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Small Is Beautiful, at Least in High-Income Democracies

The Distribution of Policy-Making Responsibility, Electoral Accountability, and Incentives for Rent Extraction

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Abstract

Why is there significant variation in rent extraction among high-income democracies? A large number of political economy investigations into this research question have found that a long period of democratic rule and high per capita income are associated with less rent extraction among public policy-makers. However, attempts to explain the residual, yet significant, variation in rent extraction among countries that possess both these characteristics have been significantly more circumspect and disputed.

This paper explores how the distribution of policy-making responsibilities between electorally accountable decision-makers and their electorally unaccountable public policy-making counterparts determines the optimal level of rents extracted in any given high-income democracy context. Specifically, the paper formally models how: (1) variation in the ratio of electorally accountable decision-makers to electorally unaccountable decision-makers, by altering (2) voters' evaluation of incumbent competency, changes (3) the incentives that policy-makers, wishing to remain in office, have to minimize their short-term level of rent extraction in order to signal their competency and hopefully retain office. Given these "career concerns," the theoretical model predicts that an increase or decrease in the ratio will be associated with more or less rent extraction. This hypothesis is then tested empirically.

Establishing that the ratio does robustly predict variation in rent extraction is a significant finding, as it can enable analysts to predict how changes in policy-making contexts may affect the incentives for good governance in this sub-set of countries.

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Small Is Beautiful, at Least in High-Income Democracies: The Distribution of Policy-Making Responsibility, Electoral Accountability, and Incentives for Rent Extraction

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Sector Board: Public Sector Governance (PSM)

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Introduction

Why does the incidence of rent extraction among public policy-makers persist, even in stable high-income democratic contexts in which regular elections give voters an opportunity to select senior public policy-makers? Furthermore, why is there significant variation in the perceived incidence of this phenomenon within this sub-set of countries? Can this variation be explained by differences in the nature of the policy-making context, which conditions the ability of voters to incentivize and/or select rent-minimizing policy-makers?

The conditions under which (1) the misuse of public office for private gain (corruption), as well as (2) the manipulation of laws and regulations in order to extort from, or curry favor with, interest groups (rent seeking and rent extraction) become more or less likely, is now the primary motivating objective of a large portion of the positive political economy literature focused on the determinants of good governance. Underpinning much of this literature are two critical and inter-dependent assumptions. Namely, (1) that the ideal preferences of voters (principals-who favor rent minimization) and public policy-makers (agents-who favor rent maximization) may, under certain conditions, diverge; and therefore (2), if agents have some discretionary power then they may have an incentive to exploit this in order to further their own (private) interests at the expense of the interests of voters.

Despite the multiplicity of ways in which public officials may abuse their powers, the consequences of their actions, with respect to the welfare of voters, is usually adverse. This is mainly due to: (1) the fact that voter priorities (lower taxes, efficient delivery of publicly-financed services) may not be the priority of deviating agents (higher taxes and the diversion of money from the delivery of public services); and (2) the transaction costs associated with such agent preferred activities (resources devoted to lobbying, navigating regulations, coping with market distortions) that may result in the generation of societal deadweight costs[2]. Thus, *rent extraction,* which is the shorthand term used in the rest of this paper to describe all these varied ways in which agents can abuse their discretion, can have potentially substantial consequences for the welfare of the general public. Therefore, marginal reductions in the incentives of office-holders to pursue rent extraction can result in improved voter welfare.

Although the potentially devastating implications of rent extraction have long been documented (see Muller 2003, pp. 333-358 for a review), it has only been in very recent years, with the proliferation of new methods for measuring the incidence of this phenomenon,[3] that theories regarding the determinants of rent extraction have actually been made subject to increasingly rigorous empirical hypothesis testing. While by no means unanimous in their conclusions, the consensus findings of this empirical literature is that the following macro-level characteristics of a polity are robust predictors of a reduced incidence of rent extraction: (1) a long experience of democratic elections and a free press; (2) a relatively high level of socio-economic development; and, to a lesser extent, (3) a long history of openness to trade[4]. While these findings are extremely useful in

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[2] Readers interested in the distinction between corruption and rent seeking should consult Lambsdorff (2005). Readers interested in the distinction between rent-seeking (public policy officials respond to the incentives provided by interest groups) and rent extraction (interest groups respond to the incentives provided by policy officials) see McChesney (1997). There is a huge literature on the dynamic costs of rent seeking (Tullock rectangle), and one recent estimate puts the costs of rent seeking in Western Europe at 7% of GDP (Angelopoulos et al, 2009).

[3] The first comparative and systematic data on the level of political corruption and rents and corruption was compiled by PRS Group beginning in 1986. Other prominent measures include Transparency International's 'Corruption Perceptions Index'- begun in 1995- (data beginning 2011) and the World Bank's Graft indicator-begun in 1998- (2011).

[4] See Treisman (2007) for an extensive review and testing of the theories on the determinants of rents and rent extraction. Seldadyo and de Haan (2005), Alt and Lassen (2008), also find several other variables as being very robust in explaining reduced (-) or increased (+) the incidence of rent extraction–namely population density (-), Scandinavian legal origin (-) and ethnic conflict (+) and to a lesser extent literacy (+), primary school enrolment (+), public sector salaries (+), dependence on fuel exports (-), parliamentary form of government (+) and female labour force participation (+). In their study of US states Maxwell and Winters (2004) find that the size of government (+), population size (+), social homogeneity (-) and citizen education and engagement (-) are robust predictors of rent extraction. Glaeser and Saks (2006) using Maxwell and Winters data (2004) but with a less 'noisy' identification strategy find that historical income (-), education (-), income inequality (+) and racial heterogeneity (+) are robust determinants of rent extraction.

explaining the variation in rent extraction up to a point, especially between (1) less and more economically developed countries and (2) mature democracies and non-democracies, they fail to account for why there also appears to be significant and persistent variation in the level of rent extraction within stable high-income democracies (Persson et al 2003; Kaufmann et al 2010).

This paper hopes to contribute towards an explanation of these empirical regularities by developing and testing a new contextually enriched career concerns model of the political economy of public policy-making. This objective is achieved by combining several insights from existing, but disparate, works in tangential fields. Specifically, by bringing together: (1) the substantive enrichment of voters' utility function to take into account how contextual factors (namely the distribution of policy-making responsibility between electorally accountable and electorally unaccountable policy-makers) affect the ability of voters to determine the competency of incumbents (Duch and Stevenson 2008); and (2) nesting this decision-theoretic framework into a career concerns game theoretic modeling framework (based on Persson and Tabellini, 2000). It becomes possible to derive the full equilibrium effects of changes in voters' contextually determined capacity to evaluate incumbents' competency. That is, this enriched theoretical model enables the derivation of how incumbent policy-makers strategically react to contextually induced changes in voter evaluation capacity. This result therefore facilitates the possibility of (3) developing and testing new predictions as to how different contexts (distributions of policy-making responsibility) can alter the incentives that incumbent policy-makers have to engage in more or less rent extraction. This paper therefore, follows the pioneering logic[5] of Tavits (2008) who first tried to apply the insights of the economic voting literature to the issue of rent extraction. However, by formally combining these two literatures and focusing on the role of the distribution of policy-making, it goes considerably further in developing more specific and new hypotheses linking context, voters, and the incentives of incumbents to variation in rents.

Recent Advances in the Economic Voting Literature: The EDD/NEDD Ratio and Its Theoretical Underpinnings

One recent contribution to the economic voting literature is the Duch-Stevenson (2008) model of contextual economic voting. Like its clarity of responsibility precursors[6], this model is focused on explaining how contextual factors (the nature of economic policy-making, government formation and operation) condition the economic vote (the ability of voters to identify the contribution of an incumbent to economic outcomes- such as the rate inflation, unemployment, and economic growth). Specifically, in the baseline Duch-Stevenson model, which builds on the seminal work of Alesina and Rosenthal (1995), voters wish to elect/retain incumbents who are perceived as being competent. In this model, economic outcomes are the function of two factors: the competency of the incumbent and exogenous shocks to the economy. Voters are only able to observe the 'equilibrium outcome' of these two factors. However, while voters cannot observe the individual action of incumbents, they do know the variance of both the competency distribution from which incumbents are drawn, as well as the variance distribution of exogenous shocks. As such, voters are able to solve a well-defined signal extraction problem that produces a competency signal.

This theoretical framework enables the Duch-Stevenson model to derive very specific hypotheses regarding the conditions under which voters will be more/less able to extract a signal of the incumbents' competency, which would then determine the magnitude of the economic vote. Generically, the Duch-Stevenson model anticipates that (1) as the variance of exogenous factors (determined by contextual parameters) increases/decreases relative to the variance of the competency of incumbents; (2) rational voters will be less/more able to deduce the competency of the incumbent; and hence (3) the magnitude of retrospective evaluation (economic vote) will decrease/increase.

In order to operationalize and test these implications of the model, Duch and Stevenson (2008, pp.129-140) introduce two critical actor's involved in policy-making: Electorally Dependent Decision (EDDs) makers, 'comprising the national government and the bureaucracy that is responsible to them' (ibid, p.139); and non-electorally dependent decision-makers (NEDDs), which is 'everyone else, whose decisions might impact the

[5] Albeit not one that was formalized.

[6] The seminal contribution being Powell and Whitten (1993).

economy, including individuals, firms, interest groups, non-electorally dependent (entrenched) bureaucrats, foreign leaders, the WTO and more' (ibid, pp.139-140). It is important to note that while many scholars before Duch and Stevenson had tacitly examined the political economy outcomes of different ratios of elected and unelected actors (e.g. Cameron, 1978; Katzenstein, 1985; Rodrik, 1998) the explicit formalization of this ratio was first undertaken by Duch and Stevenson. The ratio of EDDs/NEDDs has clear testable implications within the competency model proposed by Duch and Stevenson. Namely, as the ratio of EDDs/NEDDS increases/decreases, the competency/exogenous shocks variance increases/decreases, thereby increasing/decreasing altering the competency signal voters receive, and hence increasing/decreasing the magnitude of the economic vote.

Duch and Stevenson (ibid, pp.131-209, 287-336) show that the EDD/NEDD ratio, as well as the way it interacts with electoral institutions (which affect voters' strategic considerations) is used by voters to deduce the competency of elected officials and is robustly associated with the magnitude of the economic vote in the manner anticipated by the theory. Therefore the EDD/NEDD ratio provides a potentially useful independent variable of interest that can predict the magnitude of retrospective evaluation of incumbents; not just for economic policy but also, possibly, for rent extraction.

Before introducing the formal modeling framework, it is essential to outline how the use of the EDD/NEDD ratio, in trying to account for variation in rent extraction, differs from its original use by Duch and Stevenson (2008). Like the original Duch-Stevenson model, the theoretical framework proposed, enriches rational voters' utility function to take into account context (the EDD/NEDD ratio) and thus anticipate voters' ability to identify the competency of the incumbent. However, the theoretical framework differs in one critical respect: that, like most of the classical political economy literature, it is concerned with the 'full equilibrium' or *strategic effects* of context on the voter-incumbent dynamic. That is, it is concerned with analyzing how changes in voter evaluation affect not only voter action, but also incumbent reactions. Thus, while the Duch-Stevenson model is decision-theoretic (concerned with showing how context influences the ability of voters to infer the competency of an incumbent), the proposed model goes a step further and examines not only how context influences voters, but how this then influences incumbents who anticipate the behavior of voters.

This theoretical extension builds naturally from the principal-agent (P-A) assumptions in much of the political economy literature[7]. Using a game theoretic rather than a decision theoretic approach has an important effect on the hypotheses derived, as well as their operationalization and subsequent testing. Given that most of the relevant P-A games are sequential – that is, the players move in turns – the most common solution concept used to solve such games is backward induction. This requires that the first player condition her actions by 'looking down the decision tree' and anticipating the consequences of her behavior on the actions of the second player. In the case of rent extraction, EDDs officials are hypothesized to set their level of rent extraction before the election, to take into account how increments in rents will adversely affect their re-election prospects (voter reaction in the second stage). Therefore, this context (EDD/NEDD ratio) determines the ratio of policy-makers who face this dilemma or are otherwise insulated from the electoral cost of rent extraction (NEDDs). It is therefore possible to develop specific predictions about how variation in the EDD/NEDD ratio will incentivize policy-makers in anticipation of voters' reactions.

Specifically, this game theoretic set-up enables the derivation of two distinct hypotheses. Firstly, EDD policy-makers will be more reluctant to engage in rent extraction versus insulated policy-makers (although this result will only hold in democratic contexts); secondly, perception of rent extraction among voters regarding the overall level of 'political' rent extraction, will vary with the EDD/NEDD ratio (as a higher EDD/NEDD ratio will incentivize more policy-makers to desist from rent extraction in order to secure re-election). This two-stage test is a logical extension of the original focus of the Duch-Stevenson (ibid) and economic voting literature in general, and of the impact of context on the magnitude of voter reaction to incumbent behavior.

Ideally, it would also have been good if the operationalization and testing of the 'voter component' of the hypotheses derived by the model occurred in the same manner as Duch and Stevenson's (2008) formalization. That is, using individual level survey data of voter perceptions of rent extraction before and after an election. However, due to the limited reliability of over time variation in perceptions of rent extraction noted

[7] See Besley, (2006) for an introduction to the use of P-A in political economy analysis.

above, a cross-sectional identification strategy is used instead. Specifically, this strategy entails a two-stage test. Namely, (1) examining whether elite behavior is perceived as varying with the EDD/NEDD ratio (only in democratic contexts; strategic behavior of incumbents in the first stage); and (2) seeing whether voter perceptions of rent extraction are also predicted by variation in the EDD/NEDD ratio (anticipated behavior of voters in the second stage). In order to realize this objective the rest of this paper is divided as follows (1) The next section develops the theoretical framework and derives the testable hypotheses described above, and (2) the subsequent section tests these hypotheses using data. The paper concludes with a critical appraisal of the model, its empirical testing and avenues for future research.

The Model

This paper uses a career concerns modeling framework (adapted from Persson and Tabellini, 2000, pp.81-85) to evaluate the game-theoretic implications of the originally decision-theoretic DSM. This modeling approach is particularly useful because its 'hybrid' assumptions mean that it can address both issues of: (1) selection (office holders have different competency levels); and (2) moral hazard considerations. It is thus consistent with the selection-based assumptions of the DSM but does not have to ignore the possibility of moral hazard; and therefore, the growing corpus of work that suggests that both selection and moral hazard considerations exist simultaneously (Alt et al, 2011, pp.171-172).

The generic career concerns model shows how the existence of elections (potentially) alters the behavior of incumbent office holders. The critical assumption of the model is that, initially, both voters and incumbents are not aware of the latter's competency (defined as the ability to generate publicly financed goods efficiently). As publicly financed goods are a residual outcome, once an incumbent has expropriated tax resources for the purpose of rent extraction, the model predict that: (1) if incumbents value remaining in office and there is a good expected probability that they are of average or higher competency and; (2) voters can credibly commit to re-electing average or high competency incumbents[8]; then incumbents will desist from rent extraction in the short run in order to demonstrate their competency and secure re-election. By modifying this generic career concerned model to take into account the fact that, even when elections exist, not all policy-makers are subject to their effect (the DSM distinction between EDDs and NEDDs- Duch and Stevenson, 2008, pp.139-141) it becomes possible to generate more nuanced predictions about how changes in the nature of public policy-making can alter the efficacy of elections in creating incentives to reduce rent extraction.

For the sake of notational simplicity the model presented below assumes that there is no alternative mechanism for incentivizing reduced rent extraction. In reality such mechanisms exist and, to varying degrees, may incentivize rent minimization among NEDD policy-makers (e.g. selection mechanisms, peer review, direct monitoring etc.[9]). As Appendix B shows the existence of such mechanisms does not generally affect the qualitative insights of the basic model- that elections can more effectively incentivize rent minimization among EDDS vs. NEDDS in the short run. In fact only when such non-electoral mechanisms are perfect at aligning the incentives of NEDDs and voters will the incentives for NEDDs and EDDs be the same (an outcome that is empirically unlikely to occur on a regular basis). As the empirical section will show controlling for the effect of alternative, non-electoral, mechanisms for rent-minimization does not alter the empirical robustness of the theoretical framework.

[8] It is important to note that voters are better off in the second period with a high competency rent-maximizing incumbent, as even though rent extraction is high, more publicly-financed goods are still generated.

[9] Indeed a large literature emanating from early work on legislative-bureaucratic oversight (Mcnaugust et al 1978) has grown suggesting that unelected officials face a variety of incentives not to deviate from the preferences of their principals- see for example Horn (1995).

A Simple Extension of the Generic Career Concerns Model[10]

Consider a two period game (t=1,2) in which: (1) nature randomly assigns, from the same competency distribution, an: (a) an EDD and; (b) NEDD; to public office in the first period. Each policy-maker is responsible for undertaking a distinct proportion of public policy decisions. This distribution of decisions is exogenous, fixed over the two periods, and common knowledge to all players; (2) voters can credibly commit to a re-election rule. Specifically, voters can commit to re-elect the incumbent EDD if she is of average or above average competency (for a second period) or to elect a new EDD, drawn from the same distribution, and hence an average expected competency, if the incumbent is of below average competency. In the second period policy-making decisions are made by the: (a) re-elected incumbent EDD or the newly elected EDD and; (b) the NEDD (assigned by nature in the first period).

For simplicity it is assumed: (1) that taxes, τ, are fixed at $\bar{\tau}$ and the government budget has to be balanced in both periods (t=1,2); (2) rents, r, are non-negative but their upper bound is less than the available tax revenue; that is, $r_1 \leq \bar{r} < \bar{\tau}y$; (3) all actors have the same discount factor δ ($0 < \delta < 1$); and (4) public policy-makers cannot credibly commit to specific policies before an election.

Voter (i') utility in both periods, w_{it}, is a function of: (a) publicly financed goods and services, g_t; and (b) their post-tax income $y(1-\bar{\tau})$; the specific desirability of public to private consumption is exogenously determined by a parameter $\lambda \geq 1$ and, for simplicity, it is assumed that voter's marginal utility from public goods consumption is constant. Thus, voters' welfare is determined by:

$$w_{it} = y(1-\bar{\tau}) + \lambda g_t \tag{1.01}$$

As noted above public policy-making is assumed to be the product of the aggregation of decisions made by EDDs and NEDDs and is limited by the exogenously determined level of taxation and distribution of policy-making decisions. Formally, define A as the aggregate number of consequential policy-making decisions undertaken by EDDs and let B be the aggregate number of consequential decisions made by NEDDs. Let α be the proportion of consequential policy-decisions made by EDDs that is, $\alpha = \left(\frac{A}{A+B}\right)$. Given the finite number of public policy-decisions α must satisfy $0 \leq \alpha \leq 1$. Let β be the proportion of consequential public policy-making decisions made by NEDDs, that is $\beta = \left(\frac{B}{A+B}\right)$ and, once again β must satisfy $0 < \beta > 1$ and, by definition, $1 - \alpha = \beta$.

The incumbent's (whether an EDD or a NEDD) only choice in the model is how to allocate the tax revenue they have given their policy-task to: (a) provide publicly financed goods (pleasing voters) or; (b) appropriate rents for themselves. Thus, the overall government budget constraint, determined by the actions of both EDDs and NEDDs, is:

$$g_{ijt} = \varepsilon_i(\alpha\bar{\tau}y - r_i) + \varepsilon_j(\beta\bar{\tau}y - r_j) \tag{1.02}$$

Where ε_i is the competency of the incumbent EDD, τy_i is the tax revenue controlled by her, and r_i is the rent extraction undertaken by her; ε_j is the competency of the NEDDs, τy_j is the tax revenue controlled by her and, r_j is the rent extraction undertaken by her.

A higher value for ε corresponds to more competent public policy-makers (whether EDDs or NEDDs), as the same resources yield a higher flow of favorable outcomes valued by voters. That is, even though all office holders are rent maximizes in the second period high competency office holders still

[10] This version of the Career concerns model is inspired by person and Tabellini (2001) with permission from MIT University Press.

produce more publicly financed goods. Thus, ε is an intrinsic feature of the incumbent, which is assumed to persist over time so that an incumbent's ability is the same in both time periods. It is assumed that ε is a random variable with uniform distribution:

$$\left[1-\frac{1}{2\chi},1+\frac{1}{2\chi}\right] \tag{1.03}$$

Thus, the expected value of ε is 1 and its density is χ. The range of this distribution is such that, irrespective of the realization of ε and, given, risk-neutral preferences, a non-trivial choice between rents and publicly financed goods is always possible. If an incumbent is removed from office, a new politician is appointed, whose competence is drawn at random from the same distribution.

How the decisions to allocate taxes between the generation of publicly financed goods (signaling competency) and rents is dependent on whether a policy-maker is an EDD or a NEDD. Given that, in the absence of elections, all policy-makers would pursue a rent maximizing strategy, the NEDD, j, who is insulated from the electoral process, derives utility solely from the amount of rents generated over both periods of the game that is:

$$w_j = r_1 + \delta(r_2) \tag{1.04}$$

The EDD's utility function is similar to that of the NEDDs but incorporates the potential trade-off between rent maximizing in the first period and potentially losing the election (due to perceived low competency) and hence forfeiting the benefits of remaining in office in the second period. That is:

$$w_i = r_1 + p_i\delta(R + r_2) \tag{1.05}$$

where p_i is the probability that the incumbent is re-elected, and R is the exogenous ego rents associated with winning re-election. Specifically, the timing of events is as follows: (1) an incumbent politician is in office and chooses rents for the period r_1, without knowing her own competence ε_i; (2) the value of ε_i is realized and publicly financed goods provision g_1 is residually determined so as to satisfy (1.02). Voters observe their own utility but neither ε_i or r_1.; (3) Elections are held. If the incumbent wins, her competency remains ε_i. If she loses, an opponent with a competency drawn at random from the same distribution as the incumbent enters office; (4) period 2 rents, r_2, are set and public goods are residually determined, again so as to satisfy (1.02).

Given this set-up EDD office holders in the second period have no incentive to behave well: they will always appropriate maximum rents, that is $r_j = \bar{r}_j$, implying public spending at $g_2 = \varepsilon_i(\bar{\tau}y - \bar{r})$. Voters are clearly better off with a more competent incumbent (higher ε_i) as this gives them higher second period utility. Consequently voters use elections to reappoint competent politicians and oust incompetent ones, taking into account their observed utility in period 1 (which can be used to calculate both ε_i and r_1) and knowing that the alternative candidate's expected competency is 1, i.e., $E(\varepsilon_i) = 1$.

Equilibrium

The equilibrium outcome depends on: (1) how the probability of re-election conditions the behaviour of incumbent EDDs; and (2) the actions of NEDDs . At the time of the election voters know that the incumbent EDD is maximizing (1.05) and the incumbent NEDD is maximizing (1.04) as well as the distribution of responsibilities between them. Let $\tilde{r}_1$ denotes the solution to the incumbent EDD or NEDD's optimization problem in period 1 (yet to be derived-note that $\tilde{r}_1$ does not depends on ε, since

competence is not yet known). At the time of the election voters know g_1 and $\bar{\tau}$ and can therefore, deduce $\tilde{r}_1$. Hence, by (1.02), voters can, therefore, form an estimate of the incumbent's competence, $\tilde{\varepsilon}_i$.

Beginning with the NEDDs, give their lack of electoral or any other strategic considerations, their optimal strategy, given the budget, τy_j, they control is to set $r_j = \bar{r}_j$ in both time periods $(t=1, t=2)$.

Formally the budget constraint of NEDDs is:

$$g_j = \varepsilon_j(\beta\bar{\tau}y - r_j) \tag{1.06}$$

The competency of NEDDs can be deduced from the residual taxes used to generate publicly financed goods (recall that $\bar{r} < \tau y$). Thus, the expected solution, ε_j, of NEDDs, and hence their contribution to the overall level of rents and publicly financed goods in the first period is:

$$\tilde{\varepsilon}_j = \frac{g_{j1}}{\beta\bar{\tau}y - r_{j1}} \tag{1.07}$$

Given that the competency of the NEDD does not affect her ability to retain policy-making influence- effectively $p_j = 1$- and, therefore, her actions in the first period do not determine her ability to act in the second period. Thus, the NEDD simply maximizes $w = r_{j1}$ subject to her current budget constraint and ignoring what this reveals about her competency or the residual provision of publicly financed goods and services. Thus, her effective budget constraint is simply $\beta\bar{\tau}y$ by choice of r_{j1}. That is the NEDDs constraint is:

$$\beta\bar{\tau}y - r_{j1} \geq 0 \tag{1.08}$$

Differentiating the utility of NEDDs, w_j, subject to (1.06) yields a corner solution (differentiating with respect r_{j1} yields 1). Therefore, NEDDs always pursue a rent-maximizing strategy- only generating the publicly financed goods whose tax cannot be expropriated:

$$\beta\bar{\tau}y - r_{1j} \tag{1.09}$$

That is, in the first period the NEDD maximizes her rent-extraction activities[11]. While NEDDs always pursue a rent-maximizing strategy the residual publicly financed goods, g_{j1}, generated by the tax revenue that cannot be expropriated $(\tau - \bar{\tau})$ reveals the NEDDs competency, (1.07), which allows their specific contribution to overall rents to be calculated with certainty.

It is now possible to deduce, with certainty, the competency of EDDs given (1.09) which reveals the behavior of NEDDs. Formally, the budget constraint faced by the EDD is:

$$g_i = \varepsilon_i(\alpha\bar{\tau}y - r_i) \tag{1.10}$$

Given the voter's re-election rule the EDD is only reappointed if her basic competency is estimated to be greater than or equal to 1. That is:

$$\tilde{p}_i = \begin{cases} 1\_if\ \_\tilde{\varepsilon} \geq E(\varepsilon) = 1 \\ 0\_otherwise \end{cases}$$

[11] The net present value of the rents NEDDs collect over the two period game is $(\beta\bar{\tau}y - r_{1j}) + \delta(\beta\bar{\tau}y - r_{2j})$.

(1.11)

While the EDD and voters do not, initially, know the former's competency, they can use the EDDs actions in the first period to deduce it. Thus, it becomes possible to calculate the EDD's probability for re-election- $\Pr ob[\tilde{p}_i = 1] = \Pr ob[\tilde{\varepsilon}_{i1} = 1]$. Which is simply determined by the level of r_{i1} set by the EDD knowing that the level of g_{i1} is residually determined from the electorally dependent budget constraint $\alpha\tau y$. The estimated competency of the incumbent EDDs, $\tilde{\varepsilon}_{i1}$, can be calculated by:

$$\tilde{\varepsilon}_i = \frac{g_1}{\alpha\tau y - r_{i1}}$$

(1.12)

The interesting thing to note about (1.12) is that, unless there are no NEDDs, that is $\beta^*_{j1} = 0$, the overall level of rents in a polity will be higher, ceteris paribus, as $\beta \to 1$. As will know be shown this is not due to the fact that voters are any less capable of evaluating the competency of the incumbent but simply because a larger percentage of policy-making is not under the control of agents who can be incentivized via elections to refrain from maximal rent-extraction. Thus, the effect of a higher (lower) EDDs/NEDDs ratio is that because voters will only use the EDD's contribution to policy-making to assess her competency pervasive corruption may persists in a polity, due to the activity of NEDDS even if the democratic context works to limit rent-extraction by EDDs.

Combining (1.11) and (1.12), the event $\tilde{\varepsilon}_i \geq 1$ is thus equivalent to:

$$\varepsilon_i \geq \frac{\alpha\bar{\tau}y - \tilde{r}_{i1}}{\alpha\bar{\tau}y - r_{i1}}$$

(1.13)

Consequently, the probability of wining the elections is, as before, the probability that (1.13) is satisfied. It is important to note that $\tilde{r}$ here refers to the rent solution over those substantive policy decisions over which an EDD has discretion and not the rents generated by NEDDs (therefore, unless there are no NEDDs, $\tilde{r}$ is different from its counterpart in the simple model of the previous section). Given the above noted distribution assumptions (1.03) the task discounted probability p_1 can be written as:

$$p_1 = \frac{1}{2} + \chi\left[1 - \frac{\alpha\bar{\tau}y - \tilde{r}_{i1}}{\alpha\bar{\tau}y - r_{i1}}\right]$$

(1.14)

Thus, the incumbent maximizes (1.05) subject to (1.14) by choice of r_1. Note that the resulting first order condition is:

$$1 - \frac{\chi(\alpha\bar{\tau}y - \tilde{r}_{i1})}{(\alpha\bar{\tau}y - r_{i1})^2}\delta(R + \bar{r}) = 0$$

(1.15)

In equilibrium, politicians' choice must be consistent with voters' conjunctures about those choices:

$$r_{i1} = \alpha\bar{\tau}y - \chi\delta(R + \bar{r})$$

(1.16)

Thus, the overall level of rents in a polity is dependent on the policy-making powers of EDDs and NEDDs. Therefore, it is possible to estimate aggregate first period rents (recall the relationship between α and β)[12]:

$$r_{ij1} = (\alpha\bar{\tau}y - \chi\delta(R + \alpha\bar{\tau}y) + (1-\alpha)\bar{\tau}y) \tag{1.17}$$

Differentiating with respect to α yields the comparative effects (testable hypotheses) of altering the EDD/NEDDs ratio on overall rents in the first period. Intuitively as the first order derivative with respect to α has a negative sign, $\partial r_{ij1}/\partial\alpha = (\bar{\tau}y - \chi\delta(\bar{\tau}y) - \bar{\tau}y)$, the amount of rents extracted decreases as α increases. This is because $|\chi\delta(\bar{\tau}y)|$ increases as $\alpha \to 1$ so that the gap between $|\bar{\tau}y - \chi\delta(\bar{\tau}y)|$ and $|\bar{\tau}y|$ increases. Intuitively as $\alpha \to 1$ then a greater percentage of first period rents will be derived by the utility considerations of EDDs who have an incentive to take into account the possibility of retaining office $(\bar{\tau}y - \chi\delta(\bar{\tau}y))$. Conversely as $\alpha \to 0$ then a greater percentage of first period rents will be derived by the utility considerations of NEDDs who have no incentive to pursue anything other then a rent-maximizing strategy $(\bar{\tau}y)$. Thus, on the margin, as $\bar{\tau}y - \chi\delta(\bar{\tau}y) < \bar{\tau}y$ it follows that a higher EDD/NEDDs ratio will reduce the average incidence of rents over the two periods as, in the first period, the discretionary policy-maker has marginally more incentives to limit her rent-extracting activities in order to secure her tenure in office.

Given that most incumbents, at least in high-income democracies, seek re-election (are career concerned) the major testable implication of the model, (**Hypothesis 1**), is that **a higher EDD/NEDD ratio should be associated with less rent-extraction**. Furthermore, an ancillary hypothesis (**Hypothesis 2**) can also be deduced. Namely: that, as that the distinction between EDDs and NEDDs is conditional on the level of institutionalized democracy; the EDD/NEDD ratio will have diminishing explanatory power in contexts in which elections are, on the margin, less important. **That is, the effect of the EDD/NEDD ratio on the level of rent-extraction is conditional on the existence of a democratic context.**

Empirical Hypothesis Testing

Methodology

Testing the implications of the model has two main components. Firstly, at the macro-level, the public policy outcomes (level of rent-extraction) generated by policy-makers should be conditional on the nature of public policy-making (EDD/NEDD ratio) and the existence of a functional democratic context. At the micro-level the magnitude of retrospective voter evaluation should also be conditional on these two contextual factors. The focus of this article is on evaluating the robustness of the macro-level prediction (level of equilibrium rents). This focus is due to the fact that the: (1) macro-level implications have only been derived by the game-theoretic extension of the DSM above and have not, therefore, been tested before; (2) the micro-level implications of the model, at least with respect to economic policy, have already been found to be robust (Duch and Stevenson, 2008 pp.178-206)- that is voter evaluation is stronger in a high EDD/NEDD ratio context; (3) unlike economic variables there are significant problems with using data on corruption perceptions for temporal analysis necessary to test the micro-level implications of the model (Treisman, 2007; World Bank 2011). It is envisaged that the micro-level elements of the model will also be tested in future work but the focus here is on establishing a robust association between the model and policy outcomes.

[12] Rents can only be expropriated from the policy tasks from which an actor has discretion. Therefore, $\chi\delta(r_i) = \chi\delta(\alpha\bar{\tau}y)$, that is, the amount of rents an EDD can export is a positive monotonic function of the policy-making discretion her office accords her. Also by definition, $\beta = 1 - \alpha$.

With respect to operationalizing and testing the large literature on measuring rent-extraction and economic voting provide clear guidance regarding which variables need to be utilized for this exercise to be valid. Specifically, most of the variables of interest are available from Persson and Tabellini's (2003) canonical dataset, which includes a dummy variable for high-income democracies[13]. In order to construct the EDD/NEDD ratio the World Bank's (2011) measure of regulatory quality (regulatory density[14]) is added to the dataset (1998-2000).

The Sample

The data used to test the model is the same dataset used by Persson and Tabellini (2003) in their seminal analysis of the economic effects of constitutions. The dataset has been augmented to include a measure of regulatory quality (one of the independent variables of interest) as well as additional control variables identified in the literature as being potentially critical determinants of rent extraction. Furthermore, two separate analyses of the dataset are undertaken. One utilizes only high-income democracies (n=19-21)[15], with the aim of establishing whether the theoretically anticipated relationship between the EDD/NEDD ratio holds, given a relatively homogenous set of countries. The other utilizes all countries available (n=52-58)[16], which introduces heterogeneity in the sample (hence a need to control for more variables), but also enables more tests of the robustness of the initial results. In both cases, the substantive results should be the same. Specifically, it should be observed that an increase in the EDD/NEDD ratio is associated with a reduced level of rent extraction.

The Dependent Variable

There is a lively debate regarding how to measure corruption and rent extraction (see for example Tresiman, 2007, Olken 2009, and Kauffman et al 2007). However, despite continued controversies over (1) the validity of subjective measures of rent extraction (such as Transparency International's (2011) Corruption Perceptions Index or the World Bank's (2011) Good Governance Indicators) and (2) the external validity of more narrow objective measures of rent extraction (such as the UN's (2011) data on bribery) there is now a growing consensus that, as long as standard errors are taken into account most of these major measures of rent extraction are valid and reliable and measuring the same underling variable (Kauffman et al 2007). Given that Transparency International's Corruption Perception Index (CPI) is most substantively focused on politically sensitive corruption vis-à-vis other indicators (Hamilton, 2012; Persson and Tabellini, 2003) this measure of rent extraction (see Appendix A for details) is used as the dependent variable of interest (it is in fact inverted so that lower scores denote less corruption). However, substituting this depended variable for other measures of rent extraction (see next Section and Hamilton 2012) does not alter the robustness of the findings.

Because the CPI scores is constrained (cannot exceed or be less than a given value; 0-10) the CPI is not, strictly speaking, drawn from normal distributions (which must, by definition, vary from negative to positive infinity). While many researchers simply use OLS to run regressions on such variables, this is potentially problematic because the nature of these variables means that the residuals of such models may only approximate that of a normal distribution. If the residuals are not normally distributed, then the results of such analyses will be biased either over- or under-estimating the influence of the independent variable of interest on the dependent variable.

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[13] Australia, Austria, Belgium, Canada, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Japan, Luxembourg, the Netherlands, New Zealand, Norway, Portugal, Spain, Sweden, Switzerland, USA and the UK.

[14] It is important to note that the measure of regulatory quality measures regulatory density rather than corruption/rent-extraction, which is captured by one of the other good governance variables (Control of Corruption).

[15] See Footnote 13.

[16] This includes a variety of new democracies and non-democracies. See Persson and Tabelinni (2003) for details.

Empirical tests of the baseline model below confirm the importance of this issue. Specifically, the results of the Komonov-Smirnov test (not shown), used to evaluate whether the residuals of an OLS analysis approximate a normal distribution fails to confirm that, when using these the CPI as a dependent variable, the residuals approximate a normal distribution. Given the fact the CPI can be converted into fractional scores (they can be represented as a fraction from 0-1), it comes from a binomial distribution, and following the advice of Papke and Woolridge (2006), a maximum-likelihood fractional logit specification is the most appropriate to use in such cases (hereafter referred to as GLM). However, because OLS results are still widely used, they are often reported (at least for the main results) in order to establish whether the outcomes are sensitive to modeling assumptions.

The Independent Variable

In order to test the robustness of the theoretical model, especially against rival explanations, it is essential to develop a measure of the EDD/NEDD ratio. Fortunately, a blueprint for devising such a measure has already been developed by Duch and Stevenson (2008), albeit a blueprint designed to measure how changes in the EDD/NEDD ratio affect the economic vote, rather than the incentives office-holders have in order to engage in rent extraction. However, adapting this measure for the present purpose of explaining the ratio's effect on the marginal propensity of public policy-makers to engage in rent extraction is relatively straightforward. Similar measures of the size of the public sector, regulatory density, and statist public policy-coordination (policy coordination by public policy-makers in the absence/controlling for the existence of alternative means of oversight by peak interest groups or alternative oversight mechanisms[17]) are utilized to measure the ratio. As Duch and Stevenson's (2008) blueprint shows, these measures capture the extent to which public policy-making is extensive and dominated by NEDD (large public sector, high regulatory density and public policy coordination), or limited and dominated by EDD (small public sector, low regulatory density and a lack of labor/policy-coordination).

Thus, a more extensive public sector is associated with a lower EDD/NEDD ratio and, if the model is correct, a greater proportion of policy-makers who, unconcerned about re-election incentives, follow a rent-maximizing strategy at all times. Of course, if the model is incorrect and other sanctioning mechanisms (detection) and incentives (long-term growth concerns; peer reviewed career trajectories) incentivize NEDDs to be as effective or more effective in the delivery of publicly-financed goods and services, then an increase in the EDD/NEDD ratio will either be an insignificant or a negative predictor of the level of rent extraction. Having established the logic of the link between the EDD/NEDD ratio and the existence of an extensive or limited government, it is now possible to examine the different components of public policy-making, (which are the size of the public sector, the regulatory density, and policy-coordination) to specifically explain how these affect the EDD/NEDD ratio.

The Size of the Public Sector

Broadly, public sector outputs entail two distinct activities: the redistribution of monetary resources (transfers) and the provision of publicly-financed goods and services. The size of the public sector is usually measured by either the amount of revenue raised or the value of expenditure undertaken by the state as a percentage of GDP. Therefore, expenditure as a percentage of GDP is a cardinal measure[18] that can be represented as a relative proportion of a sum (or a percentage) and is usually greater than 0 and less than 100 (at least in high-income democracies.). This measure has long been one of the factors identified as potentially explaining the incidence of rent extraction (Tanzi, 1998). As Duch and Stevenson (2008) have shown, a more extensive public sector results in both more EDDs and NEDDs but, critically, the proportion of EDDs/NEDDs decreases as the

[17] The existence of stakeholder oversight of public policy coordination can reduce, although not eliminate, the magnitude of rent extraction. This point is made by Olson (1981) and illustrated, with respect to the efficient use of taxation, by Beramendi and Rueda (2007). Once such oversight mechanisms are controlled for, increased coordination of public policy-making is associated with increased rent extraction.

[18] As it can, in theory, range from positive to negative infinity.

complexity, and hence specialist knowledge, associated with an ever-increasing scope of publicly-financed decision-making, has the effect of increasing the prominence of NEDDs relative to EDDs. Formally, as the size of the public sector increases:

$$\alpha_l > \alpha_s \text{and } \beta_l > \beta_s \tag{1.18}$$

where l denotes a large public sector and s denotes a small public sector. Given that increments in government size are associated with increased complexity, and hence relatively more policy-making power for NEDDs, it follows that:

$$\frac{\alpha_l}{\beta_l} < \frac{\alpha_s}{\beta_s} \tag{1.19}$$

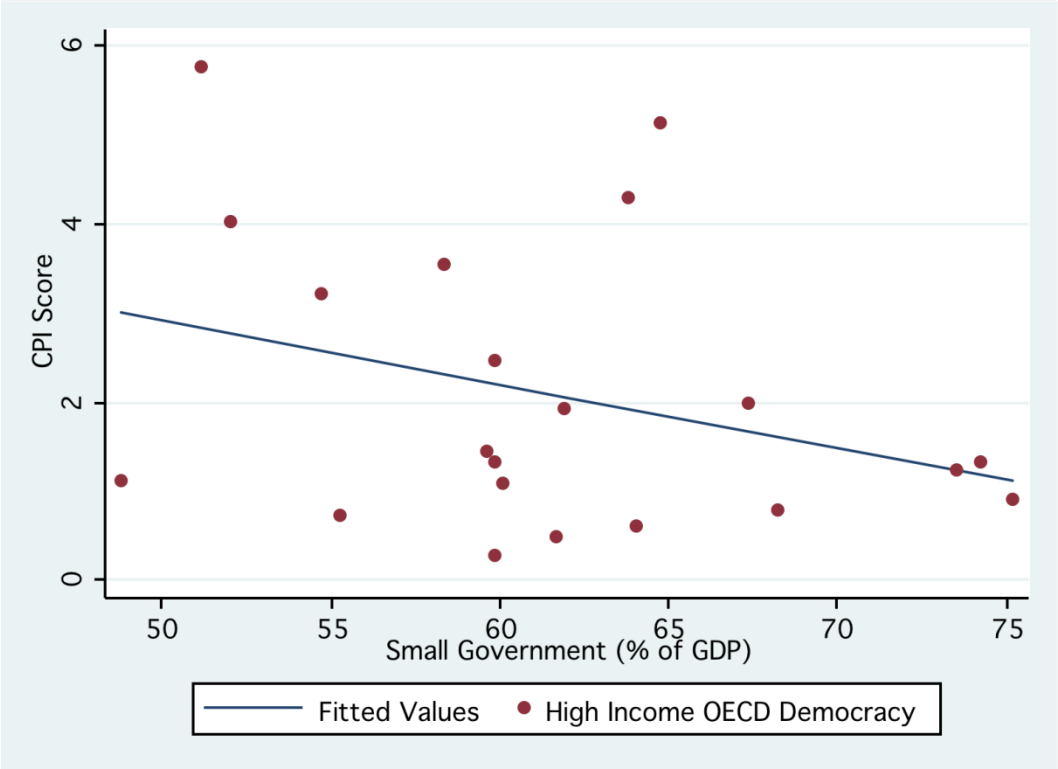
That is, the EDD/NEDD ratio in large states is less than the EDD/NEDD ratio in small states. If the model is correct, it follows that countries with smaller public sectors and hence a higher EDD/NEDD ratio will experience rent extraction. As Figure 1.01 below shows, high-income democracies with relatively small public sectors appear to experience less rent extraction[19] vis-à-vis high-income democracies with larger public sectors. For ease of interpretation, the x-axis measures the value of the private sector, i.e. the relative size of the private sector vis-à-vis the size of the public sector (as a percentage of GDP). Essentially, this relative measure of the size of government is calculated by subtracting 100 from the size of public sector expenditure (measured by the size of public expenditures as a percentage of GDP). A country's relative size of the 'private sector' will obviously be smaller as the size of the public sector is larger, as 100 minus an ever-larger number yields an ever-smaller outcome[20]. Therefore the measure generates a simple cardinal measure of public sector size that is easy to interpret and easy to convert into a fraction (simply dividing the final score by 100 – critical when combining the different measures of limited government into an index; see below)[21].

[19] Measured by the standard error weighted averaged Corruption Perceptions Index (CPI) score of countries between 1995-2000 (higher scores denote less rent extraction).

[20] Obviously, as this measure is an inversion of public sector size it is perfectly and negatively correlated (-1.00) with the size of the public sector as a percentage of GDP.

[21] As in all the countries in the sample, the level of government expenditure is not equal to zero (or less) and is not greater than 100. The level of government expenditure is the inverse of the size of government as a percentage of GDP.

Figure 1.01: The Inverse of the Size of Government and Rent Extraction[22] (High-Income OECD)



Source: Persson and Tabellini, (2003)

Therefore, at least when utilizing a simple bivariate analysis, it appears to be the case that there is tentative empirical support for the proposition of the model regarding the size of government and rents in high-income democracies. Specifically, a higher EDD/NEDD ratio will reduce the level of rent extraction, because a smaller state is associated with proportionally more decision-making being made by EDDs rather than NEDDs, because the size of the state is positively associated with policy-making complexity that favors NEDD decision-makers.

Regulatory Density

A second critical dimension of the extensiveness of the state is regulatory density. This dimension of statism has already been linked to increased complexity and subsequently exacerbated oversight problems for elected office-holders (Spiller, 1990). Regulatory density has also been linked to increased rent extraction both theoretically (Tullock, 1967; Posner, 1971) and empirically (Djankov et al 2002). Furthermore, it is not difficult to argue that, as regulatory density increases, the proportion of NEDDs (e.g. regulatory experts, lobbyists of specialist industries, etc.) versus EDDs will favor the former (Duch and Stevenson 2008). Thus, the proliferation of increasingly specialist policy-making by independent experts, lobbyists, and other stakeholders in an increasingly dense regulatory environment, has the effect of reducing the EDD/NEDD ratio.

As before, this reasoning can be summarized formally: as regulatory density increases, more public policy decision-making is made (both EDDs and NEDDs increase). However, regulatory complexity ensures that while the volume of both EDDs and NEDDs has increased, proportionally more decision-making is made via NEDDs than EDDs (Duch and Stevenson, 2008). That is:

$$\alpha_{dr} > \alpha_{lr} \text{ and } \beta_{dr} > \beta_{lr} \tag{1.20}$$

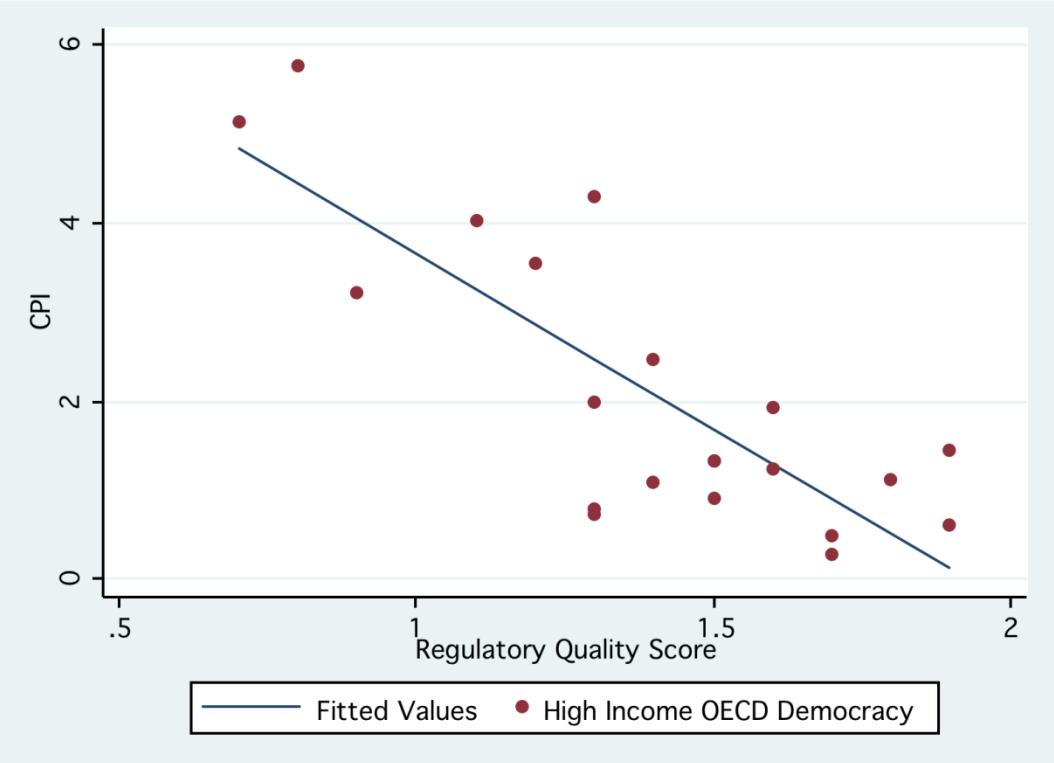
[22] The data for each country is the average between the years 1995-2000 (Persson and Tabellini, 2003).

where dr denotes a dense regulatory environment and lr denotes a limited regulatory environment. Given that increments in regulatory density are associated with increased complexity and hence relatively more policy-making power for NEDDs, it follows that:

$$\frac{\alpha_{dr}}{\beta_{dr}} < \frac{\alpha_{lr}}{\beta_{lr}} \tag{1.21}$$

Figure 1.02 shows the bivariate relationship between effective regulatory density and rent extraction. Regulatory density is measured using the World Bank's good governance indicator of regulatory quality (for 1999). Each country receives a score ranging from -2.5 (very poor regulatory quality/unnecessarily extensive regulation) to 2.5 (very high regulatory quality/low relative regulatory burden). Specifically, a country's score combines a host of indicators of regulatory density (volume and costs of regulations) and is designed to capture the extent to which government implements 'sound policies and regulations that permit and promote private sector development. (World Bank 2011)' Representative measures[23] used to construct the measure include: (1) the density of import and export regulations; (2) the level of business regulations; (3) the magnitude of tariffs, price controls and non-tariff barriers; (4) the total burden of administrative regulations; and (5) the ease of starting as well as closing a business – all variables that are traditionally associated with capturing the density of regulations (ibid). As Appendix A notes this indicator is very similar to the original one used by Duch and Stevenson (2008) to measure regulatory density)[24]. Consistent with the expectations of the model, higher regulatory density scores are associated with more rent extraction.

Figure 1.02: Regulatory Density and Rent Extraction (High-Income OECD)



Source: The World Bank, 2012. Data from 1999.

[23] See Appendix B for details.

[24] For example, the regulatory costs associated with starting a business are now a standard way of measuring a snapshot of regulatory density (World Bank, 2012b).

Public Policy Coordination

A final critical dimension of the expansiveness of the state is the extent to which public policy-making allows for the formal and informal participation of key 'stakeholder groups'. A corporatist or coordinated *modus operandi* in which large labor unions and business associations coordinate to make policy-decisions (especially on wages), developed in many European countries following World War II (Hall and Soskice, 2001). As Hal and Jones (1999) explain, such a policy-making *modus operandi* results in a significant role for organized interest groups. More generally, 'policy-coordination' can be described as a *modus operandi* in which elected policy-makers may play a critical role (agenda setting or mediating), but in which key stakeholder positions in decision-making are at least shared by unelected officials.

As Alesina and Perotti (2004), among others, have noted, one institution that encourages more coordinated policy-making, among at least some OECD countries, is the European Union (EU). While the specific extent to which EU law requires coordination differs (in regulations and directives; see Muller, 2003), EU membership requires EU member states to make many laws that are: (1) initiated by the EU Commission (unelected executive arm of the EU); (2) agreed upon by at least some other member states (unelected officials from the perspective of domestic constituents) and; 3) in a more limited number of cases, influenced by the opinions of the Committee of Regions, and the Social and Economic Committee. From this it follows that if EU membership, by fostering public policy-coordination in a wide range of fields, increases the role of NEDDs in policy-making, then the level of (politically sensitive) rent extraction should be higher in EU states relative to other high-income OECD countries. However, as will be argued below, not all types of policy-coordination might result in increased rent extraction.

Of course, given that the original powers of the EU emanate from (and can be revoked by, albeit with extreme difficulty) the decisions of nationally elected EDDs, it is possible to argue that the logic of electoral accountability should extend to the EU itself (see Moravcsik, 2004, for a strong argument in favour of the EU as an inter-governmentally controlled entity). In fact, there is theoretical and empirical evidence to suggest that the nature of EU policy can be explained by pre-existing national preferences. Thus, Beramendi (2007) argues that pre-existing economic disparities between EU member states can explain why EU competences extend to the common market and, in the case of euro-members, monetary, but not fiscal, policy (lack of national level consensus).

While it is the case that national level decisions made by EDDs are critical in authorizing the growth of EU powers, it does not follow that the governance consequences of EU membership do not insulate public policy-makers from future electoral scrutiny. As Besley and Coate (2000) have formally demonstrated, it is possible that voters may be willing to accept sub-optimal outcomes on some dimensions if elected policy-makers can present them with 'take-it-or-leave-it' bundles of policy positions. As the EU may confer other benefits (the common market, geopolitical stability, etc.), new EU member state electorates face a 'take-it-or-leave-it' decision on whether to join the EU. Thus, it is entirely possible that the EU results in a deterioration of electoral accountability due to public policy-coordination, even if it was originally designed to address the substantive concerns of national level EDDs.

As before (Duch and Stevenson, 2008), it is possible to formalize this argument that increased policy-coordination results in a lower EDD/NEDD ratio, namely:

$$\alpha_{cw} > \alpha_m \text{ and } \beta_{cw} > \beta_m \tag{1.22}$$

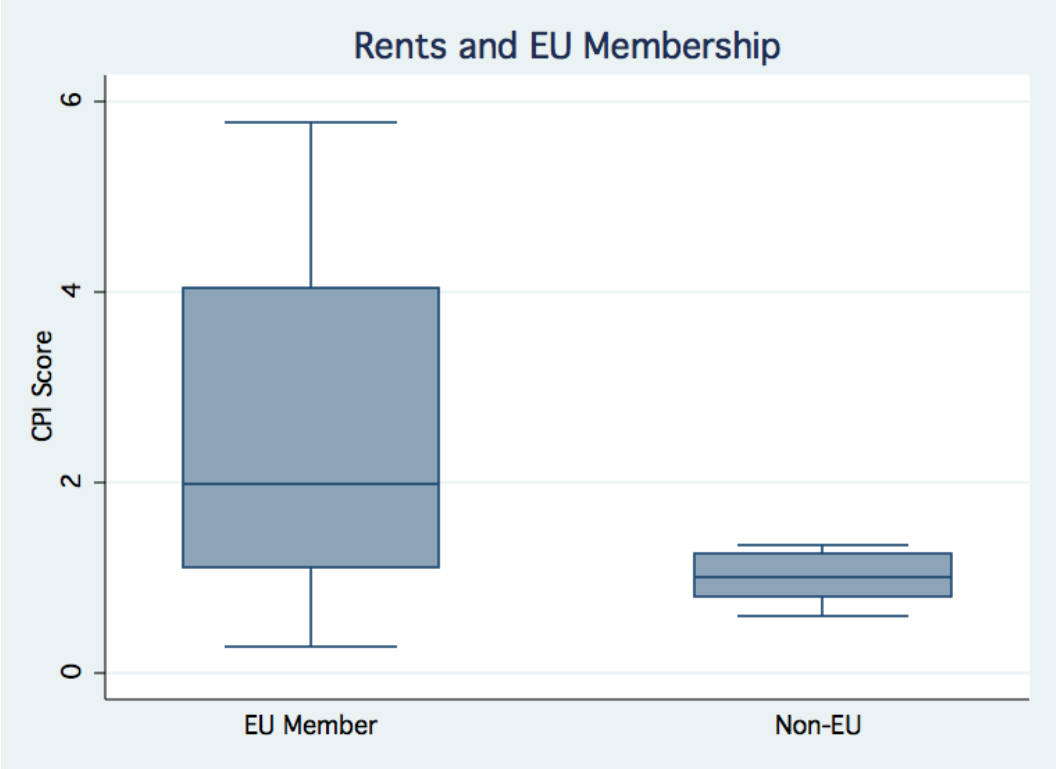
where cw denotes a coordinated policy environment and m denotes a limited or market oriented policy-making environment[25]. Given that increments in coordination density are associated with increased participation of NEDDs in policy-making, it follows that:

[25] As Duch and Stevenson (2008, pp.192) argue, with respect to economic corporatism, an absence of corporatism or general public policy coordination – more decision-making in a market context – increasing the proportion of EDD decision-making is not odd if there is 'a careful distinction between governmental and electoral accountability. In a free market for labour, the government makes some decisions and is electorally accountable for them (say, investment in education). But in a corporatist

$$\frac{\alpha_{cw}}{\beta_{cw}} < \frac{\alpha_m}{\beta_m} \tag{1.23}$$

As Figure 1.03 shows, as a box-plot of the level of rents by high-income democracies that are/are not EU member states, EU membership among these countries (captured by a dummy variable that takes the value of 1 if an OECD state is an EU member) is associated with more rent extraction. Of course, because self-selection into the EU is restricted by geography and a host of other factors[26], these bivariate results have to be treated with caution. Still, the fact that the median non-EU state had a lower (inverted) CPI score than even the best performing EU state, suggests that a robust association, as anticipated by the model, is consistent with the empirical evidence.

Figure 1.03: Policy-Coordination and Rent Extraction



EU Members: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Ireland, Italy, Luxembourg, the Netherlands, Portugal, Spain, Sweden, and the UK. Non-EU: Australia, Canada, Iceland, New Zealand, Norway, and Switzerland. The outlier case of Japan is omitted.
Source: The Author

However, it is important to note that policy coordination, while reducing the efficacy of elections, may generate countervailing effects that limit the incentives for rent extraction. This is because successful policy-coordination among encompassing or 'peak organizations' may limit the incentives for rent seeking (Olson, 1981). Narrow rent-seeking interest groups may have an incentive to organize in order to lobby for the public financing of private goods (narrow benefits diffuse costs) at the expense of latent groups. Unlike these, however, peak organizations may have an incentive to take into account the societal consequences of their actions, because they represent the interests of large latent groups. Given the potentially ambiguous effect of policy-coordination on incentives for rent seeking – due to its effect on the efficacy of elections and the

system, these decisions, and many others, become party to the overall societal bargain that is as much the responsibility of labour unions and business as it is of the politicians.'

[26] For example, Greece's entry in 1981 occurred despite the recommendations of the Commission as the Council (EU member states) considered the geopolitical factors as well as the consolidation of democracy as reasons to override concerns regarding socio-economic governance.

possibility of allowing peak organizations to make policy – it is necessary to control for the possible positive effects of such a *modus operandi*. Thus, in the multivariate analysis that follows, a dichotomous control will be introduced to take into account those countries identified as having successfully developed a coordinated policy-making context[27], in which the peak (economic) organizations make policy alongside elected officials (coordinated capitalist economies, or CMEs; see Hall and Soskice, 2001[28]). Introducing the control for CMEs alongside the dummy variable for EU membership (next section) therefore allows the effect of different types of policy-coordination to be identified. Membership of the supra-nationally bureaucratic nature of policy-coordination within the EU can be contrasted with the effect of national level peak group policy-making among coordinated capitalist economies.

A Combined Index of the Extensiveness of Government

The logic behind the selection of the three above-noted variables (government size, regulatory density, and public policy-coordination) is that they are measuring the extensiveness of government, which in turn determines the EDD/NEDD ratio. From this it follows that combining these measures should provide an index of the overall level of government extensiveness and hence the EDD/NEDD ratio (α/β). This is important because any individual measure of government extensiveness may be unrepresentative of the scores on other dimensions of extensiveness[29]. A country may have a very low tax burden – suggesting a high EDD/NEDD ratio – but a very dense regulatory environment may counter this effect. One simple way to produce such a 'multi-dimensional' measure of the EDD/NEDD ratio is to combine the indicators into an additive scale. In order to do this, it is essential to first rescale the two interval indicators – the inverse of government expenditure and regulatory quality – into fractional data, ranging from 0-1, so they are on the same scale as the dichotomous EU dummy variable[30] (additive approach). That is:

$$\frac{\alpha}{\beta}(extensivness) = \sum(fiscal + regulatory + coordination) \tag{1.23}$$

where fiscal is the inverse of government expenditure (the size of the private sector) as a proportion, ranging from 0-1, regulatory is the nature of regulatory density ranging from 0-1, and coordination is a dummy variable which takes the value of 1 if a country is an EU member state. In short, the three indicators now have the same weighting, as they can, theoretically, only range from 0-1.

However, while the results for the additive index are robust and consistent with the theoretical arguments (as it is simply the addition of the effect of the three independent variables; see (1.20) – (1.22)), it is important to treat them with caution. This is because while the theory suggests that the three variables used to generate the additive index should be measuring the same underlying latent variable of government extensiveness, the theory does not suggest that the three variables have equal effect on this underlying measure. In reality, it may be the case that an increment in, for example, regulatory density reduces the EDD/NEDD ratio

[27] Austria, Belgium, Denmark, Finland, Iceland, Germany, Japan, the Netherlands, Norway, Sweden and Switzerland (Hall and Soskice, 2001).

[28] It is important to note that the typology of coordinated capitalist economies was developed to explain the organization of production, by firms, in the economy. However, the notion of successful coordination is essentially complementary to Olson's notion of peak organizations and, unsurprisingly, Switzerland, which is noted by Olson as being the paragon of a country that has successfully developed a peak organization based policy-making process, and is also considered a coordinated capitalist economy.

[29] For example, while the Scandinavian countries tend to have a larger formal tax burden vis-à-vis other countries (Diagram 1.01), they also tend to have some of the lowest regulatory burdens vis-à-vis other high-income democracies (Diagram 1.02).

[30] This is simply achieved by dividing the inverse of government expenditure by 100 as it is already in percentage format (no country has negative expenditure so this is unproblematic). In the case of the regulatory quality indicator, which ranges from -2.5-+2.5, 5 is added to every country score (eliminating negatives but not changing the rank ordering) and then the results are divided by 10.

at a faster rate than an increment in fiscal expenditure. Given that the theory provides no basis for deducing what analytical weights may be the most valid, it may thus be the case that the additive index suffers from non-random measurement error.

While the nature of the bias in the additive index may be impossible to estimate, it is possible to use confirmatory factor analysis as a robustness check, both for the underling theory and the additive index. This is because by utilizing the correlation matrix between the three independent measures of government extensiveness, in order to determine 'factor loadings' of any potential underlying latent variables, it becomes possible to test empirically whether, as the model would suggest, these three variables do in fact positively load on a potential latent measure of government extensiveness. This is because confirmatory factor analysis uses the actual data (correlation matrix) rather than arbitrary weights to construct an index/measure of the underling latent variable. Of course, given its confirmatory nature, it is not necessarily the case that any underlying latent variable is in fact a measure of government extensiveness. However, the logic of the proposed model would suggest that such a variable should exist, and therefore if the results are consistent with the theory, this would constitute a significant robustness check of its predictions.

Consistent with the theoretical expectations, the confirmatory factor analysis does indicate that the three variables of government extensiveness have factor loadings of the same sign, and the latent variable's Eigen value is greater than one (Eigen value=1.31). In short, the factor analysis provides an alternative, cardinal indicator – in this case ranging from -1.07-+2.02 – with which to check the initial additive results (see Appendix B for more details). Furthermore, the spearman rank correlation between the additive index and the confirmatory factor analysis scores is 0.85, and the null-hypothesis that the two scores are independent of each other cannot be rejected even at the 1% confidence interval. Thus, while it is not possible to know, with certainty, whether the additive index or the confirmatory factor analysis are capturing a multi-dimensional measure of government extensiveness, the results are robust, indistinguishable from each other, and entirely consistent with prior theoretical expectations. This suggests that while measurement error may be present, it is not driving the results, as the use of different weights (equal weights in the case of the additive index; empirically-derived for the confirmatory factor analysis) yields statistically similar outcomes.

Controlling for Alternative Oversight Mechanisms

In contrast to the argument advanced so far it is possible to claim that alternative mechanisms to elections might be more effective in limiting rent extraction (see discussion in previous section and Appendix B). As Olson (1981) argued the role of 'encompassing' (peak organizations) in public policy-making may limit the incentives for rent extraction even as it increases the role of NEDDs. This is because such 'peak organizations' may represent the broad interests of voters even though they limit the efficacy of elections (lower EDD/NEDD ratio). While it is beyond the scope of this paper to examine whether this contested argument regarding the effect of peak organizations is valid it is useful to examine the robustness of the EDD/NEDD ratio when controlling for this potential rival theoretical argument. Thus, in order to control for the successful integration of peak organization in a more NEDD dominated policy-making, this paper uses a dummy variable to identify successful 'coordinated capitalist economics' (CCE's)[31] as identified by Hall and Soskice (2001) as a control variable.

Vector of Control Variables

As noted in the introduction there now a large number of variables associated with changes in rent extraction. In order to limit the incidence of omitted variable bias most of these variables, as identified in the literature (Hamilton, 2012; Persson and Tabellini, 2003) are included in the regression analyses. Broadly, two categories of control variables have been identified- (1) 'Basic Controls'- those variables robustly associated with variation in rent extraction (namely the age of democracy, log of per capita income, long-term economic openness, geographical location, and primary and secondary school

[31] CCEs are Austria, Denmark, Finland, Germany, Japan, the Netherlands, Norway, Sweden, and Switzerland.

enrolment) and (2) 'Additional Controls'- those variables that have sometimes been found to affect the level of rent extraction (namely ethnolinguistic fragmentation, income inequality, log of the population, the size of extractive industries (as a % of GDP), the current level of democratization, demographic characteristics of the population (age structure), whether a state has a federal structure, current levels of economic openness, the region of the world a country is located in, and years since independence) (for details see Appendix A and Hamilton 2012). Depending on the sample size (high income only or all countries available) either the Basic Controls or the Basic Controls and the Additional Controls are utilized.

Identification Strategy

In order to establish whether a robust negative association between the EDD/NEDDs ratio and the level of rent extraction exists, **Hypothesis 1,** it is essential to utilize a multivariate specification that can control for the determinants of rent extraction that might also be associated with the EDD/NEDDs ratio. The baseline identification strategy is:

$$RENT_i = \beta_{1i} EDDs_i + Z_i + u_i \tag{1.24}$$

where $RENT_i$ is a measure of rents in country *i*, $EDDs_i$ is country *i*'s score on either (1) an individual measure of the EDD/NEDDs ratio; or (2) the EDDs/NEDDs index (combined score on all three dimensions using factor analysis-see next see below), and Z_i is a vector of control variables.

In order to test the ancillary hypotheses, **Hypothesis 2**, that the efficacy of the EDD/NEDD ratio is conditional on the existence of a well-established democratic context it is essential to modify (1.31) to take into account the interaction effect of the EDD/NEDD ratio and this context:

$$RENT_i = \beta_{1i}(EDDs_i * DEM_i) + \beta_{2i} EDDs_i + \beta_{3i} DEM_i + Z_i + u_i \tag{1.25}$$

where $EDDs_i * DEM_i$ is the interaction term between the EDD/NEDD ratio of country *i,* and a dummy variable, DEM_i, which takes the value of one if country *i* is classified as a 'high-income democracy' country (see above the section on the sample above for a definition).

There is a trade-off between using (1.24) vs. (1.25) as an identification strategy. (1.24) restricts the analysis to the sub-set of countries that are high-income democracies thus, potentially controlling for a large number of omitted variables. However, the relatively, small sample size restricts the inclusion of a large number of ancillary control variables. (1.25) allows for a larger dataset to be utilized but introduces the risk that some unobserved omitted variables might bias the results. In particular, in a large dataset, which includes fragile states, measures of the EDD/NEDD ratio might be correlated with a lack of state capacity that is only partly controlled for by other socio-economic controls. Thus, interpretations of the EDD/NEDD ratio in the pooled dataset/restricted to the non-high income democracies need to be treated with caution. Generally it is anticipated that the EDD/NEDD ratio will be most robust when restricted to the high-income sub-sample.

Results

Basic Multivariate Model

Before examining the robustness of the ability of the different measures of the EDD/NEDD ratio to predict variation in rent extraction (using both the high-income and the pooled datasets), it is important to first establish whether the most basic theoretical assumptions of the model hold. Specifically, if the model is correct, at a minimum, it should be the case that each component variable of the measure of government extensiveness should significantly predict variation in rent extraction among high-income democracies, as anticipated by the

model (higher scores on all these variables should, individually, be associated with lower levels of rent extraction).

Table 1.01 shows that, using the raw scores of each individual indicator of limited government (higher EDD/NEDD ratio), each indicator is a robust predictor of the level of rent extraction within a high-income democracy context. This is independent of (1) the use of the two different datasets and their associated vector of controls variables[32]; and (2) the distributional assumptions made, regarding the dependent variable of interest (interval regression, OLS, and ordered probit all yield the same qualitative results; see note underneath the table).

Specifically, Regression Models 1, 2, and 3 all show that when utilizing the homogenous sub-sample of countries that are considered high-income democracies, each one of the independent variables of interest, has the expected predicted effect on the level of perceived rent extraction. Namely, each of these measures of a higher EDD/NEDD ratio (low regulatory density, the inverse of the size of government, and non-membership of the EU), is significantly (at the 1% level respectively) associated with less perceived rent extraction. Utilizing the larger sample, which allows for the inclusion of all the additional control variables identified above- (Ethno-linguistic fragmentation, income inequality, (log) population, size of extractive industries, democratization (current), demographic dummy variables, economic openness (current), religious make-up variables, regional dummies) also yields the anticipated results. Specifically, the interactions effect of each of the independent variables of interest (low regulatory density and the inverse of government size[33]) and whether a country is a high-income democracy, is significantly (at the 10% and 5% level) associated with less perceived rent extraction. Interestingly, once this interaction effect is controlled for, the independent effect of each independent variable becomes erratic. Thus, while the measure of regulatory density continues to exert an independent effect on rent extraction (negative and significant at the 1% level: Regression Model 4), the independent effect of the inverse of the size of government is statistically insignificant (Regression Model 5). These results are thus entirely consistent with the predictions of the model; specifically, that all measures of the EDD/NEDD ratio should have a consistent effect on incentives for rent extraction within a high-income democracy context.

[32] The basic control variables consist of the most robust determinates of rent extraction (see Treisman 2007) while the additional control variables consist of all the determinants of rent extraction utilized by Persson and Tabellini (2003).

[33] Due to the partial colliniarity of the interaction term between the non-EU and EU OECD interaction term, the appropriate model could not be estimated. However, following standard practice combining the variables into additive and latent variable indices, allows for the inclusion of this theoretically important variable in subsequent regression models below.

Table 1.01 The Individual Measures of Limited Government (EDD/NEDD Ratio) and Rent Extraction

	Corruption Perceptions Index (CPI)				
	(1) (GLM)	(2) (GLM)	(3) (GLM)	(4) (GLM)	(5) (GLM)
	Raw Score	Raw Score	Raw Score	Raw Score	Raw Score
Regulatory Density*High-Income Dem				-3.80* (2.16)	
Small Govt* High-Income Dem					-4.49** (2.22)
Regulatory Density	-19.37*** (4.00)			-1.00*** (0.12)	
Non-EU		-1.01*** (0.36)			
Small Govt			-7.00*** (2.00)		1.31 (1.33)
High-Income Democracy				-0.057 (0.35)	1.92 (1.40)
Coordinated Capitalist Economies	-0.43 (0.32)	-0.61* (0.34)	-0.52 (0.38)	-0.27* (0.16)	-0.096 (0.32)
Economic Openness (Long-Term)	-0.43 (0.84)	2.01*** (0.59)	2.83*** (0.70)	0.0094 (0.0036)	-.095 (0.30)
Latitude	-1.73 (1.53)	-3.39** (1.54)	-4.75** (1.91)	-0.44 (0.57)	-1.50 (1.19)
(log) Per capita income	-0.42 (0.41)	-0.73 (0.48)	-0.93** (0.45)	-0.37** (0.11)	-0.47** (0.20)
School Enrolment	0.014 (0.12)	-0.014 (0.020)	-0.02 (0.01)	-0.0038 (0.0038)	-0.020** (0.0089)
Additional Controls				√	√
Sample	High-Income Dem	High-Income Dem	High-Income Dem	All	All
Number of Observations	21	21	21	54	52
Log-Likelihood	-6.69	-6.42	-6.97	-20.41	-19.90

Note: robust standard errors in parentheses. * Denotes significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level. CPI score divided by 10 to aid interpretation. OLS results are -0.36** (0.08); 0.14* (0.07); 0.01*** (0.005); -0.0031 (0.067),-0.013* (0.0068); for models (1), (2), (3), (4) and (5) respectively. Additional controls: Ethno-linguistic fragmentation, income inequality, (log) population, size of extractive industries, democratization (current), demographic dummy variables, economic openness (current), religious make-up variables, regional dummies (see Appendix A for details of variable descriptions).
Source: The Author

However, while the results in Table 1.01 are consistent with the model's theoretical expectations, they remain a relatively limited test of its robustness. Firstly, if the model is correct, it should be the case that (1) these three measures of the EDD/NEDD ratio are measuring the same underlying latent variable (extensiveness of government); and 2) while the most robust control variables were utilized, it is essential to include other control variables that may affect these results. Given the small sample size, it is not possible to introduce all the potential control variables using the OECD country sub-set alone (due to the problem of model saturation/lack of degrees of freedom), and therefore it becomes essential to utilize a larger dataset.

Advanced Regression Analysis (Positive Test)

Using either the identification strategy encapsulated in expressions (4.07) or (4.08), the high-income or pooled dataset, and the different combined measures of limited government (additive index and confirmatory factor analysis results), it is possible to determine, with greater confidence, whether the predictions of the model can robustly anticipate empirical outcomes. This is because not only is the use of an overall index of limited government more likely to convey a country's actual (multi-dimensional) EDD/NEDD ratio, but the use of a larger sample also allows all major theoretically and empirically identified determinants of rent extraction to be controlled for, thus reducing the risk of omitted variable bias. However, as noted above, given that the model does not provide a basis for predicting appropriate weights for the different variables, measurement error is a concern. The use of two different measures of the limited government, several different robustness tests, and the ability to compare the results with the results in Table 1.01 can be used to assess the validity of the findings. In this case, if the theoretical predictions are correct, the results below should be significant and not qualitatively different from the above-noted findings.

Table 1.02 reports the results of seven different regression specifications used to examine the theoretical expectations derived from the model. Irrespective of the specification used, the results are the same. As anticipated by the model and the theory, more limited government (a higher EDD/NEDD ratio) in an advanced income democratic context is associated with less perceived rent extraction. Specifically, these results remain robust despite the use of: (1) different independent variables (additive versus factor); (2) different sample size (OECD only versus pooled sample/all observation); (3) different distributional assumptions (GLM versus OLS versus Ordered Probit); (4) different robustness tests (reweighting observations to eliminate outliers); and (5) the inclusion of different control variables (Basic Controls, All additional Controls, Coordinated Capitalist Economies; see above and Hamilton 2012 for details).

Regression Model 1 of Table 4.03 is the simplest model possible, and conveys how the additive index of limited government (higher EDD/NEDD ratio) affects the level of perceived rent extraction utilizing only the most basic control variables, and restricted to the sub-sample of OECD countries. The results, which are significant at the 1% level and consistent with the theoretical expectations of the model, suggest that more limited government (a higher EDD/NEDD ratio) is associated with less perceived rent extraction. Regression Model 2 is identical to Regression Model 1, but also includes a control for 'coordinated capitalist economies' in which peak organizations play a critical role in policy-making (Hall and Soskice, 2001). These may, therefore, provide an alternative incentive for public policy-makers to minimize their rent extraction (Olson, 1981). While this control has the expected negative sign (more peak organizations engender less rent extraction) the results are insignificant and do not alter the basic result of the Regression Model 1. Here, a higher EDD/NEDD ratio is associated with less rent extraction. Utilizing the factor analysis measure of limited government (higher EDD/NEDD ratio), Regression Model 3 yields the same qualitative results, indicating that measurement error due to miss-specified weights may not be a major problem. Once again, the dependent variable, assuming it is ordinal and discrete, rather than interval and continuous (Regressions 4 and 5) has no effect on the results which are still significant at the 1% level, and have the theoretically anticipated sign. Utilizing the pooled dataset and all possible determinants of rent extraction identified in the literature (Regression Model 6 and 7) also does not affect the results, which remain significant at the 1% level. Finally, Regression Model 8 shows the importance of the macro-level context. As both the interaction term of the EDD/NEDD ratio and a high-income and democratic context and the independent effect of both the EDD/NEDD ratio and a high-income democracy context, are all negative and significant on the level of perceived rent extraction. Furthermore, when utilizing the subsample of countries that are not high-income democracies (not shown), the EDD/NEDD ratio is positive and statistically significant. The reasons for this may be multiple (government extensiveness may be correlated with state capacity in some developing countries) and it is beyond the scope of this work to investigate. However, the fact that the effect of the EDD/NEDD ratio in high-income democracies differs from non-high-income democracies clearly demonstrates the importance of how macro-contextual and meso-contextual factors may have different interaction effects.

Table 1.02 Extensive Regression Analysis (High-Income Democracies)

	Corruption Perceptions Index (CPI)							
	(1) (GLM)	(2) (GLM)	(3) (GLM)	(4) (OP)	(5) (OP)	(6) (GLM)	(7) (IRLS)	(8) (GLM)
	Additive	Additive	Factor	Additive	Factor	Additive	Additive	Factor
Higher EDD/ NEDD* DEM								-0.58* (0.34)
Higher EDD/ NEDD Ratio	-0.55*** (0.08)	-0.51*** (0.12)	-1.21*** (0.28)	-1.91*** (0.43)	-3.22*** (0.84)	-0.31*** (0.10)	-0.31*** (0.06)	-0.31*** (0.06)
High-Income Democracies								-0.78** (0.31)
Coordinated Market Economies		-0.35 (0.50)						-0.17 (0.35)
Standard Controls	√	√	√	√	√	√	√	√
Additional Controls						√	√	√
Sample	High-Income Dem	High-Income Dem	High-Income Dem	High-Income Dem	High-Income Dem	All	All	All
Number of Observations	19	19	19	19	19	52	52	52
(Pseudo Log)-Likelihood	-6.04	-6.03	-6.10	-35.78	-39.59	-19.81	NA	-19.97

Note: robust standard errors in parentheses. Dependent variable converted into fractional form for GLM estimations. OLS results are: -1.94** (0.71), -0.046** (0.021) for models' (1) and (5) respectively Standard controls: age of democracy, education attainment, latitude, (log) per capita income, and economic openness (long-term). Additional controls: Ethno-linguistic fragmentation, income inequality, (log) population, size of extractive industries, democratization (current), demographic dummy variables, economic openness (current), religious make-up variables, regional dummies (see Appendix A for details). Varieties of Capitalism Control is a dummy variable which takes the value of one for 'Coordinated Capitalist Economies.' (see Appendix A for details).* Significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level.[34] *Source: The Author*

The results in Table 1.02 do not only hold for high-income democracies, but also for democracies in general[35]. As Table 1.03 indicates, when replicating the regression models using the sub-sample of all effective democracies, rather than just high-income democracies (Regression Models 1-5), the results remain qualitatively the same. Namely, the EDD/NEDD ratio is robustly and negatively associated with less rent extraction. The magnitude of this effect, though, is diminished in all the regression models (compare Regression Models 1-5 in Tables 1.02 and 1.03), and, with respect to the ordered probit models (Regression Models 4 and 5), the results are significant at the 5% rather than the 1% level. In summary, independent of the sub-sample of countries used, the robust negative association between the EDD/NEDD ratio and the level of rent extraction predicted by the model remains robust.

[34] Running the regressions to include bureaucratic salaries controls increases the robustness of the EDD/NEDD index. Running regression 4 using a ranking of bureaucratic salaries (n=18) yields an EDD coefficient of -2.41 (0.80), significant at the 5% level. The rank on bureaucratic salaries is not significant.

[35] All countries in the dataset classified, by Freedom House (2011) as democracies.

Table 1.03 Extensive Regression Analysis (Democracy Sub-Sample)

	Dependent Variable: CPI				
	(1) (GLM)	(2) (GLM)	(3) (GLM)	(4) (OP)	(5) (OP)
	Additive	Additive	Factor	Additive	Factor
Higher EDD/NEDD Ratio	-0.32*** (0.069)	-0.28*** (0.12)	-0.65*** (0.17)	-0.57** (0.22)	-0.99** (0.48)
Coordinated Market Economies		-0.57** (0.24)			
Standard Controls	√	√	√	√	√
Sample	Democracy	Democracy	Democracy	Democracy	Democracy
Number of Observations	28	28	28	28	28
(Pseudo Log)-Likelihood	-10.11	-10.29	-10.21	-66.15	-66.14

Note: robust standard errors in parentheses. Standard Controls: Age of democracy, education attainment, latitude, (log) per capita income, and economic openness (long-term). Varieties of Capitalism Control is a dummy variable which takes the value of one for 'Coordinated Capitalist Economies'* Significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level. See Appendix A for details). *Source: The Author*

Aside from the EDD/NEDD ratio itself, the standard set of controls includes mechanisms that might capture the existence of alternative oversight mechanisms. The standard controls include the age of a democracy, controlling for the fact that democratic learning and institutionalization may affect the efficacy of elections. Furthermore, the controls include the Gastil Index whose civil liberties component controls for the existence of a free media and the ability of civil society to operate independently of government. This controls for some other critical contextual variables that may affect the efficacy of elections (Freedom House, 2011).

Apart from these broad contextual variables that may affect both EDD and NEDD, it is also necessary to control for NEDD-specific, non-electoral oversight mechanisms, as these may provide effective substitutes for electoral control. To do so, the paper uses the Index of Executive Oversight, an interval indicator (ranging from 0-9) constructed by Hamilton and Stapenhurst (2009) using data on the following factors to determine to what extent the non-elected elements of a polity are under the supervision of elected officials/voters at large: (1) the existence and powers of a parliamentary public finance committee (0-3); (2) the ability of elected officials to summon and scrutinize the actions of un-elected officials (0-2); (3) the ability of elected officials to censure and dismiss members of the executive (0-2); (4) the existence of an Ombudsperson (0-1); and (5) the existence of an Access to Information Law (0-1). In addition to this measure, it is also possible to use the World Bank's indicator for Government Effectiveness as a potential measure of the existence of oversight mechanisms faced by NEDDs. While, this measure is usually used as a measure of rent extraction (e.g. Persson and Tabellini, 2003), the index is in fact supposed to be measuring the extent to which non-elected policy-makers are independent of political control (World Bank, 2010). Therefore, while caution needs to be exercised in interpreting the results, it is possible to use this measure as a robustness check, to see whether the existence of an efficient non-electoral mechanism of oversight, associated with an independent non-elected public sector, is in fact associated with less perceived rent extraction.

As Table 1.04 shows, controlling for the existence of non-electoral oversight mechanisms does not alter the basic results, which remain the same: the EDD/NEDD ratio exhibits a highly statistically significant and negative effect on rent extraction, especially in high-income democracies. Consistent with the large literature on the importance of oversight, both the Index of Oversight and the measure of Government Effectiveness are also associated with reduced rent extraction. These findings suggest that while non-electoral mechanisms clearly play a role in determining rent extraction, they do not affect the role played by the EDD/NEDD ratio, which continues to exercise a large independent effect.

Table 1.04 Extensive Regression Analysis with Additional Bureaucratic Control Mechanisms (High-Income Democracy Sub-Sample)

	Corruption Perceptions Index		
	(1) (GLM)	(2) (GLM)	(3) (GLM)
	Additive	Additive	Factor
Higher EDD/NEDD* DEM			-0.60* (0.33)
Higher EDD/NEDD Ratio	-0.50*** (0.06)	-0.46*** (0.10)	-0.30*** (0.09)
High-Income Democracies			-0.82** (0.27)
Oversight Index	-0.30** (0.10)	-0.23* (0.12)	
Government Effectiveness		-1.02*** (0.09)	-1.00*** (0.05)
Coordinated Market Economies	-0.33 (0.48)	-0.34 (0.39)	-0.17 (0.35)
Standard Controls	√	√	√
Additional Controls			√
Sample	High-Income Dem	High-Income Dem	All
Number of Observations	19	19	52
(Pseudo Log)-Likelihood	-6.00	-6.86	-19.00

Note: robust standard errors in parentheses. Dependent variable converted into fractional form for GLM estimations. Age of democracy, education attainment, latitude, (log) per capital income, and economic openness (long-term). Varieties of Capitalism Control is a dummy variable which takes the value of one for 'Coordinated Capitalist Economies'* Significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level. See Appendix A for details of variable descriptions). *Source: The Author*

The Effect of the EDD/NEDD Ratio on Non High-Income Democracies? (Negative Test)

A final test of the robustness of the model is whether the consistent relationship between the EDD/NEDD ratio and its component parts remains a significant determinant of rent extraction in the sub-set of countries that are not high-income democracies. The model and its antecedent literature assume that a higher EDD/NEDD ratio, and by extension all of its component measures, should be *consistently* associated with less perceived rent extraction. It follows, then, that if the model is correct, this conditional effect should break down when the EDD/NEDD ratio is used, to predict variation in rent extraction in non-high-income democracies.

This is because the micro-theoretical assumptions of the theory postulate that the EDD/NEDD ratio affects the efficacy of elections, and that means high-income democracies, based on the antecedent literature. Therefore, it is anticipated that, while individual component measures of the EDD/NEDD ratio may be positively or negatively associated with variation in rent extraction among non-high-income democracies, increments in the EDD/NEDD ratio as a whole should not be negatively and robustly able to predict variation in rent extraction in the absence of a high-income democracy context. This is because the efficacy of elections is non-existent and cannot, therefore, be affected by the EDD/NEDD ratio.

As Table 1.05 indicates, the empirical evidence is consistent with this theoretical expectation. The individual measures of the EDD/NEDD ratio (low regulatory density and the inverse of government spending[36]) are inconsistently but significantly (at the 1% and 5% level respectively) associated with less and more rent extraction (Regression Models 1 and 2). Interestingly, the interaction term between the EDD/NEDD ratio and whether a country is not a high-income democracy is positive, and just statistically significant (at the 10% level), a result that suggests that in a non-high-income democracy context, a higher EDD/NEDD ratio is associated with more rent extraction (Regression Model 3). It is beyond the scope of this analysis to speculate as to why this may be. For example, it may be the case that some components of the EDD/NEDD ratio (inverse of government spending) may be associated with state capacity. Regardless of this, these results provide additional support for the theoretical model, as they clearly demonstrate that only within a context of a strong and stable electoral context (high-income democracy sub-set) does the EDD/NEDD ratio reduce the level of rent extraction.

Table 1.05 The Individual Measures of Limited Government (EDD/NEDD Ratio) and Rent Extraction in Non-High-Income Democracies

	Corruption Perceptions Index (CPI)		
	(1) (GLM)	(2) (GLM)	(3) (GLM)
	Raw Score	Raw Score	Additive
EDD* Non-High-Inc Dem			0.51* (0.26)
Regulatory Density	-7.65*** (2.01)		
Small Govt		3.32** (1.48)	
EDD/NEDD Ratio			-0.33 (0.25)
Non-High-Inc Dem			0.78*** (0.32)
Basic Controls	√	√	√
Additional Controls			√
Sample	Non-High-Income Dem	Non-High-Income Dem	All
Number of Observations	22	22	52
Log-Likelihood	-9.34	-9.05	-19.91

Note: robust standard errors in parentheses. Standard Control: Age of democracy, education attainment, latitude, (log) per capita income, and economic openness (long-term). Additional controls: Ethno-linguistic fragmentation, income inequality, (log) population, size of extractive industries, democratization (current), demographic dummy variables, economic openness (current), religious make-up variables, regional dummies (see Appendix A for details). * Significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level. CPI score divided by 10 to aid interpretation. OLS results are -0.009 (0.0055); 0.19*** (0.06); 0.14* (0.081), for the interaction term-for models (1), (2) and (3) respectively. See Appendix A for details of variable descriptions. *Source: The Author*

Overall, the finding of the regression analysis suggests that in a high-income democracy context, consistent with the model, in which retrospective evaluation of incumbents is most likely to be feasible, a higher EDD/NEDD ratio is associated with less rent extraction, as the model introduced above and its antecedent

[36] As membership of the EU is confined to high-income democracies in this dataset (Persson and Tabellini's dataset and measures were developed before the 2004 enlargement of the EU) the non-EU component cannot be used, as no non-high-income democracy is a member and, therefore, there is no variation in this variable.

literature would anticipate. These findings remain robust, irrespective of the use of different dependent variable specifications, distributional assumptions, omitted variables (small/large datasets), or outlier observations.

Do Voters Use the EDD/NEDD Ratio to Explain the Level of Political Rent Extraction?

Do voters really use the EDD/NEDD ratio to anticipate the level of rent extraction? So far this paper has shown that perceptions of the behavior of EDDs by elite experts vary, as anticipated, given the EDD/NEDD ratio. However, an additional test of the robustness of the theory is to examine whether in fact voters perceive that the EDD/NEDD ratio affects the average level of rent extraction in 'political life.' If the model is correct, and rent minimization occurs in the first stage due to the anticipated ability of voters to retrospectively punish/reward only EDDs (second stage), this outcome should also be observed. This is because voters can use the EDD/NEDD ratio to infer the proportion of senior policy-makers insulated from the incentives of elections, and will thus use this to infer the magnitude of rent extraction in political life (positive test). Furthermore, if this assumption of the model is correct, it should also be the case that perceptions of the level of rent extraction undertaken by policy-makers far removed from the control of elected officials, should not be predicted variation in the EDD/NEDD ratio, as such activities are rarely directly handled or supervised by elected officials (e.g. petty street level corruption) (negative test).

It is relatively easy to identify the sort of activities likely to fall (or potentially fall) under the oversight of elected officials, and those activities that will, even in high EDD/NEDD ratio countries, fall under the control of NEDDs. Rent extraction involving the passage of legislation, the abuse of parliamentary allowances, illicit payments to elected officials by lobbyists etc. are clearly the preserve of elected officials. Conversely, the demand for petty bribes to undertake routine administrative tasks, administrative malpractice (at the local level) etc., are the preserve of bureaucrats who are, at least in high-income democracies, far removed from the direct oversight of elected officials[37].

Of course, on the margin, many activities can be undertaken by either bureaucrats or elected officials. Thus, laws may be passed by the legislature but formulated primarily by elected officials or bureaucrats (as determined by the EDD/NEDD ratio). Therefore, rents perceived to be associated with 'political life' (broadly defined to include macro-level governance, e.g. the making of legislation or 'grand political corruption') should be determined by the EDD/NEDD ratio, since a greater control of these activities by elected versus unelected officials affects the magnitude of career concerned rent minimization. Conversely, even if oversight of the bureaucracy is substantial, many everyday occurrences of 'petty' (family or personal) rent extraction are only very indirectly associated with elected officials. It is, therefore, irrational to expect voters to attach much significance to the competency of elected officials if lower level bureaucrats, not directly or easily accountable to elected officials, are held responsible for the actions of such actors.

Using the data from the Global Corruption Barometer (Transparency International, 2011) it is possible to examine whether voters' perceptions of rent extraction in different policy domains does in fact conform to these predictions. The specific questions of interest are: (1) 'Corruption is a significant problem in political life' (yes/no/don't know) and (2) 'Corruption is a significant problem in personal/family life' (yes/no/don't know). Both questions are focused on corruption rather than the broader issue of rent extraction, which potentially generates measurement error and means that the results need to be treated with caution. However, despite this, the empirical evidence does conform to the expectations of the model.

As Table 1.06 shows, whether utilizing either the Additive or Factor measures of the EDD/NEDD ratio as well as the vector of all basic control variables, the results are consistent with the hypotheses generated by the theoretical model. Namely, the EDD/NEDD ratio robustly predicts declines in perceptions of rent extraction in the case of political life (Regression Model 1 and 2) but not in the case of rents in everyday life (Regression Models 3 and 4).

[37] A point now conceded even by the 'congressional dominance literature' (see Muller, 2001, pp. 386-405).

Table 1.06: The Determinants of Voters' Perception of Rent Extraction

	Corruption is a Problem in Political Life (Proportion)		Corruption is a Problem in Personal/Family Life (Proportion)	
	(1) (GLM)	(2) (GLM)	(3) (GLM)	(4) (GLM)
	Additive	Factor	Additive	Factor
Higher EDD/NEDD Ratio	-0.16** (0.067)	-0.36** (0.16)	0.0083 (0.092)	0.026 (0.21)
Varieties of Capitalism	0.53* (0.28)	0.58** (0.28)	-1.32*** (0.41)	-1.31*** (0.42)
Economic Openness (Long-Term)	-4.51*** (1.33)	-5.04** (1.99)	5.17*** (1.76)	5.17*** (1.60)
Latitude	-5.06*** (1.82)	-5.68*** (1.91)	1.30 (2.18)	1.37 (0.69)
(log) Per capita income	-0.77* (0.40)	-0.95 (0.87)	-0.11 (0.65)	-0.12 (0.64)
School Enrolment	-0.017 (0.18)	-0.021 (0.017)	0.031 (0.023)	0.030 (0.022)
Sample	High-Income OECD	High-Income OECD	High-Income OECD	High-Income OECD
Number of Observations	17	17	17	17
(Pseudo Log)-Likelihood	-7.18	-7.23	-4.40	-4.42

Robust standard errors in parentheses. * Denotes significant at the 10% level, ** significant at the 5% level, ***significant at the 1% level. See Appendix A for details of variable descriptions. *Source: The Author*

Conclusion

The aim of this paper was to contribute to understanding the determinants of rent extraction, especially in high-income democracies in which variations in rent extraction persist but cannot be explained by the lack of either long-established democratic institutions or socio-economic development. Utilizing the insights of recent developments in the economic voting literature, specifically the substantive Duch-Stevenson model, in conjunction with a game-theoretic, career concerned modeling framework, it was possible to derive new hypotheses regarding the determinants of rent extraction. Specifically, the model anticipated that a higher EDD/NEDD ratio in democratic contexts would be associated with less rent extraction as electorally accountable and career-concerned office holders would be incentivized to minimize their short-term rent extraction and voters would be able to re-elect only high competency incumbents.

Consistent with these theoretical expectations the EDD/NEDD ratio was associated with: (1) lower levels of rent extraction in the sub-sample of countries identified as high-income democracies; and (2) in the pooled dataset, only associated with lower levels of rent extraction as part of an interaction effect with high-income democracies. Thus, the EDD/NEDD ratio is robustly associated with variations in rent extraction for the sub-sample of countries that are considered high-income democracies. While future research needs to focus on examining the micro-level empirical implications of the model in more detail, the fact that the macro-level results obtained above are consistent with the insights of both: (1) the economic voting literature; and (2) the empirical finding that a high-income democratic context is associated with less rent-extraction; provides a critical first step in justifying future research along this line of inquiry.

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Appendix A: Description and Details of the Dependent, Independent and Control Variables

Descriptive Statistics of All Variables (High-Income OECD Only)

Dependent Variables & Controls						
Variable	**Observation**	**Mean**	**Std. Dev**	**Min**	**Max**	**Variable Type**
Corruption Perceptions Index	23	2.16	1.57	0.26	5.77	Interval/Ordinal
Control of Corruption	23	1.88	0.95	0.74	3.66	Interval/Ordinal
Tickets	18	2.17	4.74	0.00	14.80	Interval
Age of Democracy	23	0.45	0.23	0.11	1.00	Interval
Economic Openness (Long-Term)	23	0.77	0.15	0.20	1.00	Interval
Geographic Latitude	23	41.50	25.35	-36.89	63.89	Interval
(Log) Per Capita Income	23	9.52	0.25	8.85	9.94	Interval
Education Enrolment	23	104.90	7.35	88.88	117.11	Interval
Ethnolinguistic Fragmentation	23	0.12	0.11	0.0025	0.37	Interval
Income Inequality	22	32.43	4.07	25.50	39.86	Interval
(Log) Population	23	2.51	1.65	-1.321	5.56	Interval
Democratization (Current)	23	1.17	0.25	1.00	1.83	Interval
Proportion of Pop 14-64	23	66.64	1.67	63.48	69.37	Interval
Proportion of Pop over 64	23	14.31	1.71	11.27	17.43	Interval
Economic Openness (Current)	23	68.90	38.09	18.75	188.98	Interval

Catholic (%)	23	43.05	38.37	0.10	96.90	Interval
Protestant (%)	23	32.52	35.59	0.10	97.80	Interval
Confucian Majority (Dummy)	23	0.04	0.20	0.00	1.00	Dichotomous
Latin America Dummy	23	0.00	0.00	0.00	0.00	Dichotomous
Africa Dummy	23	0.00	0.00	0.00	0.00	Dichotomous
Asia Pacific Dummy	23	0.04	0.20	0	1	Dichotomous
Time Since Independence (Years)	23	190.43	74.35	55.00	250.00	Interval

Source: The Author

Independent Variables of Interest						
Variable	**Observation**	**Mean**	**Std. Dev**	**Min**	**Max**	**Variable Type**
Inverse of the Size of Government (%) (Size of the Private Sector)	23	63.12	8.52	48.82	79.49	Interval
Regulatory Quality	23	1.37	0.36	0.60	1.90	Interval
Non-EU (Dummy)	23	0.35	0.49	0.00	1.00	Dichotomous
EDD/NEDD (Additive)	23	1.83	0.55	1.28	2.66	Interval
EDD/NEDD Latent	23	-0.01	0.86	-1.07	1.46	Interval
Coordinated Capitalist Economies	23	0.39	0.50	0.00	1.00	Dichotomous
Government Effectiveness	23	1.70	0.36	0.90	2.10	Interval
Executive Oversight Index	23	4.00	3.89	1.00	0.70	Interval
Corruption in Political Life (% of Respondents)	17	39.91	17.92	7.10	74.40	Interval
Corruption in Family Life (% of Respondents)	17	17.00	13.01	1.90	42.50	Interval

Source: The Author

The Regulatory Quality Indicator is a sister indicator of both the Control of Corruption and Government Effectiveness Indicator (see Hamilton 2012 for details regarding its construction). As such, it is an interval measure that captures the level of regulatory density, meaning the extent of distortions and number of regulations that ranges from -2.5 (most distortionary and unnecessarily expansive regulations) to 2.5 (least distortionary and unnecessarily expansive regulations). As the Table below shows, the indicators' representative sources are clearly focused on measuring regulatory density in the manner understood by Duch and Stevenson (2008). In fact, many of the questions used to construct the index (such as whether foreign competition is treated equally, the existence of discriminatory regulations etc.) are very similar to those used by the Fraser Institute to measure the density of rent extraction used in the original Duch-Stevenson model (Frasier Institute, 2010).

The Regulatory Quality Indicator

Source	Who Was surveyed/asked?	Question/Assessment of	Source Type
Economist Intelligence Unit Risk-wire & Democracy Index	Expert Staff	'Unfair competitive practices; Price controls; Discriminatory tariffs; Discriminatory taxes; Excessive protections;'	Commercial Business Information Provider
World Economic Forum Global Competitiveness Report	Survey- Senior business leaders; domestic and international companies	'Administrative regulations are burdensome; Tax system is distortionary; Import barriers/cost of tariffs as obstacles to growth; Competition in local market is limited; It is easy to start a company; Anti monopoly policy is lax and ineffective; Environmental regulations hurt competiveness;'	Non-Government Organization
Heritage Foundation	Expert Staff	'Foreign investment; Banking/finance;'	Non-Government Organization
Institutional Profiles Database	Expert Staff	'Ease of starting a business; Administered prices and market prices Competition: ease of market entry for new firms; Competition between businesses: competition regulation arrangements'	Government
Political Risk Services International Country Risk Guide	Expert Staff	'Investment Profile '	Commercial Business Information Provider
Global Insight Business Conditions and Risk Indicators	Expert Staff	'Tax Effectiveness How efficient the country's tax collection system is. The rules may be clear and transparent, but are they Legislation An assessment of whether the necessary business law s are in place, and whether there any outstanding gaps '	Commercial Business Information Provider

Source: The World Bank (2011)

The EDD/NEDD Ratio by Country (OECD Only)

Country	EDD/NEDD Ratio (Standardised Additive Measure)	EDD/NEDD Ratio (Confirmatory Factor Analysis)
Australia	2.60	1.22
Austria	1.45	-0.51
Belgium	1.33	-0.93
Canada	2.61	1.27
Denmark	1.49	-0.49
Finland	1.51	-0.40
France	1.33	-0.80
Germany	1.51	-0.11
Greece	1.40	-0.28
Iceland	2.52	0.90
Ireland	1.49	-0.39
Italy	1.28	-0.99
Japan	2.54	1.46
Luxembourg	1.46	-0.50
Netherlands	1.39	-1.07
New Zealand	2.56	0.70
Norway	2.45	0.47
Portugal	1.41	-0.59
Spain	1.47	-0.30
Sweden	1.39	-0.75
Switzerland	2.61	1.19
UK	2.66	1.44
USA	1.51	-0.50

Spearman rank correlation between the two measures=0.85 *Source: The Author*

Appendix B Alternative Mechanisms of Oversight for NEDDS

While it is beyond the scope of this thesis to examine the role of alternative mechanisms of oversight of NEDDs, it is useful to demonstrate the robustness of the baseline model's results by briefly examining whether these results hold, even in contexts where alternative mechanisms of oversight exist. The fact that the basic results do hold therefore increases the confidence one can have in the usefulness of the model in a variety of contexts.

As a large literature in positive political economy (especially the Congressional Dominance Literature; see Horn, 1995) has shown, NEDDs may be subject to a host of non-electoral mechanism of incentivization, which may work in a manner analogous to elections in order to incentivize career concerned rent-minimization, and the selection of higher competency incumbents. Let ϕ be the probability that, due to the existence of non-electoral mechanisms, below-average competency NEDD policy-makers can be removed from office after the first period has ended if their level of rent extraction is deemed to be excessive; that is, a level of rents associated with an office holder with a below-average competency. This is because publicly-financed goods and services are a residual category of taxation after rents have been extracted (see expressions 1.01-1.16). As before, the competency of the non-electorally-dependent policy-maker is common knowledge at the end of the first period. However, now the non-electorally dependent policy-maker's decision about the level of rent extraction is conditional on her anticipation of the fact that a rent-maximizing strategy might not be optimal. Thus, the NEDD's budget constraint (1.06) becomes:

$$\beta\tau y - r_{j1} - \phi\chi\delta(R+\bar{r}) \geq 0 \tag{1.26}$$

Now differentiating the utility of NEDDs, w_j, subject to (3.32) only yields the corner rent-maximizing solution (3.16) in the special case when $\phi = 0$1, as the NEDD is now facing a trade-off between maximizing rents now, and possibly losing policy-making power in the second period; that is, (3.17) becomes:

$$\beta\tau y = r_{j1} + \phi\chi\delta(R+\bar{r}) \tag{1.27}$$

Tax revenues therefore controlled by NEDDs are allocated, taking into account the career concerns of the NEDDs. Obviously, if $\phi = 0$, then (1.28) is the same as (1.08)- $\beta\tau y = r_{j1}$. Thus, differentiating with respect to ϕ yields the intuitive result that the more easily NEDDs can be removed from office, the more likely they are to pursue a rent-minimizing strategy.

However, while non-electoral, NEDD-specific, removal mechanisms may mitigate the rent-maximizing incentives of NEDDs, unless $\phi = 1$, such mechanisms will not be as effective as elections in incentivizing career concerned short-term rent-minimization. To see this, consider aggregate first period rents (3.24) when EDDs face elections and NEDDs face non-electoral removal mechanisms for poor performance:

$$r_{ij1} = (\alpha\bar{\tau}y - \chi\delta(R+\alpha\bar{\tau}y)) + ((1-\alpha)\bar{\tau}y - \phi\chi\delta(R+\bar{r}(1-\alpha)\bar{\tau}y) \tag{1.28}$$

Unless $\phi = 1$, $|\chi\delta(R+\alpha\bar{\tau}y)| > \chi\delta(R+(1-\alpha)\bar{\tau}y)$, NEDDs will be marginally less career concerned than EDDs. Even when faced with alternative mechanisms of oversight, it is only under very restrictive assumptions that such mechanisms will provide as strong an incentive mechanism as the existence of regular elections. This conclusion is very much in line with the large body of literature. It suggests that while elections may not be sufficient to eliminate rent extraction, they are the cornerstone – or at least the essential prerequisite – for it, just

as Olson (1981) argued that regular elections allow large latent groups to curb excessive rent extraction. While alternative control mechanisms, such as career progression, legislative oversight etc. (McCubbins et al, 1988) might render non-elected policy-makers more accountable, such mechanisms may increase the power of narrow rent-seeking groups rather than voters in general (who are rationally ignorant of the specific activities of individual ministries). This means not necessarily aligning the interests of NEDDs with those of the bulk of voters, who rely on elections, to incentivize and select those office-holders most likely to be of a high competency.