8 Public Governance and Sustainable Development

In the last decades, public governance and, particularly, the quality of the rule of law (RoL) became one of the main topics on the international development agenda. Much of this agenda focuses on promoting reforms to strengthen the RoL, with the expectation of removing pernicious incentives and, thus, curbing corruption. Often, such reforms are justified by analysts, NGOs, and multilateral organisations showing evidence of a statistical association between indicators related to the RoL and corruption across countries. That is to say, the pooling of data across countries with very different contexts indicates that better governance strongly correlates with a lower perception of corruption. Following this type of stylised facts, researchers and policymakers often conjecture that if a country can emulate the quality in the RoL of a nation presenting less corruption, its own corruption problem should decrease.

The reality, however, suggests that this line of reasoning is flawed since, despite the numerous governance reforms, around the world, in the last 20 years, reductions in corruption rarely follow such reforms. In fact, in its 2017 World Development Report (titled *Governance and the Law*), the World Bank asserts that legal improvements to the rule of law in many countries have rarely succeeded in achieving drastic reductions in the perception of corruption (World Bank, 2017, pp. 77–79). In the context of sustainable development, it should be self-evident that an ineffective RoL hinders all governments' attempts to reach agendas such as the SDGs. Thus, in this chapter, we study the connections between public funding, the RoL, and multidimensional development.

Baez-Camargo and Passas (2017) propose an explanation for the paradox of having cross-country evidence supporting the previous

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conjecture while observing poor results at the country level. They argue that the ineffectiveness of certain types of reforms to the rule of law originates from inconsistencies between the *de jure* governance and the social norms that guide citizens and public officials. That is to say, traditional analyses, such as fitting regressions to governance indicators, disregard the relevance of systemic effects that hamper the positive incentives elicited by the RoL in specific societies. From a data perspective, this implies that a cross-country correlation between governance indicators and corruption cannot capture within-country experiences. Furthermore, causal inferences from statistical results using aggregate variables are bound to mislead analysts into wrongly motivated policy interventions related to the RoL. Furthermore, since the RoL is not an isolated policy issue, any related reform may yield unexpected impacts if they do not consider complementary interventions in other policy domains.

The challenges behind adopting a systemic perspective in the study of the RoL and development call for alternative analytical frameworks. Thus, we deploy PPI to explain why, in the real world, it is likely to observe a high cross-country correlation between the quality of the RoL and corruption while, at the same time, countries experience modest reductions in corruption when improving indicators related to the RoL. Much of the analysis presented in this chapter is based on our previous work, published in Guerrero and Castañeda (2021a). Nevertheless, here, we develop an updated version of that work as, in this book, we use the latest version of PPI.

We show that isolated improvements to the rule of law do not necessarily generate lower levels of corruption, in the real world, for the following two reasons. First, the *ceteris paribus* condition for other policy issues does not hold because it partly rules out trade-offs emerging when prioritising a large set of policies. Second, co-movements in topics beyond public governance may introduce effects opposing the traditional conduits of anti-corruption policies. In a dynamic world, such correlated changes in non-governance policy issues might boost the net benefit of misbehaving and enhance the

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discretionary use of resources. These complexities generate a rugged policy landscape that governments must navigate cautiously if they wish to implement successful reforms to the RoL. More roughness in this landscape implies that changes in public expenditure devoted to improving the RoL may cause more volatile corruption. Hence, in a rugged policy landscape, governments face more uncertainty than typically suggested by cross-country evidence. By quantifying such roughness, we discover that, unfortunately, less developed countries experience more volatile policy landscapes. This scenario, in turn, explains the dichotomy between cross-country correlations and within-country poor experiences.

8.1 ON THE STUDY OF CORRUPTION AND THE RULE OF LAW

Before proceeding to our analysis, let us provide some context on the study of corruption and the RoL. Through a brief literature review, we aim to familiarise the reader with methodologies commonly used in this field and their limitations. Thus, this overview should make PPI's contribution self-evident, as it attends to analytical challenges that the dominant conceptual and empirical approaches do not tackle properly.

8.1.1 Two Conceptual Frameworks: Principal–Agent versus Systems Thinking

The economics literature conceives corruption as a result of a misalignment of incentives between a principal and an agent. While the former is interested in eliminating corruption, the latter is susceptible to falling into acts of corruption. This approach is the so-called principal agent problem (Rose-Ackerman, 1975; Klitgaard, 1988).[1] Under this conceptual framework, corruption arises from asymmetric information between the agents (i.e., public servants or elected

[1] In most theoretical models in this field, it is commonplace to assume *ceteris paribus* conditions to obtain results. This practice extends to empirical studies that leave aside changes in other policy dimensions.

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officials) and a principal (i.e., government or voters), whose monitoring efforts are imperfect.[2] Consequently, improvements to the RoL should reduce the agents' expected net benefits from embezzling funds and curtail opportunities for the discretionary use of public resources.[3]

Under the principal–agent view of corruption, policy recommendations come down to two principles: reduce opportunities and punish. One of the problems with adopting this view alone is that the systemic properties of corruption are considered irrelevant. This has been pointed out by Persson et al. (2013), who argue for collective action as an account for corruption. In their view, the principal–agent model is ill-suited for explaining corruption because, in many developing countries, no principals are willing to align the agents' interests with long-term societal goals. In such countries, the expectation of corrupt behaviour is widespread, reinforcing pro-corruption incentives. That is, when an individual believes that many others are corrupt, they do not have incentives to act differently. It is important to clarify that, in this scenario, dishonest behaviour is not provoked by a lack of morality, but by a collective memory (or common knowledge) where high levels of corruption are socially tolerable. Because there is a generalised presumption that this is how society works, corruption becomes a collective-action problem.

8.1.2 The Dominant Empirical Approach: Econometrics

The empirical study of corruption is vastly dominated by econometric analyses.[4] Overall, this literature shows consensus on the statistical

[2] A study by Kwon (2014) shows a principal–agent model where reducing discretionary behaviour has ambiguous effects in mitigating corruption.

[3] This scenario occurs when the enforcement of the law increases the probability of catching offenders and when reforms to the RoL – and other public governance mechanisms – reduce the space for the unaccountable management of public funds. In the latter, incentives for proper behaviour are elicited through political competition, while rent-seeking opportunities diminish by fostering economic competition (Ades and Tella, 1997).

[4] Although, in recent years, the public-administration literature has embraced experimental approaches as well (Detkova et al., 2021; Klašnja et al., 2021).

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significance of the RoL in predicting corruption indices. Early studies on the determinants of corruption exploit the cross-national variation of different development indicators through pooled regressions (Ades and Tella, 1997; La Porta et al., 1999; Treisman, 2000; Broadman and Recanatini, 2001; Dollar et al., 2001; Fisman and Gatti, 2002; Leite and Weidmann, 2002; Paldam, 2002; Brunetti and Weder, 2003; Herzfeld and Weiss, 2003; Knack and Azfar, 2003). Overall, these studies conclude that public governance instruments can be effective in the fight against corruption. As the econometric literature has progressed, more sophisticated approaches have appeared to overcome some limitations in these works and to provide a more fine-grained picture of the relevant policy tools.

In studies using Bayesian model averaging,[5] Gnimassoun and Massil (2019) and Jetter and Parmeter (2018) find that some policy variables are robust predictors and, thus, can be utilised by governments attempting to curb corruption in relatively short periods. Some of these predictors include *quality of education*, *female participation in parliament*, *willingness to delegate authority*, *freedom of the press*, *burden of regulation*, *absence of political rights*, *property rights* and *rule of law* (at least in one of the statistical analyses presented). It is important to emphasise that institutional covariates have a prominent role in this set of explanatory variables.

Jetter and Parmeter (2018) apply a variant of the Bayesian model averaging to consider endogeneity in a large set of independent variables, instrumented through their one-decade-lagged values. They find that, out of 32 potential determinants of corruption across 123 countries, 10 are robust. Furthermore, they identify five determinants

[5] This method is employed to deal with model uncertainty. A different approach, however, has been proposed by Serra (2006) via extreme bound analysis. Here, a predictor is considered robust when it remains statistically significant and preserves the same sign in all the models that include such a variable. A less restrictive criterion for a predictor to be defined as robust is that the zero value is not included in the averaged 90% confidence interval of the estimated coefficients (Seldadyo and de Haan, 2006). However, this method is prone to multicollinearity problems due to potential interdependencies among the determinants. Hence, auxiliary techniques are required to cope with this issue.

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with direct policy instruments: *years of primary education*, *trade freedom*, *rule of law*, *federal system*, and *absence of political rights*. Note that the last three are associated with the country's governance framework. Consistent with most cross-sectional studies, the level of economic development (GDP per capita) is also significant.[6]

Using quantile regression to deal with parameter heterogeneity, Billger and Goel (2009) identify that improvements in democracy have a negative relationship with corruption only among the top 50% "most corrupt" nations. In contrast, increments in government size have negligible effects among these same countries. In an alternative strategy, Gnimassoun and Massil (2019) and Jetter and Parmeter (2018) split the sample by geographical region and development status, respectively. The latter authors, for example, find that the RoL is prominent in the Global South. Implying that the effectiveness of legal accountability diminishes once the quality of the RoL has reached a certain level.[7] In this sub-sample, only two of the 11 robust predictors relate to governance (RoL and *absence of political rights*), while two more are associated with some policy instrument (*foreign direct investment* and *government size*).

Despite these efforts, there are still empirical challenges that need to be addressed. Some of these are related to the coarse-grained nature of development-indicator data, while others are concerned with methodological issues inherent to the econometric study of

[6] When causality is considered, *years of primary education* and *GDP per capita* become the two most relevant factors, while the RoL remains robust but less prominent. An alternative methodology dealing with reverse causality and heteroskedasticity is the three-stage least squares used by Croix and Delavallade (2011).

[7] On the one hand, several cross-country studies find that the RoL coefficient is significant (Broadman and Recanatini, 2001; Ali and Isse, 2002; Leite and Weidmann, 2002; Brunetti and Weder, 2003; Herzfeld and Weiss, 2003; Park, 2003; Damania et al., 2004; Croix and Delavallade, 2011; Elbahnasawy and Revier, 2012; Iwasaki and Suzuki, 2012; Mendonça and Fonseca, 2012). On the other hand, several papers find significant coefficients among alternative governance indicators; some related to current policies (e.g., *government effectiveness*, *decentralisation*, *freedom of the press*, *federal system*, or *women in parliament*) and others associated with the origins of the legal system. For extensive reviews on corruption and its economic, institutional and historical determinants, see Jain (2001); Seldadyo (2008, Ch. 5); Pellegrini (2011); Shacklock et al. (2016); and Dimant and Tosato (2018).

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aggregate relationships. We have commented on some of these challenges in Chapter 3, from a general perspective. Let us frame them in the context of the RoL and development. Generally speaking, development indicators do not allow exploiting within-country variation (unless an extremely narrow set of covariates is used). Perhaps the most troublesome problem with econometrics studies is how analysts extrapolate their results to conclusions about the ability of governments to directly manipulate RoL indicators. In other words, scholars and consultants in this field often assume that governments have a direct incidence on the quality of the RoL while, at least in the short term, can only intervene through funding strategies (direct interventions involve structural reforms of a long-term nature). Thus, policy recommendations based on this type of evidence stand on a weak empirical basis since these models do not identify and integrate relevant expenditure programmes and their funding.

A different problem with the empirical literature on this topic is that, while cross-national variation is the dominant factor in its results, they have limited policy interpretations since the estimated coefficients correspond to a hypothetical country with the average characteristics of the sample. Another limitation is that policy indicators are not proper exogenous random variables; instead, they are conscious and strategic decisions made by governments attempting to obtain specific goals (Rodrik, 2012). Thus, the choice of development indicators as explanatory variables might not be appropriate. One more methodological issue arises from the Lucas critique (Lucas, 1976), rejecting the assumption that, under regression analyses, the estimated effects during the sample period will still be valid in an out-of-sample evaluation.[8] For example, given previous evidence on parameter heterogeneity across income groups, a country's estimates

[8] In the neoclassical view, authors commonly argue that only 'deep' parameters (i.e., associated with technology or preferences) can be invariant. Hence, the associated prescription has to be estimated through micro-founded functional relationships. However, several authors have pointed out that such prescriptions come from flawed diagnostics of how complex societies operate (see Colander and Kupers, 2014 for more on this criticism).

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are likely to shift as its economy develops. Hence, intending to overcome some of these challenges, we propose the bottom-up approach embedded in PPI.

8.2 DATA WITH AN ENDOGENOUS RULE OF LAW

We use the same dataset prepared for Chapters 6 and 7. Here, however, we make an important modification: we turn the parameter of the RoL ($\theta_{i,t}$ from Equation 4.2) into an additional development indicator. The source of these data is the same as before (the Worldwide Governance Indicators), but now the data are assumed to have a dynamic nature and an endogenous evolution. The reason to consider $\theta_{i,t}$ as an endogenous variable is to design policy interventions in terms of changes in public expenditure (as opposed to manipulating $\theta_{i,t}$ directly). Thus, in contrast with the regression analyses of economic development, in which $\theta_{i,t}$ is one of the independent variables, we propose the size and allocation of public expenditure as valid exogenous policy instruments. Turning $\theta_{i,t}$ into an endogenous variable also means that it follows the dynamics described in Section 4.2; namely, it depends on the flow of government spending, spillovers, functionaries' learning, and long-term structural constraints. Therefore, we re-estimate the spillover networks and re-calibrate the model for each country.

Next, using the historical data, let us show the paradox that we discussed previously. For each country, we compute the average indicator of the quality of the rule of law (during the sample period) and plot it in the horizontal axis of Figure 8.1a. Then, for the same countries, we calculate the mean Perception of Corruption Index from Transparency International and plot it on the figure's vertical axis. As we can see, the association between these aggregate variables suggests a strong positive correlation (recall that the indicators have been processed so that higher values represent better outcomes). As expected, countries in the *West* group tend to be located in the upper right corner of the panel. Moreover, readers should remember that, when validating the model in Chapter 4, we showed that the synthetic

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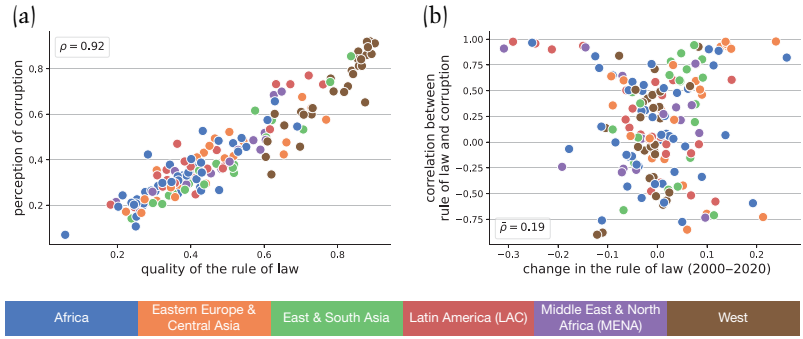


FIGURE 8.1 Association between corruption and public governance. (a) Between countries and (b) within countries.
Notes: In the left panel, the symbol ρ denotes the Spearman correlation across countries. In the right panel, the $\bar{\rho}$ symbol indicates the average–within-country–Spearman correlation.
Sources: Transparency International's Corruption Perception Index. Worldwide Governance Indicators; indicator on the quality of the rule of law. World Bank's data on government final consumption expenditure.

data for inefficiency are consistent with the cross-country evidence about corruption and the RoL.[9]

Now, in these data, we can also observe countries experiencing different changes in the quality of the RoL. Therefore, we calculate the within-country correlation between corruption and the RoL and evaluate whether a positive and large statistic dominates. The vertical axis of Figure 8.1b shows that this scenario does not hold, either when checking the whole spectrum of changes – increments or decrements – in the RoL or only those indicating positive changes. Although there is a sizeable number of country cases in which a correlation above a 0.25 threshold exists, it is common to find low and even negative correlations between these two variables. This result implies that, before controlling for other effects, the data at the country level do not produce the strong correlation observed in cross-country comparisons. Accordingly, from a descriptive analysis

[9] This validation requires assuming that the simulated inefficiencies of government funding describe the relative corruption observed across countries.

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based on the countries' individual experiences, we cannot infer that isolated improvements in the RoL are an effective instrument for abating corruption.[10]

If we want to study whether RoL impinges on a country's corruption levels, it is necessary to move beyond a plain data perspective. On the one hand, many of the countries in the sample do not present historical evidence of substantial increments or reductions in the quality of the RoL for us to infer causal relationships. On the other hand, there are country-specific considerations that we have to control when analysing the impact of an improvement in public governance. Fortunately, with a theoretically informed model, we can produce counterfactual simulations and, hence, study changes in exogenous variables which are not currently present in the dataset. PPI provides such a model, allowing us to disentangle the mechanisms that explain the paradox observed in Figure 8.1 and to understand the reasons why countries in the Global South have difficulties in curbing inefficiencies through interventions aimed at the RoL.

8.3 SIMULATION STRATEGY

With the PPI model, we simulate within-country variation in the level of corruption by exogenously increasing the expenditure dedicated to government programmes with a mandate for improving the RoL. Instead of directly manipulating the associated indicator, we specify a more realistic setting and allow for the endogenous evolution of the RoL. As we have previously argued, in the real world, the indicator of the quality of the RoL is not entirely under the control of the central authority – at least not in the short term. This is so because the quality of public governance, in general, is the reflection of not only institutional features, but also of the joint influence of several other development dimensions. For example, the educational level of the population and its average income can reinforce the efficacy of

[10] Notice that these calculations have been performed with more than 20 years of data, a reasonable amount of time to expect some variation in corruption and the RoL.

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procurement schemes as they contribute to the technical capacity of those implementing them. These improvements can take place when the associated government programmes are well funded.

There are two main reasons why expenditure is a more adequate exogenous variable than development indicators. First, when econometric studies justify a policy prescription, it is assumed that a change in an indicator comes from an equivalent modification in policy priorities. This assumption is unlikely to prevail since spillover effects and long-term structural factors are partially responsible for the indicators' dynamics. In other words, the evolution of governance indicators conflates with a variety of policy dimensions influenced by different government programmes. Thus, increments in expenditure may not necessarily translate into indicator improvements. Second, an opaque mapping between spending and indicators means that more resources to improve the RoL do not necessarily imply less corruption (a common assumption in linear models). Consequently, using the budget as the exogenous variable allows us to account for potential non-linearities and bottlenecks coming from the data-generating process.

We can devise two strategies to implement exogenous changes in government expenditure via simulation. The first consists of increasing the total budget of the government. By doing this, one induces higher success rates in the improvement of most indicators. However, these improvements may be non-linear because the central authority decides how to allocate additional resources.[11] The endogenous reallocation of resources across policy issues is partially shaped by the outcomes observed by the government (e.g., indicator progress and disparities in the efficient use of resources). Overall, one would expect a negative relationship between the size of the budget and the level of corruption if no other policy variable is affected simultaneously.

[11] Remember that it is necessary to let the government agent decide these allocations because, in this study, we lack a one-to-one map between indicators and expenditure programmes.

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The second type of intervention consists of a higher propensity to spend in the RoL while maintaining the same budget size. The theoretical implication here is that increments in expenditure towards the RoL occur at the cost of other policy issues. In this alternative setting, the relationship between more resources and less corruption is less clear than with the first type of intervention. Furthermore, if the RoL is not independent of other policy issues, one should not be surprised to observe more corruption as an outcome of funding the RoL at the cost of other programmes. But, how can we simulate more expenditure in a specific policy issue if we only have data on the total budget? To answer this, let us recall Equation 4.10, which is $\dot{q}_{i,t} = \left(\frac{q_{i,t}}{\sum_j q_{j,t}}\right)^{b_i}$. Remember that the modulating factor b_i is set to 1 by default but could be modified exogenously to induce – in the central authority – a higher propensity $\dot{q}_{i,t}$ to spend in a specific policy issue i. Thus, in this study, we exploit this feature of the model to 'nudge' the government agent to spend more on the RoL than on other policy issues (given a fixed budget size).

To generate a measure of corruption from the model, we calculate the total amount of embezzled resources during a simulation that lasts T periods (i.e., simulation steps). We divide this number by the total budget B to quantify corruption as a fraction of the government's expenditure. That is, for a single simulation m, we quantify corruption as

$$D_m = \frac{\sum_i^n \sum_t^T (P_{i,t,m} - C_{i,t,m})}{B_m}. \tag{8.1}$$

Then, we perform M independent Monte Carlo simulations to obtain the expected level of aggregate corruption across multiple realisations of the model according to

$$\bar{D} = \frac{1}{M} \sum_m^M D_m. \tag{8.2}$$

While $\bar{D}$ offers a measure of corruption produced by the model, it should not be interpreted as a precise quantitative estimate of the actual amount of embezzled resources in a country during a specific

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period. Instead, it should be understood qualitatively in so far as it only describes a non-linear relationship between expenditure and corruption. We cannot provide point estimates of corruption because the factual probability of spotting embezzlement is not necessarily equal to that described in Equation 4.4, while $\tau_{i,t}$ does not necessarily describe the true cost of a penalty when public servants misbehave. Instead, $\bar{D}$ should be seen as a relative metric that is consistent with an empirical index on the perception of corruption for a large set of countries, as shown in Figure 5.3b.

8.4 RESULTS OF COUNTERFACTUAL ANALYSES

We divide our analysis into two parts. First, we simulate policy interventions of types 1 and 2 independently of each other. That is to say, we increase the total budget without exogenously manipulating the resources destined for the RoL to the detriment of other policy issues. Conversely, for type 2 interventions, we induce a higher propensity to prioritise the RoL over the other indicators but do not change the total amount of public expenditure. In the second part of our analysis, we combine the two types of interventions to estimate their joint effects. Then, we characterise their impacts through surface plots that represent how sensitive is the level of corruption to these combined interventions. This exercise is important because, in the real world, the expenditure allocations reflect policy priorities established in a dynamic policy landscape where development indicators keep changing. A smoother policy landscape should facilitate the achievement of corruption-curbing objectives through a proper selection of fiscal policies. Thus, we propose a method to quantify the roughness of this policy landscape and provide novel results.

8.4.1 Non-linear Responses to Expenditure in the Rule of Law

First, let us look at the relationship between expenditure in the RoL and corruption under each type of intervention, independently of each other. In Figure 8.2, we provide six examples of response

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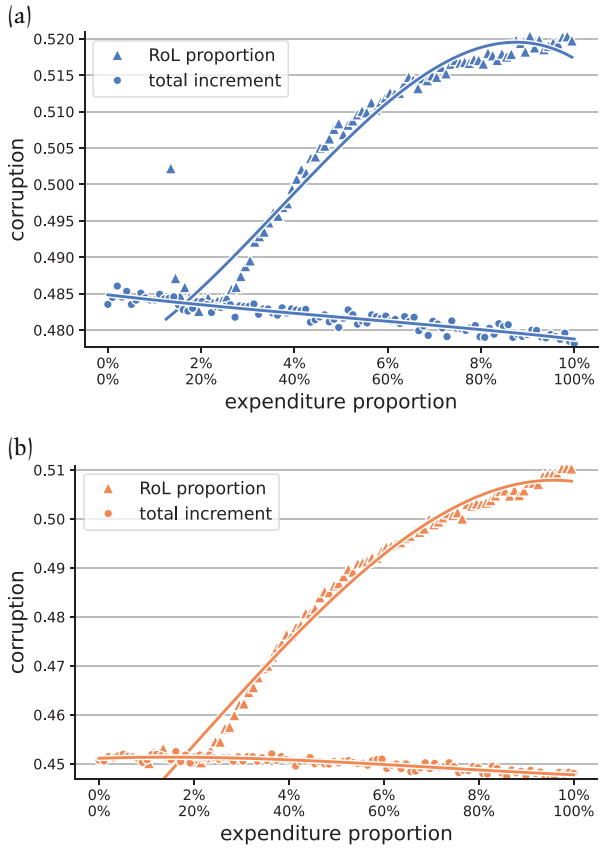


FIGURE 8.2 Six cases of within-country sensitivity to expenditure in the rule of law. (a) Tanzania, (b) Turkey, (c) China, (d) Peru, (e) Qatar, and (f) Sweden.

Notes: The horizontal axis in each panel denotes two different units. The bottom units correspond to the percentage of budgetary growth simulated in a type 1 intervention (circular markers). The top units correspond to the fraction of expenditure devoted to the quality of the rule of law under a fixed budget size, i.e., type 2 intervention (triangular markers).

Sources: Authors' calculations.

functions to each intervention. Type 1 is denoted by circular markers (bottom line), while type 2 corresponds to the triangular markers (upper curve). Here, we simulate counterfactual increments of the total budget from 0% to 100%. Notice that, for all countries, there is a negative relationship between the budget size and the proportion

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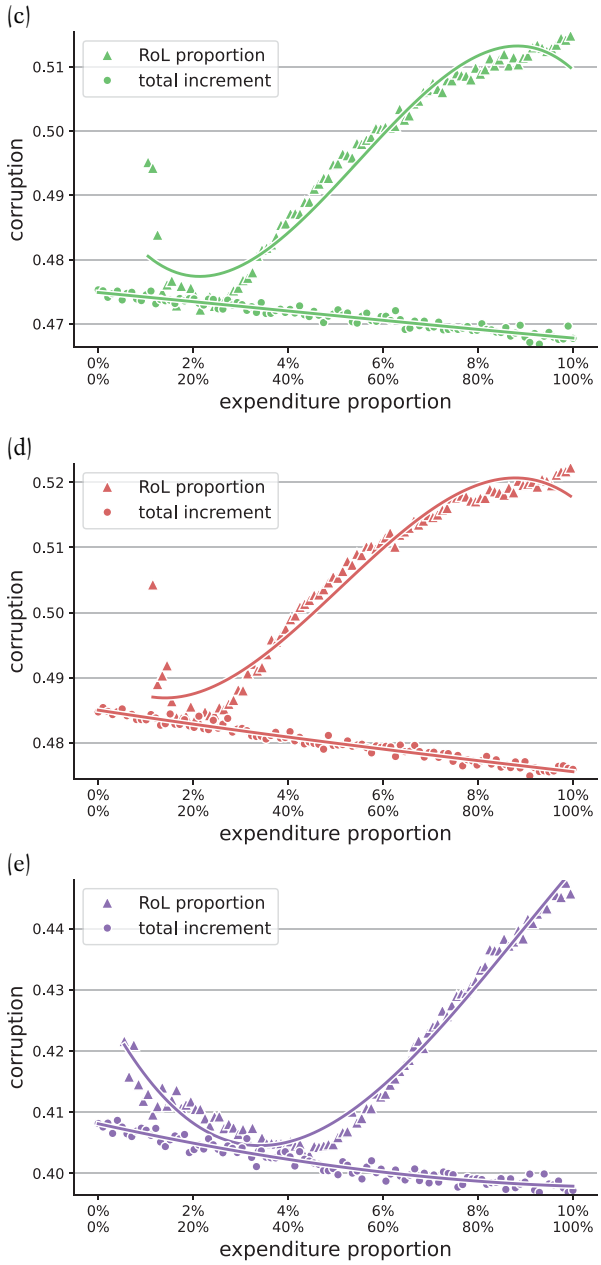


FIGURE 8.2 *(cont)*

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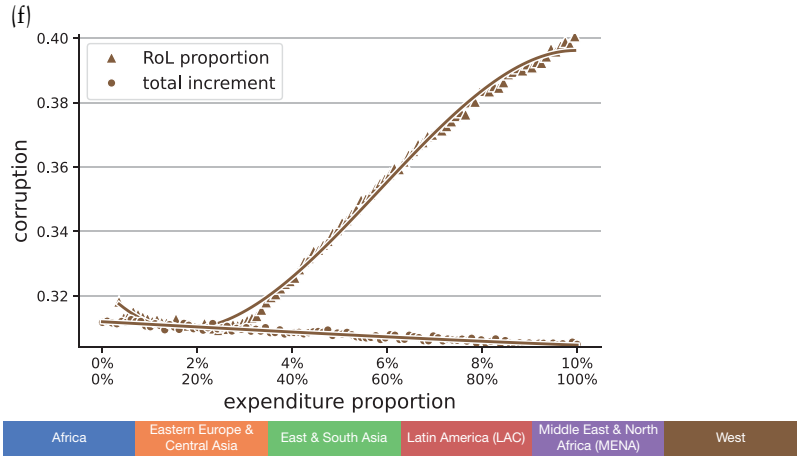


FIGURE 8.2 *(cont)*

of embezzled resources (or wasted resources due to inefficiencies); although, the slope of the fitted line varies slightly between countries. For instance, China, Peru, Qatar and Sweden exhibit the steepest slopes, indicating some sensitivity of corruption to interventions that involve changes to total expenditure. Presumably, development boosted by an enlarged budget (including an improvement in the quality of RoL) might increase embezzlement in absolute terms but reduces corruption when measured in relative terms. In contrast, Tanzania and Turkey present a more inelastic response across changes in budget size.

Interventions of type 2 consist of exogenously varying b_i to generate expenditure proportions ranging between 1 and 10% (we consider that more than 10% of the total budget would be an unrealistic level of expenditure in the RoL). Looking at the curve fitted to the triangular markers, one notices a nonlinear relationship between the two variables. This result suggests that reallocating public funds from other issues to programmes associated with RoL can generate pay-offs, in terms of curbing corruption, up to a certain point. After a threshold has been crossed, lack of funding for other issues and systemic effects produce an increase in the relative size of corruption, whether the RoL improves or not. Turkey and Qatar are examples of opposite cases.

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In Turkey, changes in the proportion of expenditure devoted to RoL programmes produce marginal impacts on corruption before reaching the threshold. In Qatar, the pre-threshold impacts are more notorious.

A clarification is in order. In the real world, governments perform both types of interventions simultaneously. This is the case because budgets tend to grow over time, and policy priorities (expenditure allocations) also change. Most importantly, depending on the budget size and the relative expenditure in agencies monitoring and enforcing the RoL, the joint implementation of these interventions could produce impacts in any direction (more or less corruption). Directional changes in corruption are manageable when a 'smooth' gradient helps governments avoid unexpected outcomes. However, this ideal scenario is not always observable in real-world settings. Therefore, we need to understand how rough or smooth are these policy landscapes. With that aim, it is necessary to simulate joint policy interventions and quantify the roughness of the response functions, as done in the following subsection.

8.4.2 Rugged Policy Landscapes

Let us show the policy landscapes that six governments would face when trying to improve the RoL through different combinations of type 1 and 2 interventions. In Figure 8.3 we show these illustrative cases. The first thing to notice is that, for low levels of relative expenditure on the RoL, the surface tends to be quite rugged across all increments of the overall budget (e.g., in China, Peru, and Qatar). However, a smoother surface emerges when relative expenditure surpasses a certain threshold in these countries. Nevertheless, several spikes and cavities remain in the upper area of these landscapes. These features beg the question of how a government could navigate the lower segments of these surfaces through fiscal policies, especially when agencies in charge of public governance have scant public funds.

The policy landscapes described by the surface plots in Figure 8.3 give us an idea of how difficult it would be for a government to find the right combination of budgetary growth and the relative

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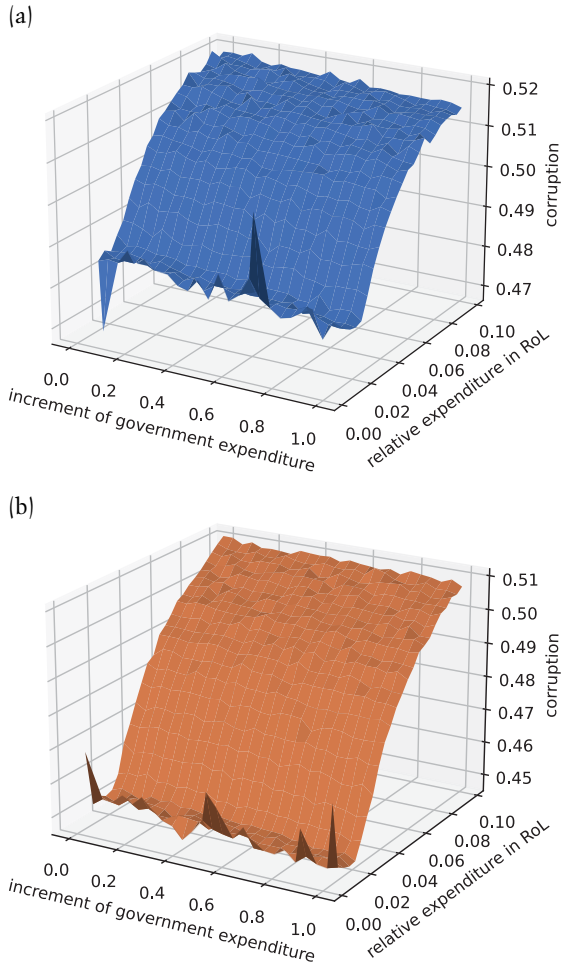


FIGURE 8.3 Policy surfaces of six countries. (a) Tanzania, (b) Turkey, (c) China, (d) Peru, (e) Qatar, and (f) Sweden.
Notes: The horizontal axes indicate expenditure policies of type 1 (left axis) and type 2 (right axis), which we simulate jointly in this setting.
Sources: Authors' calculations.

allocation of resources to the RoL. More roughness on the surface makes it harder to navigate since marginal changes in both types of interventions could generate spikes in corruption. From eyeballing our six examples, we can see the remarkable difference in smoothness

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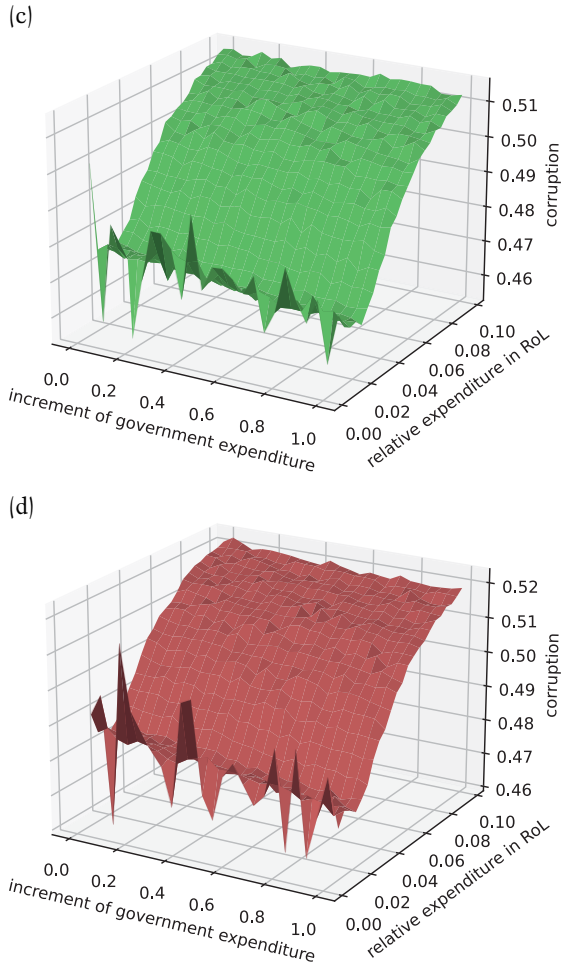


FIGURE 8.3 *(cont)*

between Sweden and the rest of the countries. Moreover, the non-linear behaviour of these surfaces makes clear that type 2 interventions tend to have stronger impacts than type 1. This visualisation leads us to hypothesise whether there is a systematic relationship between the roughness of a policy landscape and the level of development of countries. Is it the case that more developed nations tend to experience smoother policy landscapes? If so, realising initiatives

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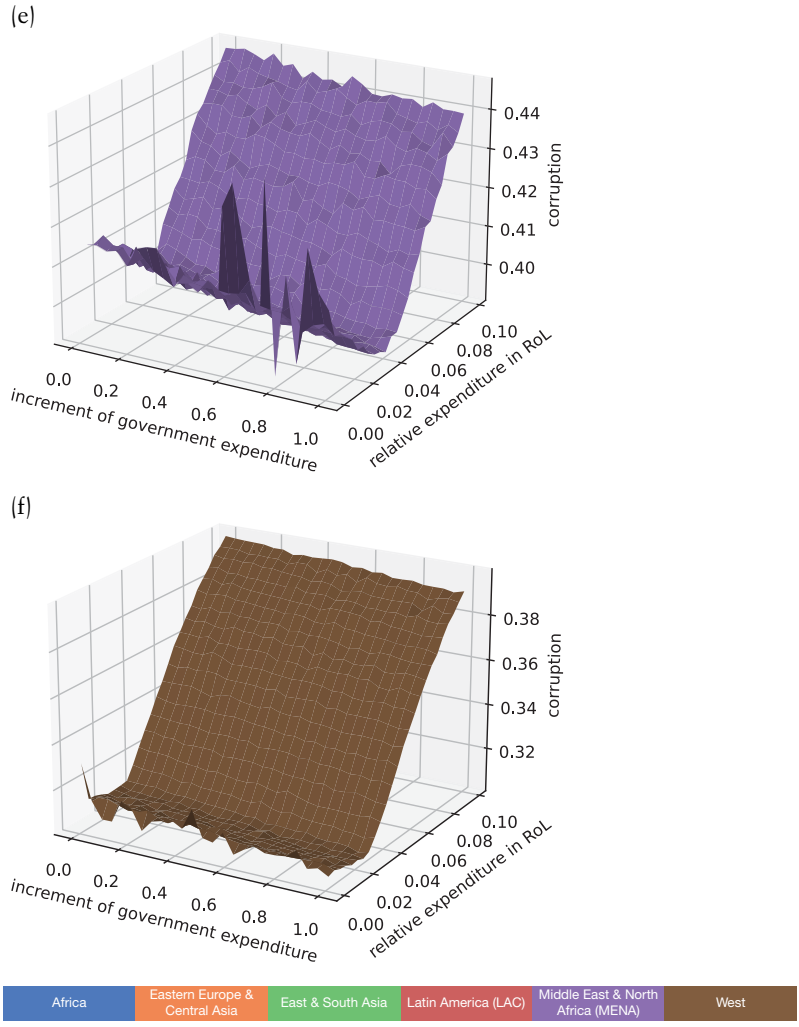


FIGURE 8.3 *(cont)*

such as the Good Governance Agenda may prove more difficult than originally thought.

To quantify the roughness of a surface, we employ a technique called 'bi-variate cubic spline'. Splines are an interpolation method that aims at connecting data points by fitting a sequence of polynomial functions, in this case, cubic polynomials that take two

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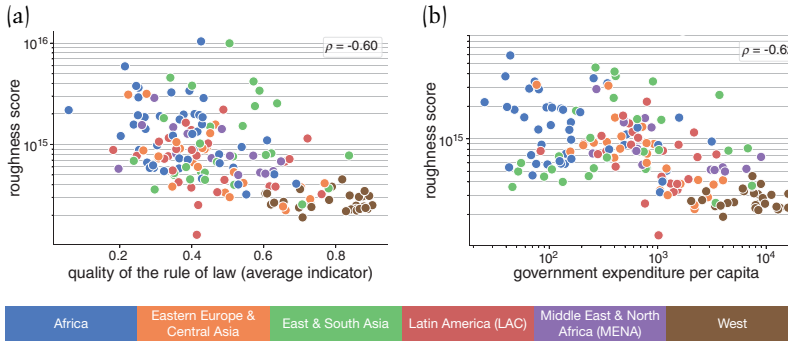


FIGURE 8.4 Roughness scores of the policy surfaces and their association with development. (a) With the rule of law and (b) with expenditure per capita.

Notes: Symbol ρ denotes the Spearman correlation. Some axes in the plots are presented in logarithmic scales to show outlier values.

Sources: Authors' calculations.

inputs (each type of intervention) and return an interpolated level of corruption. In essence, we are trying to wireframe the policy landscape by connecting the different points on the surface through these polynomial functions. The technical details on how this is achieved are beyond the scope of this book (see Guerrero and Castañeda, 2021a). What is important is that, once the spline has been fitted, the sum of the second derivatives of the polynomials provides a measure of how rugged is the wired surface. Thus, this method provides a reliable metric to evaluate how difficult it would be for a government to navigate its policy landscape. A higher roughness metric means that the policy landscape is more rugged; hence, avoiding spikes that suddenly increment corruption becomes more challenging when reallocating government funds. Once we compute the roughness metric, we investigate if there is a systematic relationship with the level of development of countries across the entire sample.

In Figure 8.4, we plot the roughness score against two variables that correlate with the level of development of countries: the quality of the rule of law and government expenditure per capita.[12] First,

[12] In Guerrero and Castañeda (2021a), we use alternative variables and obtain similar results.

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the advanced economies of the West (brown dots) tend to present smoother policy landscapes, enabling a potential virtuous cycle of improved development and reinforced RoL. Second, overall, both charts exhibit a significant and negative relationship, meaning that there is a systematic relationship between how developed a country is and how difficult it is to avoid undesirable outcomes when trying to improve the rule of law. This result suggests that the worse the country's performance, the easier to remain in a poverty trap, as it becomes more cumbersome to realise successful institutional changes. For instance, many African countries are in the worse region of the development-roughness space; thus, they can hardly find a successful allocation profile. Nonetheless, if their governments have the will and the necessary political capital, it is possible to produce a sufficiently large reallocation of resources to boost RoL for curbing corruption.

8.5 SUMMARY AND CONCLUSIONS

To detect an empirical connection between government spending and the SDGs, it is necessary to establish how much government resources are detoured for the personal gain of public functionaries or lost due to poor management and inadequate infrastructure. These inefficiencies shadow the potential impact of budgetary allocations since they produce *de facto* underfunding of government programmes. The size of such a loss of public funds is not trivial in real economies, as indicated in estimations for Latin American countries presented in Izquierdo et al. (2018). Therefore, through PPI, we elaborate a theoretical framework that considers the existence of these inefficiencies and allows us to infer how their relative importance changes as a result of modifications in the RoL or other measurements of public governance.

Through our ABM, we analyse the sensitivity of corruption to changes in the overall government budget and the participation of government programmes dedicated to enforcing the RoL. Our counterfactual simulations offer a more realistic picture of policymaking.

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On the one hand, no policy is implemented in isolation. On the other hand, expenditure – and not the quality of RoL – is the true-exogenous instrument that governments can directly intervene on a short and mid-term basis (unlike indicators, which in real life reflect outcomes). Furthermore, the model allows within-country analyses that appeal to the fact that context matters. In contrast, cross-country estimations indicate a negative relationship between corruption and the quality of RoL. Paradoxically, the latter pattern is inconsistent with the experience of governance reforms in many countries.

Two main results emerge from these simulations. First, the policy landscape is a good approximation of the impact of corruption (or inefficiencies in general) for different combinations of budget size and expenditure allocation in RoL programmes. However, it is not easy to navigate the policy space in practice since it is non-linear and rugged. In other words, its roughness implies that governments can have difficulties selecting the most attractive combination of policy instruments. Unfortunately, hikes in corruption may emerge from well-intended investments aiming at improving public governance. Accordingly, our results also suggest that the allocation of funding, more than increments in the budget size, tends to be a better alternative for many countries. Second, when looking at all the countries in the sample, these landscapes exhibit a relatively high degree of roughness among less developed countries, especially in Africa. In other words, laggard countries with the need to improve the RoL more urgently are subjected to more difficulties in finding the right mix of interventions, at least in terms of expenditure policies.

This chapter provides the first quantification of the RoL policy landscape. In doing so, it conciliates an intriguing empirical paradox in the literature, explaining why corruption decays with RoL in a cross-country setting while the within-country evidence of such decay is poor. In terms of policymaking, these results portray a gloomy perspective of initiatives promoting a governance agenda. Overall, researchers and policymakers could use this framework to further investigate, for example, how government can succeed in

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curbing corruption by complementing expenditure in the RoL with strategic investments in other complementary issues. We briefly cover this issue in Guerrero and Castañeda (2021a) and, in terms of development accelerators, in Chapter 11. Likewise, public governance affects the effectiveness of government expenditure and that of extra-government policy actors such as international organisations and aid donors. In the context of international aid, researchers use the term *fungibility* to describe the diversion of resources for purposes other than those originally intended. Thus, in the next chapter, we deploy PPI to open up the black box of aid effectiveness.

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