformb	Change in ballot over 1990-2001		
	reformp	Change in pool over 1990-2001		
	reformv	Change in vote over 1990-2001		
	reform	Sum of all reforms	[0-7]: from no reforms to seven types of reforms	

Table A6a

Statistical Summary De-jure Political Institutions

Variable	Obs	Mean	Std. Dev.	Min	Max	Source
pres	60	0.4	0.5	0	1	P&T(2003)
system	64	1.1	1.0	0	2	DPI (2009)
mdmh	64	15.1	32.7	1	197	DPI (2009)
dm	60	12.2	22.9	1	120	Seddon et al.(2001)
magn1	63	0.4	0.4	0	1	P&T(2003)
sdm1	64	0.3	0.4	0	1	Seddon et al.(2001)
propn	61	0.1	0.2	0	1	Seddon et al.(2001)
housesys	63	0.4	0.5	0	1	DPI (2009)
maj	60	0.3	0.5	0	1	P&T(2003)
pr	64	0.8	0.4	0	1	DPI (2009)
pind	60	0.4	0.4	0	1	P&T(2003)
pindo	60	0.5	0.5	0	1	P&T(2003)
list	59	146.0	133.0	0	510	P&T(2003)
list1*	59	0.7	0.4	0	1	P&T(2003), DPI (2009
cl	50	0.7	0.5	0	1	DPI (2009)
ballot	61	0.7	0.5	0	2	Seddon et al.(2001)
pool	61	0.7	0.8	0	2	Seddon et al.(2001)
vote	61	1.0	0.8	0	2	Seddon et al.(2001)
indexp**	61	0.8	0.6	0	2	Seddon et al.(2001)
thresh	50	2.4	2.5	0	10	DPI (2009)
bicameral	61	0.5	0.5	0	1	Seddon et al.(2001)
seats	60	245.9	169.7	36	656	P&T(2003)
totalseats	64	236.3	167.7	37	652	DPI (2009)
reform	64	1.5	1.5	0	5	The author

Notes: *list1=list/totalseats. **Average of ballot, pool and vote.

Table A6b

Matrix of parwise correlations of alternative measures of De-jure rules

	EV	rol	pres	system	mdmh	dm	magn1	sdm	sdm1	propn	housesys	maj	pr	pind
EV	1													
rol	-0.5892*	1												
pres	0.2851*	-0.5897*	1											
system	-0.4081*	0.5990*	-0.8469*	1										
mdmh	0.154	-0.079	0.0485	-0.2530*	1									
dm	0.1812	-0.0906	0.1232	-0.2632*	0.8759*	1								
magn1	-0.2517*	0.0871	-0.1682	0.223	-0.1593	-0.2792*	1							
sdm	-0.3255*	0.0313	-0.2974*	0.3450*	-0.2730*	-0.3326*	0.7418*	1						
sdm1	-0.2693*	0.0474	-0.1797	0.2049	-0.3210*	-0.3436*	0.8426*	0.8260*	1					
propn	0.2223	-0.1477	0.104	-0.2132	0.6549*	0.7487*	-0.015	-0.1272	-0.1329	1				
housesys	-0.1177	0.0492	-0.1518	0.1605	-0.0142	-0.1863	0.8038*	0.6078*	0.6282*	0.0661	1			
maj	-0.2588*	0.1675	-0.2675*	0.3316*	-0.2316	-0.2910*	0.8294*	0.7452*	0.8239*	-0.0938	0.8190*	1		
pr	0.2327	-0.0581	0.2228	-0.2580*	0.1915	0.2425	-0.5974*	-0.8451*	-0.6209*	0.0478	-0.6757*	-0.7952*	1	
pind	-0.1523	0.0901	-0.181	0.2074	-0.0507	-0.2453	0.9025*	0.6739*	0.7408*	0.004	0.9540*	0.8814*	-0.7216*	1
pindo	-0.2253	0.2094	-0.1908	0.2081	-0.0954	-0.2585	0.6481*	0.5249*	0.5437*	-0.0653	0.7032*	0.6472*	-0.5343*	0.7150*
list	0.0734	0.0042	-0.0754	0.0059	0.1431	0.1306	-0.5905*	-0.5165*	-0.5993*	-0.0291	-0.5960*	-0.6795*	0.5596*	-0.6388*
list1	0.2072	-0.1337	0.2086	-0.2668*	0.1218	0.2387	-0.9169*	-0.6898*	-0.7792*	0.0117	-0.9163*	-0.9227*	0.7538*	-0.9738*
cl	0.2388	-0.2944*	0.2783	-0.3440*	0.126	0.136	-0.0352	-0.2197	-0.2619	0.169	0.0899	-0.0532	-0.0891	0.0376
ballot	-0.2392	0.2413	-0.3700*	0.4207*	-0.0733	-0.2801*	0.4697*	0.4158*	0.4589*	0.0079	0.4984*	0.4703*	-0.4080*	0.4766*
pool	-0.0641	-0.0256	-0.1275	0.1753	0.0183	-0.228	0.8043*	0.6499*	0.6309*	0.1007	0.7676*	0.6462*	-0.6173*	0.7815*
vote	-0.2551*	0.3042*	-0.3543*	0.3410*	-0.1399	-0.2414	0.4362*	0.4137*	0.4210*	-0.042	0.5108*	0.4283*	-0.3503*	0.4593*
indexp	-0.2072	0.1874	-0.3161*	0.3466*	-0.0727	-0.2882*	0.6940*	0.5949*	0.6038*	0.0307	0.7122*	0.6169*	-0.5526*	0.6949*
thresh	0.1917	0.0941	-0.2463	0.1288	0.0706	0.0258	0.0532	-0.1773	-0.0701	0.0872	0.047	-0.037	-0.0362	0.0486
bicameral	-0.1198	0.0909	0.0496	0.0585	-0.0232	-0.1662	0.2935*	0.217	0.2574*	-0.2488	0.1783	0.2453	-0.1116	0.2465
seats	-0.0779	0.2015	-0.2001	0.2013	0.0463	-0.0222	0.1926	0.0088	0.0335	-0.0921	0.1705	0.0548	0.0014	0.1726
totalseats	-0.1341	0.2266	-0.1972	0.2179	0.0774	-0.0236	0.2225	0.0233	0.0277	-0.0787	0.1665	0.0666	0.0236	0.1915
reform	0.5364*	-0.3396*	0.2736*	-0.2766*	0.0686	0.0628	-0.1386	-0.4252*	-0.3215*	0.1808	0.06	-0.2538	0.2112	-0.0716

Note: * significant at 5%.

Table A6b (cont.)

Matrix of parwise correlations of alternative measures of De-jure rules

	pindo	list	list1	cl	ballot	pool	vote	indexp	thresh	bicameral	seats	totalseats	reform
pindo	1												
list	-0.3043*	1											
list1	-0.6969*	0.6290*	1										
cl	-0.4685*	-0.031	-0.0095	1									
ballot	0.6186*	-0.1906	-0.4713*	-0.4853*	1								
pool	0.5773*	-0.5261*	-0.7509*	0.0222	0.5290*	1							
vote	0.6218*	-0.1393	-0.4373*	-0.4337*	0.7812*	0.4757*	1						
indexp	0.7102*	-0.3579*	-0.6697*	-0.3579*	0.8634*	0.8186*	0.8730*	1					
thresh	0.0525	0.4425*	-0.0645	0.025	0.1108	0.0886	0.0872	0.1122	1				
bicameral	0.2451	-0.0297	-0.2832*	0.1204	0.1166	0.2746*	0.0998	0.2034	-0.0936	1			
seats	0.243	0.4304*	-0.2078	-0.0248	0.1346	0.1912	0.2538	0.2362	0.5677*	0.3503*	1		
totalseats	0.2511	0.4200*	-0.2196	0.0156	0.1319	0.2022	0.2193	0.226	0.5231*	0.3902*	0.9976*	1	
reform	-0.1101	0.2581*	0.1375	0.3510*	-0.0876	0.0826	-0.01	0.0097	0.3952*	-0.2135	0.15	0.1286	1

Note: * significant at 5%.

Table A7. OLS Estimates: Dependent Variable: EV

VARIABLES	(1) EV	(2) EV	(3) EV	(4) EV	(5) EV	(6) EV	(7) EV
fraceth	12.60*	16.97**	19.83**	18.82**	15.24**	21.11***	18.32**
	(7.249)	(7.877)	(8.105)	(8.258)	(7.202)	(7.193)	(8.133)
demage1	-0.142***	-0.133***	-0.149***	-0.146***	-0.144***	-0.126***	-0.148***
	(0.0246)	(0.0284)	(0.0281)	(0.0287)	(0.0290)	(0.0285)	(0.0285)
pres	5.509						
	(3.379)						
system		-3.139*					
		(1.691)					
mdmh			0.0411				
			(0.0452)				
dm				0.0596			
				(0.0600)			
magn					-5.443		
					(4.121)		
sdm						-14.84***	
						(3.843)	
propn							8.796
							(8.423)
Constant	26.53***	30.58***	26.43***	26.14***	30.09***	28.86***	26.55***
	(3.514)	(4.307)	(3.893)	(3.872)	(3.979)	(3.746)	(3.720)
Observations	60	64	64	60	59	56	61
R-squared	0.360	0.395	0.366	0.361	0.350	0.413	0.368

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

Table A7 . OLS Estimates: Dependent Variable: EV (cont)

VARIABLES	(1) EV	(2) EV	(3) EV	(4) EV	(5) EV	(6) EV	(7) EV	(8) EV
fraceth	20.42**	16.44**	23.42***	15.49**	15.43**	14.47*	15.08**	28.39***
	(8.172)	(7.343)	(7.921)	(7.307)	(7.257)	(7.565)	(7.238)	(8.733)
demage1	-0.153***	-0.136***	-0.141***	-0.145***	-0.142***	-0.153***	-0.144***	-0.149***
	(0.0281)	(0.0280)	(0.0286)	(0.0276)	(0.0277)	(0.0288)	(0.0282)	(0.0353)
housesys	-2.411							
	(3.104)							
maj		-4.950						
		(3.230)						
pr			8.575***					
			(3.111)					
pind				-3.059				
				(3.345)				
pindo					-4.546			
					(3.263)			
list						-0.000363		
						(0.0133)		
list1							4.518	
							(3.191)	
cl								7.203**
								(3.048)
Constant	28.10***	28.40***	18.66***	28.96***	29.96***	28.84***	25.10***	20.77***
	(3.879)	(3.701)	(4.671)	(3.837)	(3.948)	(4.821)	(4.566)	(4.519)
Observations	63	60	64	60	60	59	59	50
R-squared	0.369	0.348	0.411	0.334	0.347	0.333	0.352	0.441

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

Table A7 . OLS Estimates: Dependent Variable: EV (cont)

VARIABLES	(1) EV	(2) EV	(3) EV	(4) EV	(5) EV	(6) EV	(7) EV	(8) EV
fraceth	18.58**	19.11**	18.50**	19.04**	26.42**	18.74**	18.69**	20.30**
	(8.013)	(8.269)	(8.037)	(8.073)	(10.64)	(8.332)	(7.526)	(8.252)
demage1	-0.146***	-0.153***	-0.145***	-0.147***	-0.200***	-0.152***	-0.112***	-0.156***
	(0.0278)	(0.0288)	(0.0291)	(0.0289)	(0.0437)	(0.0305)	(0.0293)	(0.0279)
ballot	-4.025							
	(3.256)							
pool		-1.021						
		(1.997)						
vote			-2.463					
			(2.276)					
indexp				-2.979				
				(2.939)				
thresh					0.697			
					(0.651)			
bicameral						-0.917		
						(3.355)		
reform							3.835***	
							(0.825)	
totalseats								0.00385
								(0.00970)
Constant	30.01***	28.20***	29.74***	29.56***	26.12***	28.06***	19.57***	26.33***
	(4.514)	(4.026)	(4.353)	(4.409)	(5.810)	(3.673)	(3.550)	(4.547)
Observations	61	61	61	61	50	61	64	64
R-squared	0.370	0.356	0.368	0.366	0.407	0.354	0.493	0.359

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

Table A8

Reforms in De-jure Political Rules (1990-2009)

Country	District Magnitude (a)	Electoral Rule (b)	Threshold (c)	Bicameral (d)	Ballot (e)	Pool (f)	Vote (g)	reform (h)
ARGENTINA	0	0	0	0	0	0	0	0
AUSTRALIA	0	0	0	0	0	0	0	0
AUSTRIA	0	0	0	0	0	0	0	0
BELGIUM	1	0	0	0	0	0	0	1
BENIN	1	0	0	0	0	0	0	1
BOLIVIA	1	1	0	0	1	1	1	5
BOSTWANA	1	0	0	0	0	0	0	1
BRAZIL	1	0	1	0	0	0	0	2
BULGARIA	1	0	0	0	0	1	1	3
CANADA	0	0	0	0	0	0	0	0
CHILE	0	0	0	0	0	0	0	0
COLOMBIA	1	0	0	0	0	0	0	1
COSTA RICA	0	0	0	0	0	0	0	0
CZECH REPUBLIC	1	0	0					1
DENMARK	1	0	0	0	0	0	0	1
DOMINICAN REPUBLI	1	0	0	0	0	0	0	1
ECUADOR	1	1	0	0	0	0	0	2
EL SALVADOR	1	1	0	0	0	0	0	2
ESTONIA	0	0	0					0
FINLAND	1	0	0	0	0	0	0	1
FRANCE	0	0	1	0	0	0	0	1
GERMANY	1	0	0	0	0	0	0	1
GREECE	0	0	0	0	0	0	0	0
GUATEMALA	1	0	1	0	1	1	1	5
HONDURAS	1	0	0	0	0	0	0	1
HUNGARY	1	1	0	0	0	0	0	2
INDIA	0	0	0	0	0	0	0	0
IRELAND	0	0	0	0	0	0	0	0
ISRAEL	0	0	0	0	0	0	0	0
ITALY	1	1	0	0	0	1	1	4
JAMAICA	0	0	0	0	0	0	0	0
JAPAN	1	0	0	0	0	0	0	1
KOREA, SOUTH	1	0	1	0	1	1	1	5

Table A8 (cont.)

Reforms in De-jure Political Rules (1990-2009)

Country	District Magnitude (a)	Electoral Rule (b)	Threshold (c)	Bicameral (d)	Ballot (e)	Pool (f)	Vote (g)	reform (h)
LATVIA	0	0	1	0	0	0	0	1
MACEDONIA	1	1	0	0	0	0	0	2
MALAYSIA	0	0	0	0	0	0	0	0
MAURITIUS	0	0	0	0	0	0	0	0
MEXICO	1	0	1	0	0	0	0	2
MONGOLIA	1	1	0	0	1	1	1	5
NETHERLANDS	0	0	1	0	0	0	0	1
NEW ZEALAND	1	0	0	0	1	1	1	4
NICARAGUA	1	0	0	0	1	1	1	4
NORWAY	1	0	0	0	0	0	0	1
PANAMA	0	0	1	0	0	0	0	1
PAPUA NEW GUINEA	0	0	0	0	0	0	0	0
PARAGUAY	1	0	0	0	0	0	0	1
PERU	1	0	1	1	0	0	0	3
PHILIPPINES	1	0	0	0	1	1	1	4
POLAND	1	0	0	0	0	1	1	3
PORTUGAL	1	0	0	0	0	0	0	1
ROMANIA	1	1	1	0	0	0	0	3
RUSSIA	1	1	1	0	0	0	0	3
SPAIN	1	0	0	0	0	0	0	1
SRI LANKA	1	0	1	0	0	0	0	2
SWEDEN	1	0	0	0	1	0	1	3
SWITZERLAND	1	0	0	0	0	0	0	1
TAIWAN, CHINA	1	0	0					1
THAILAND	1	0	0	0	1	1	1	4
TRINIDAD&TOBAGO	0	0	0	0	0	0	0	0
TURKEY	1	0	0	0	1	0	1	3
UNITED KINGDOM	0	0	0	0	0	0	0	0
UNITED STATES	0	0	0	0	0	0	0	0
URUGUAY	0	0	0	0	0	0	0	0
VENEZUELA	1	0	0	1	0	0	0	2
Total	**41**	**9**	**12**	**2**	**10**	**11**	**13**	

Notes: Based on (a) dm and mdmh; (b) housesys; (c) theshold change over 1990-2009 ; from columns (d) to (g) change over 1990-2001. (e) sum of columns (a) to (g).

Table A9a

Principal Component Analysis: De-Jure Political Rules with Centripetal effect on EV

Squared Multiple Correlation (SMC)

Constitutional Regime	system	0.24	0.24	0.25	0.25	0.24	0.25	0.19	0.2	0.25	0.26	0.19	0.21	0.14	0.13				
District Magnitude	magn	0.82		0.85		0.86		0.82		0.84		0.86		0.74	0.82	0.74	0.82		
	magn1																	0.67	0.82
	sdm		0.48		0.6		0.48		0.51		0.59		0.52						
Electoral Formula	housesys	0.73	0.65					0.75	0.69					0.73		0.73		0.68	
	maj			0.71	0.63					0.78	0.73								
	pind					0.81						0.83			0.81		0.81		0.81
	pindo						0.54						0.52						
Ballot Structure	list							0.43	0.45	0.56	0.55	0.46	0.39						
	ballot	0.66	0.67	0.66	0.66	0.66	0.67												
	pool	0.74	0.7	0.75	0.59	0.74	0.56	0.73	0.68	0.74	0.57	0.73	0.59						
	vote	0.6	0.62	0.61	0.61	0.61	0.64	0.38	0.38	0.35	0.35	0.35	0.47						
	indexp													0.58	0.56	0.54	0.52	0.55	0.52
PC1: % of explained variance		**0.6**	**0.57**	**0.59**	**0.57**	**0.6**	**0.57**	**0.57**	**0.54**	**0.57**	**0.54**	**0.58**	**0.51**	**0.66**	**0.67**	**0.83**	**0.84**	**0.82**	**0.84**
KMO criterion		**0.76**	**0.76**	**0.72**	**0.77**	**0.76**	**0.78**	**0.79**	**0.79**	**0.71**	**0.78**	**0.79**	**0.76**	**0.72**	**0.71**	**0.72**	**0.7**	**0.73**	**0.7**

Note: Shadowed columns indicate combinations with the highest percentage of explained variance.

Table A9b

Principal Component Analysis: De-jure Political Rules with Centrifugal effect on EV									
Squared Multiple Correlation (SMC)									
Constitutional Regime	pres	0.05	0.06	0.09	0.07	0.1	0.09	0.13	0.1
District Magnitude	mdmh	0.04		0.02		0.04		0.02	
	dm		0.08		0.02		0.08		0.03
Electoral Formula	pr	0.57	0.56	0.03	0.03	0.62	0.61	0.09	0.09
Ballot Structure	list1	0.55	0.57			0.57	0.58		
	cl			0.09	0.06			0.18	0.15
Reform	reform					0.19	0.17	0.19	0.16
PC1: % of explained variance		**0.47**	**0.5**	**0.34**	**0.33**	**0.41**	**0.43**	**0.32**	**0.3**
KMO criterion		**0.55**	**0.59**	**0.54**	**0.53**	**0.53**	**0.57**	**0.53**	**0.48**

Note: Shadowed columns indicate combinations with the highest percentage of explained variance.