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The Timing of Sovereign Defaults over Electoral Terms

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Abstract

I construct a database that maps the timing of sovereign default decisions into elected politicians' terms of office, that provides an empirical means of investigating political economy theories of sovereign default. I find no robust patterns in the timing of default decisions over terms of office. I also find no evidence in support of the political reputation theory of sovereign debt repayment. Finally, there is some tentative evidence that elected leaders who default are also those more likely to be re-elected. Motivated by anecdotal evidence, I use a stylised model of political leaders with career concerns to demonstrate how this can occur when politicians care about re-election.

Keywords: Sovereign default, electoral cycles, career concerns
JEL Classification: F34, H63

*The views in this paper are solely the responsibility of the author and should not be interpreted as reflecting the views of the Board of Governors of the Federal Reserve System or of any other person associated with the Federal Reserve System.

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1 Introduction

It has been shown both theoretically and empirically that macroeconomic policy decisions are influenced by cycles of election and re-election, and that the timing of specific policies can reflect concerns about impending or receding elections (Rogoff and Sibert, 1988; Alesina et al., 1997). It follows naturally that the decision to enter into sovereign default may be affected by political economy considerations, and there is a good body of supporting theoretical research (Amador, 2004; Tomz, 2007; Cuadra and Sapriza, 2008). However, as noted by Panizza et al. (2009), comparatively little empirical analysis of the political economy of sovereign default has been conducted. In this paper, using a specially-constructed database that maps the timing of sovereign default decisions into democratic governments' electoral cycles, I empirically investigate two broad political economy theories of sovereign default: (i) that some types of government treat the decision to default differently; and (ii) that a reduced likelihood of re-election following a default is a direct cost that helps ensure sovereign debts are repaid.

I focus on three key results: first, that there are no significant patterns in the timing of default over elected politicians' terms in office. This suggests that elected politicians do not take default decisions strategically, in a game-theoretic sense, in order to improve their chances of re-election. For an elected leader, potential strategies may include defaulting in the run-up to an election as a signal of strong leadership or, if default is detrimental to the output of an economy, defaulting at a time when their political mandate is strongest - most usually in the immediate aftermath of an election. It is not therefore possible, a priori, to say with certainty what empirical patterns would be expected in default decisions over elected terms of office.

Second, I show there is no evidence that the defaults occurring in early periods of political tenure are correlated with good times, defined according to a variety of different measures. This finding contradicts a key implication of theories that some types of government treat the decision to default differently (Eaton, 1996; Tomz, 2007). In those models, governments are typically one of two types: 'good' governments only default in poor economic circumstances (bad times), while 'bad' governments are willing to default irrespective of economic circumstances. The choice of government is typically modeled as a reduced form stochastic process over types which generates uncertainty about future types, but lenders are nevertheless willing to extend sovereign credit, while charging a premium, because they get repaid with some probability. The empirical corollary is that all sovereign defaults in good times are also those that occur early in a term of office, because those decisions must have been taken by bad governments which default in all

times.

Third, I demonstrate a weakly *positive* relationship between elected leaders who default and those who are re-elected. This finding builds on Borensztein and Panizza (2010) but draws distinction from the default decisions of unelected leadership and controls for leaders that cannot be re-elected for institutional reasons, for example term limits. As in previous empirical work, I cannot establish the causal relationship between default and re-election. Instead I use anecdotal evidence to motivate a model-based explanation where political leaders inherit a debt burden, that may or may not have been at the social welfare maximising level, and must decide whether or not to default.

The stylised model draws from the theoretical literature of experts with career concerns.[1] I explicitly distinguish two types of politician: those who have as much information as the average voter and are unaware which actions deliver the aggregate social optimum (incompetent); and those that perfectly know how much debt they should contract and when they should default (competent). Since both types know which they are in advance, the first best outcome is that only competent politicians would be elected. However, voters neither observe the optimal default decision, nor the optimal debt contracting decision. This asymmetric information allows the incompetent politician to pretend to be competent, in the hope of being re-elected, but ex-post utility allows voters to update a prior and learn about the competence of the politician over time.

I show the existence of a perfect Bayesian equilibrium where an incompetent politician pursues a strategy of pretending to be competent: he chooses a level of debt randomly. He is re-elected with positive probability because he sometimes makes the correct decision. At the heart of the model is the assumption that a competent agent knows the socially optimal action to take. By acting in the social interest, the competent politician assures that he will be re-elected. An incompetent politician who doesn't know the state of the world, but wishes to be re-elected, is forced to choose a randomisation strategy and hope that he is mistaken for a competent agent. However, since sovereign default is rarely the socially optimal action in the model, the incompetent politician does not default as often as a competent politician. Therefore the decision to default reveals political competence and causes voters to re-elect the politician.

In preview, the paper begins by introducing the data in section 2.1; and presents the three key empirical results in sections 2.2–2.4. These are followed by some anecdotes on the political economy of default episodes in section 2.5 that motivate the model detailed

[1] For example, Holmström and Ricart i Costa (1986); Scharfstein and Stein (1990); Prendergast and Stole (1996) and Dasgupta and Prat (2006).

in section 3 which is then simulated in section 3.3. Lastly, I conclude the paper in section 4 with some remarks on alternative theories.

2 Empirical analysis

2.1 Data sources

The database population is defined as all countries that experienced at least one default in 1975-2005. Default events are defined according to Standard & Poor's general definition as the failure to meet a principal or interest payment on the due date (or within the specified grace period) contained in the original terms of a debt issue (Beers and Chambers, 2006). I identify the years when an economy first enters default on foreign bank, foreign bond and local currency debt, and search Lexis-Nexis for news reports on the default event to establish the month in which default is declared.[2]

These default events are mapped into a detailed electoral history of leaders and political parties compiled for each country using the African Elections Database, Database of Political Institutions, Georgetown Political Database of the Americas, Bingham University Election Results Archive and Adam Carr's Electoral Archive.[3] An example of a complete electoral history is given in Appendix A for Costa Rica.

For leaders without concern for the democratic process it is difficult to measure a strategic reaction.[4] In addition, Enderlein et al. (2011) argue that the stance of governments towards private creditors depends on whether the government is democratic or autocratic, suggesting it is more appropriate to study the strategic reactions of autocracies separately. Therefore, the focus of this paper is on the timing of defaults where political accountability is determined through regular democratic elections. Using the Polity IV democracy indicator, I sub-select country-years when this measure is greater than -3.[5] In order to ensure comparison across a homogenous elected group, I separate out default decisions taken by a leader who was not elected, for example those who came to power when an incumbent resigned or died.

[2] In the single case of Mongolia in 1997, it was not possible to find evidence for the month in which the default began.

[3] Some further details were gleaned from University of Essex' database on Political Transformation and the Electoral Process in Post-Communist Europe, UC San Diego's Latin American Election Statistics database and Wikipedia. I checked the timing of electoral terms against the data of Brender and Drazen (2008), where our countries and time periods overlapped.

[4] See Dhillon and Sjostrom (1997) for some theoretical work comparing democratic and autocratic default decisions.

[5] This is slightly different from the alternative (equally arbitrary) cut-off of zero more frequently used in the political economy literature, but it has no effect on the qualitative results of the paper. I choose this cutoff to include a few extra default decisions that were taken by leaders on the boundary of democracy/autocracy and would otherwise be excluded.

Table 1: Descriptive statistics of database

		per country			per country
Number of countries	36				
Years of democracy	689	19.1	Years in default	253	7.03
Elections	174	4.83	Defaults	57	1.58
New incumbents	132	3.67	'New' Defaults	45	1.25

Table 1 shows there are 36 countries in which default by a democratically elected leader has been recorded by Standard & Poor's. For these countries in total 174 elections took place and of those elections 132 (76%) returned new incumbents to office. Since most countries have a two-term limit for leadership, this is not a surprisingly high proportion. Although these countries spent a total of 253 years of democracy in default (37%), there were only 57 distinct periods when they entered into default on either foreign currency bank, foreign currency bond, or domestic currency debt. Moreover, only 45 of these declarations of default occurred when the country was not already in a state of default on some other obligations. I consider this latter group to be 'new' or 'surprise' defaults since the other 12 occurred in periods of time that had already been demonstrably financially stressful for the political leadership.

2.2 The timing of default over electoral cycles

The objective of this section is to investigate whether there is any evidence of patterns in the timing of sovereign default over electoral terms in office. There are prior empirical reasons why we should expect the risk of default to vary over the electoral cycle, but it is not clear whether we should expect more defaults to occur just before an election or just after a new incumbent is given leadership.

To allow common comparison, given cross-country variation in the length of a term in office, I divide each electoral cycle into four quarters. A quarter may correspond to a period of time ranging from one year (Costa Rica) to 1.5 years (Mexico), because electoral term length varies between countries. I assume every elected leader takes office expecting to retain power for four quarters of an electoral term.

Default events are mapped into the *expected* quarter of terms in office. Suppose, for example, a leader defaults in the twelfth month of a four year incumbency. Then, even if she resigns in her second year, the default is classified as occurring in the first quarter of her expected term in office. A complete table of defaults events, detailing country, year and quarter of electoral cycle may be found in Appendix B.

Leaders may not remain in power for all four quarters of their expected term in office, for example they may resign, die naturally or be assassinated, so we expect to observe more early quarters in the data.[6] This systematic pattern would cause us to observe more defaults in earlier quarters if defaults occurred with equal probability in all quarters. To control for this, I also compute and report in Table 2 the number of defaults relative to the number of quarters of all electoral leaders in the database during the period 1975-2005.

The expected quarters of terms in office are separated according to whether the politician is newly elected (first term) or has been re-elected. I report the division for all 57 defaults by an elected leader, and also for the 'new' defaults that occurred when the country was not already in a state of default. Finally, although the data frequency limit the strength of any conclusions, I also report the timing of default separately for parliamentary and presidential leaders. The literature has already documented a distinction between the willingness of these two groups to enter default (Kohlscheen, 2007; 2010), and it is therefore natural to investigate if there are differences in their timing of default that might reveal strategic differences between them.[7]

Simply counting the raw data suggests that there are more defaults occurring in leaders' first terms and earlier in those terms. However, the figures in parentheses show that, when scaled by their respective populations, there's no indication that new politicians prefer to default over re-elected incumbents, or that they are choosing to default early or late in their expected terms of office. In addition, the data show that no real distinctions can be drawn from the separation of the timing of defaults by presidential and parliamentary leaderships.

Finally, some leaders remain in power for two or more electoral terms, and patterns may be present over their second or subsequent terms of office because, for example, their political power has been well established. The second column in Table 3 shows the frequency of defaults over the entire lives of politicians. As in the previous case, however, we expect to observe more early quarters in the data as, systematically, more politicians are in power for early quarters. Once this is controlled for, using the same population measure as before, column four in the same table shows there is no significant difference in the timing of defaults over electoral lives.[8]

[6] Occasionally, leaders may stay in office beyond their expected term length by delaying calling an election. This causes the fourth quarter of their expected incumbency to be longer than the other quarters, but there is no systematic data pattern that will affect the results.

[7] Kohlscheen (2010) finds that presidential democracies are more likely to default and argues that constitutional differences mean presidents need not worry about losing votes of no confidence in their leadership.

[8] As a robustness exercise, I repeated the analysis of this section using the data of Arteta and Hale (2008), which yielded no new information in relation to the timing of defaults. The tabulations of results are in Appendix E.

Table 2: Timing of sovereign defaults over electoral cycles

	All Defaults		'New' Defaults	
	first term	re-elected	first term	re-elected
Q1	16 (0.13)	4 (0.10)	10 (0.08)	4 (0.10)
Q2	10 (0.08)	4 (0.10)	9 (0.07)	3 (0.08)
Q3	7 (0.06)	4 (0.11)	7 (0.06)	3 (0.08)
Q4	9 (0.09)	3 (0.10)	6 (0.06)	3 (0.10)

Q corresponds to an expected quarter of a term in office
Figures in parentheses are % of respective population

	Parliamentary New Defaults		Presidential New Defaults	
	first term	re-elected	first term	re-elected
Q1	3 (0.06)	3 (0.16)	7 (0.09)	1 (0.05)
Q2	6 (0.13)	0 (0.00)	3 (0.04)	3 (0.15)
Q3	1 (0.02)	1 (0.06)	6 (0.09)	2 (0.11)
Q4	2 (0.06)	1 (0.07)	4 (0.06)	2 (0.13)

Q corresponds to an expected quarter of a term in office
Figures in parentheses are % of respective population

Table 3: Timing of defaults over leaders' electoral lives

	All Defaults	'New' Defaults	Parliamentary New Defaults	Presidential New Defaults
Q1	15 (0.13)	10 (0.09)	3 (0.07)	7 (0.10)
Q2	11 (0.10)	10 (0.09)	6 (0.15)	4 (0.06)
Q3	9 (0.09)	8 (0.08)	1 (0.03)	7 (0.11)
Q4	10 (0.11)	6 (0.07)	2 (0.06)	4 (0.07)
Q5	2 (0.07)	2 (0.07)	2 (0.17)	0 (0.00)
Q6	3 (0.11)	3 (0.11)	1 (0.08)	2 (0.13)
Q7	3 (0.12)	2 (0.08)	0 (0.00)	2 (0.15)
Q8	3 (0.13)	3 (0.13)	1 (0.10)	2 (0.15)
Q9	1 (0.09)	1 (0.09)	1 (0.20)	0 (0.00)

Q corresponds to an expected quarter of a term in office
Figures in parentheses are % of respective population

2.3 Default in good and bad times

In this section, I show that there is no evidence that the defaults occurring during good times, defined according to a variety of different measures, are correlated with early periods of political tenure. This finding contradicts one implication of theories that postulate that

sovereign debt repayment depends on the 'type' of the government – that all defaults in 'good' times must occur in the early stages of the political incumbency. This is because political leaders of 'good' types either never default, or do so only in 'bad' times, whereas political leaders of 'bad' types will default at any time and be the only type to default in good times.[9] Therefore, all defaults in good times must occur in the early stages of political incumbency, since bad types will default promptly on taking power.

Table 4 shows the the timing of defaults using four different measures of good times. The first measure follows Tomz and Wright (2007) in defining good times as those when country-specific GDP growth is above trend, measured using a Hodrick-Prescott filter with a smoothing parameter set to 6.25.[10] The remaining three measures consider threshold values of indicators commonly used to signal a high debt burden - debt to export ratio above 20%, debt to GDP ratio above 200%, and reserve to debt ratio below 10%.[11] According to the literature discussed above, we expect to see that any defaults that occur during good times (without crises) will be in the early stages of a leader's incumbency. However, the columns show no evidence that defaults occurring in good times are weighted towards the earlier periods of an incumbency.[12]

2.4 The effect of default on re-election

This section presents an analysis of the partial correlation between entering into a state of default and the re-election of leaders that defaulted. It is not possible to identify the causal effect of a default on the re-election probability of a particular leader because of the low frequency of default events, and the absence of a convenient instrument. Nevertheless, the results address the question of what happened to a leader who defaulted in a particular quarter of his incumbency.

Let c denote a particular country, and t a particular year. Equation 1 shows the reduced form econometric specification used to identify the partial correlation of a default in a particular quarter of an electoral term with a leader's re-election, where X represents

[9] Eaton (1996) is the earliest theoretical paper to consider imperfect information available to creditors on the type of the government. His model suggests that all defaults would occur when the 'bad' type comes to power i.e. at the beginning of an incumbency. Tomz (2007) allows for three types of borrower - the stalwart always repays, the fairweather defaults only in 'bad' times, and the lemon defaults in both 'bad' and 'good' times.

[10] Similar results were obtained when using a smoothing parameter of 100.

[11] All of these indicators are taken from the World Bank's Global Development Finance database; not all countries in the sample have data available.

[12] As a robustness exercise, I repeated the analysis of this section using the data of Arteta and Hale (2008), which yielded no new information in relation to the timing of defaults. The tabulations of results are in Appendix E.

Table 4: Timing of defaults in good and bad times

	GDP Growth (6.25)		Debt-export ratio		Debt-GDP ratio		Reserve-debt ratio	
	Good times (above trend)	Bad times (below trend)	Good times (below 20%)	Bad times (above 20%)	Good times (below 200%)	Bad times (above 200%)	Good times (above 10%)	Bad times (below 10%)
Q1	8	12	3	13	8	8	9	7
Q2	4	10	3	6	5	4	7	2
Q3	5	6	5	6	6	5	8	3
Q4	7	5	3	7	3	7	4	6
Total (share)	24 (0.42)	33 (0.58)	14 (0.30)	32 (0.70)	22 (0.48)	24 (0.52)	28 (0.61)	18 (0.39)

Q corresponds to an expected quarter of a term in office

Timing of 'new' defaults in good and bad times

	GDP Growth (6.25)		Debt-export ratio		Debt-GDP ratio		Reserve-debt ratio	
	Good times (above trend)	Bad times (below trend)	Good times (below 20%)	Bad times (above 20%)	Good times (below 200%)	Bad times (above 200%)	Good times (above 10%)	Bad times (below 10%)
Q1	5	9	2	8	5	5	6	4
Q2	3	9	2	5	4	3	5	2
Q3	5	5	4	6	5	5	8	2
Q4	5	4	3	5	2	6	3	5
Total (share)	18 (0.40)	27 (0.60)	11 (0.31)	24 (0.69)	16 (0.46)	19 (0.54)	22 (0.63)	13 (0.37)

Q corresponds to an expected quarter of a term in office

a vector of control variables and α are country and year fixed effects.

$$\mathbb{1}(\textit{re-election})_{c,t} = \sum_{j=1}^{4} \beta_j \mathbb{1}(\textit{default in } Q_j)_{c,t} + \gamma X_{c,t} + \alpha_c + \alpha_t + \epsilon_{c,t} \tag{1}$$

The vector of control variables is based on those used by Brender and Drazen (2008) in their investigation into the relation between government spending, economic growth and political re-election.[13] The level and change in government final consumption expenditure, together with growth in GDP per capita are all obtained from the World Bank's database on World Development Indicators. The ratio of debt to GDP is obtained from the World Bank's database on Global Development Finance. In addition, I control for the level of democracy in a country using the quantitative measure 'polity' from the Polity IV Database. The lack of comprehensive availability of data for all countries and time periods necessarily restricts the coverage of this analysis and is the cause of the relatively lower number of observations. Additional restriction is imposed by requiring that the incumbent is eligible for election; this is important whenever term limits exist, since they legally prevent the re-election of certain incumbents.

The second column of Table 5 contains the result from an analysis using Ordinary Least Squares (OLS) and shows there is no significant relationship between the state of being in default and the probability of re-election, measured using a dummy variable for the years in which the economies were already in default. The third to fifth columns show the weak positive partial correlation between entering into a state of default and the probability of re-election. The eighth and ninth show similar results using logit and probit models; there is insufficient variation in both default and re-election in the presence of country fixed effects so they are necessarily omitted. For comparison, the seventh column shows the OLS results without country fixed effects.

As an additional investigation, I replace the dependent variable measuring the re-election of individual leaders with a dummy variable for the re-election of the incumbent political party. Since a political party may be re-elected even when a political leader may not (term limits do not apply), there is an increase in the number of observations available for study. The fifth column shows that there is no significant relationship between the re-election of political parties and entering a state of default, suggesting that the individual

[13]The analysis in this paper is different because Brender and Drazen (2008) analyse movements in variables in the year(s) around elections, whereas I consider defaults by quarter of expected incumbency, and the year-length of quarters varies by country. This might be a concern if agents are myopic and only recall the most recent year of their lives, but it seems reasonable that voters would recall when a leader took power and the major decisions - such as an external debt default - taken during their entire incumbency. When considering the effect of major decisions on the outcome of an election, one should then account for the entire term, not just proximate years.

leader is more important than party leadership in the minds of voters when an economy has just entered into default.

2.5 Anecdotal evidence on defaulters

The purpose of this section is to highlight key features of defaulting countries from three anecdotes that will be used to motivate a simple model that explains the empirical facts uncovered in the previous section. The features are that, first, a new incumbent typically inherits a debt burden; second, debt burdens do not have a common origin and this has implications for the default decision; and third, leaders that default may be re-elected. I relate the three anecdotes in reverse chronological order.

2.5.1 Dominican Republic, 2005

The incumbent government dealt with the banking crisis of 2003-4 by converting private sector losses into public sector debt, and printing money. The ensuing exchange rate depreciation caused GDP in dollar terms to fall which, together with the rise in debt, led to a dramatic increase in the debt-to-GDP ratio. Weak fiscal policies by the incumbent government further undermined confidence. Leonal Fernández took power in August 2004 and implemented reforms including a new tax package, cheaper oil from Venezuela, and in April 2005 restructured bond issues in an investor-friendly exchange. He was re-elected in August 2008. The following is an extract from the IMF's 2009 Article IV consultation:

> *A financial crisis in 2003 (fueled by the failure of several fraud-ridden banks) led to a generalized loss of confidence and a major bailout that doubled public debt. An SBA [Stand-by Arrangement] (2003-05) went quickly off-track. However, confidence improved after President Fernández took office in mid-2004 and his new administration designed a strong economic program supported by another SBA (2005-08) that successfully stabilized the economy. President Fernández was re-elected in 2008 and continued with broadly adequate macro policies...*

2.5.2 Suriname, 2001

The Surinamese economy began to weaken in 1999 and, in a response designed to re-stimulate it, Jules Wijdenbosch, the incumbent leader, loosened monetary and fiscal policies which generated a large amount of public debt. Rather than spend the raised debt on productive investment, however, he chose to spend it on civil service wages which generated inflation. Wijdenbosch chose not to run in the 2000 election that saw his closest rival in the previous election, Ronald Venetiaan, become the new incumbent. Venetiaan im-

Table 5: The correlation between defaults and re-elections

Est. Method	OLS	OLS	OLS	OLS	OLS	OLS	Logit	Probit
Dep. Var.	[1]	[1]	[1]	[1]	[2]	[1]	[1]	[1]
Q1		0.215	0.262**	0.263**	-0.0567	0.394**	3.214**	1.719**
		(0.168)	(0.116)	(0.126)	(0.215)	(0.198)	(1.347)	(0.710)
Q2		0.229	0.0903	0.0944	0.0944	0.225	1.583*	0.827
		(0.177)	(0.183)	(0.184)	(0.162)	(0.156)	(0.941)	(0.553)
Q3		0.0778	-0.0112	-0.0082	-0.0082	-0.0274	-0.286	-0.228
		(0.153)	(0.139)	(0.114)	(0.143)	(0.192)	(1.039)	(0.671)
Q4		0.0814	0.121	0.131	0.1305	0.6085***	5.002***	2.940***
		(0.155)	(0.184)	(0.201)	(0.139)	(0.182)	(1.275)	(0.764)
In default	0.0039							
	(0.0671)							
Debt/GDP	-0.0003		-0.0006	-0.00045	-0.0018***	-0.0002	-0.0015	-0.0011
	(0.0005)		(0.0006)	(0.0006)	(0.0007)	(0.0004)	(0.0021)	(0.0013)
GDP Growth	0.0557		0.0068	0.0699	0.0699	0.0404	0.343*	0.194*
	(0.0801)		(0.0058)	(0.0820)	(0.075)	(0.033)	(0.178)	(0.105)
Govt. Exp.	0.0126			0.0086	0.0236***	0.0236***	0.180***	0.101***
	(0.0074)			(0.006)	(0.008)	(0.007)	(0.0468)	(0.0252)
Polity IV	-0.0257			-0.0044	-0.0103	-0.0381***	-0.342***	-0.186***
	(0.0207)			(0.0277)	(0.0149)	(0.0142)	(0.117)	(0.0571)
GDPPC Gr.	-0.0580			-0.0630	-0.058	-0.0456	-0.368**	-0.206*
	(0.0838)			(0.0855)	(0.0745)	(0.0346)	(0.188)	(0.110)
Observations	307	209	175	172	238	172	162	162
R-squared	0.171	0.106	0.311	0.328	0.570	0.320		
Country FE	Y	Y	Y	Y	Y	N	N	N
Year FE	Y	Y	Y	Y	Y	Y	Y	Y

Dep. Var. [1] Dummy variable = 1 if incumbent leader is re-elected

Dep. Var. [2] Dummy variable = 1 if incumbent political party is re-elected

Robust standard errors in parentheses

**** p<0.01, ** p<0.05, * p<0.1*

mediately restructured the economy, including the public debt, and restored the economy to a more stable footing. He was re-elected five years later. The following is an extract from the IMF's 2001 Article IV consultation:

> *After experiencing steadily declining but positive rates of growth in the period 1996-98, the Surinamese economy contracted in 1999 and 2000. The performance of the economy in these two years was marked by falling activity levels and high inflation. In particular, real GDP excluding the informal sector is estimated to have fallen 8 percent in 2000. ...*
>
> *The stance of fiscal and monetary policies remained loose in the first seven months of 2000. In the run up to the May 2000 elections, the authorities granted large pay increases to civil servants, and central bank resources provided most of the financing for the fiscal deficit. After losing the elections, the outgoing government utilized the transition period to pay off large election-related expenses.*
>
> *Almost immediately after taking office in August, the new administration took action to address the economy's severe imbalances.*

2.5.3 Macedonia, 1992

The Former Yugoslav Republic of Macedonia (FYRM) declared independence from Socialist Federal Republic of Yugoslavia (SFRY) in September, 1991. Immediately, there were difficulties allocating external liabilities, especially as other constituent members of SFRY chose the same time to declare independence. An agreement on allocation was reached with SFRY, under the new president Kiro Gligorov, and renegotiation via Paris and London Clubs allowed them become eligible for IDA assistance and permitted them to restructure their long-term low-rate debt. Gligorov was re-elected in 1994. The following is an extract from the IMF's 1995 Staff Country Report No. 95/50:

> *All debt servicing payments were suspended at the time of monetary independence in April 1992, payments to the Fund were resumed in February 1993, current payments to the Fund were resumed in February 1993, current payments to the World Bank were resumed in October 1993 and arrears to the Bank were cleared in February 1994; all payments to official bilateral creditors and commercial banks have remained suspended.*
>
> *The breakup of the SFRY created significant difficulties in the allocation of external liabilities among the individual republics. The FYRM has accepted*

to assume the part of the debt of the former SFRY that can be allocated among the republics of the former SFRY according to the residency of the original borrower. The FYRM has also accepted, as a temporary solution until there is a permanent agreement on the division of assets and liabilities of the former SFRY, to assume 5.4 percent of the portion of the debt owed to official bilateral creditors that cannot be allocated according to the residency of the original borrower. Discussions have been initiated with the Paris Club Secretariat on an early normalization of relations with official bilateral creditors. Negotiations with commercial banks on the FYRM's share of the commercial debt of the former SFRY are still at an early stage.

The first thing to highlight from the previous anecdotes is a leader's inheritance of debt incurred by a predecessor. It is natural for a leader to take charge of a country's economic affairs and inherit the credit burdens of previous leaders. However, in most models of sovereign default the agent that contracts the debt, usually the central planner, is also the one that defaults. A richer political economy framework would allow different leaders to contract and default on debt and, in particular, for leaders to inherit a high debt burden.

Second, these anecdotes illustrate two different origins of high debt burdens. In Suriname, Wijdenbosch raised a large debt, but squandered the proceeds unproductively. This example serves as an illustration of circumstances where a large amount of debt is contracted in a period of time when there are insufficient productive projects available to generate returns sufficient to repay the debt. In Macedonia, by contrast, debt was contracted when assets were thought to be available to cover repayments and it was a change in external circumstances that led to a shortfall. This illustrates cases where productive projects are available to generate sufficient returns to repay debt but exogenous factors (these include natural disasters, as well as severe political change) mean the debt is burdensome to repay.

Third, and finally, these anecdotes serve as examples where a leader takes a decision to default and is re-elected. This goes against the postulated theory in the sovereign debt literature that argues political costs in the form of lost elections or power are motivation for leaders to repay sovereign debts. The model set out in the next section captures the features of sovereign debt and political economy highlighted by these anecdotes, and delivers results that correspond to those of the empirical section of the paper.

3 Modeling political career concerns about debt and default

3.1 Debt and default process

To combine sovereign default issues and political career concerns in one model necessarily requires gross simplifications of both. I first provide a stylised procedure for sovereign debt accumulation and default, and embed the process in a standard model of experts with career concerns to study the effect on politicians' decisions.

The first step is to define the normative level of debt that the economy ought to hold. To simplify the underlying processes that lead to particular levels of debt being normatively optimal, there will be only two levels of debt: $\infty > d_H > d_L > 0$, and I will parameterise the optimal level of debt by denoting it with $d_t^* \in \{d_L, d_H\}$. For the moment, d_t^* is given and, at the end of this section, I describe the process that gives rise to the specific value for d_t^*.

A natural question is why accumulating a relatively high level of debt is ever normatively desirable. There are many economic motives for accumulating debt, including growth opportunities, infrastructure investment and consumption smoothing. However, almost all reasons for debt accumulation have an associated risk that the country will be required to repay the debt from sources other than those in which the debt was invested, which may be too demanding in an economy with scarce resources. In some cases, the risk associated with high debt may optimally be accepted in exchange for faster recovery following a crisis, stronger growth, or speedier transition to a steady state. This leads to cases where it is sometimes optimal to have high debt, but it's not always clear when those times are.[14]

In addition to condensing the debt accumulation process, I simplify the normative state of default present in virtually all sovereign debt models, where states of the world exist in which it is utility-maximising, or welfare optimal, to default depending on the amount of debt owed to creditors. Simplifying this process to only two cases, let the state of the world be $a_t^* \in \{0, 1\}$ where $a_t^* = 0$ is the state where it is welfare optimal to default.

The probability a default is welfare optimal depends on the amount of debt previously contracted by the economy. First, $\lambda_L \in (0, 1)$ represents the probability that it is sometimes welfare optimal to default ($a_t^* = 0$) when the inherited debt level is high ($d_{t-1} = d_H$), even though debt should have been high from a socially optimal perspective ($d_{t-1}^* = d_H$).

[14] A developing economy may borrow and invest productively to accelerate growth, but the same borrowing may be squandered on white elephants or lost to corruption. This was noted at least as early as Fetter (1947), but has been more recently discussed in the context of Latin America, especially Brazil, (Cline, 1995, pp. 14-17) and the Heavily Indebted Poor Countries borrowing during the 1970's (Greene, 1989).

This is to capture the idea that sometimes shocks occur that render it socially optimal to default on debt that was previously optimal to hold - for example defaulting on the debt owed for building a road subsequently destroyed by an earthquake.[15]

Second, $\lambda_H \in (0,1)$ represents the probability that default is the socially optimal action when debt was actually high ($d_{t-1} = d_H$) but it was welfare optimal for it to be low ($d^*_{t-1} = d_L$). This captures the idea that, sometimes, it is optimal to default when a country has 'over-accumulated' debt.[16] It is assumed that the probability it is optimal to default when there is excess debt is greater than the probability it is optimal to default when debt is high and it was optimal to be so: $\lambda_H > \lambda_L$. More technically:

$$\begin{aligned} pr(a^*_t = 0 | d_{t-1} = d_L, d^*_{t-1} = d_H) &= pr(a^*_t = 1 | d_{t-1} = d_L, d^*_{t-1} = d_L) = 1 \\ pr(a^*_t = 0 | d_{t-1} = d_H, d^*_{t-1} = d_H) &= \lambda_L \in (0,1) \\ pr(a^*_t = 0 | d_{t-1} = d_H, d^*_{t-1} = d_L) &= \lambda_H \in (\lambda_L, 1) \end{aligned}$$

Finally, a process explaining the optimal level of debt d^*_t is required. Unlike the optimal default decision, which depends on the previous period's variables, the optimal level of debt is related to the current state of the world. In particular, I assume for tractability that if it is optimal to default in the current period, then it is always also optimal to have a low level of debt in that period.[17] In contrast, when it's not optimal to default in the current period there is an exogenous probability of $1/2$ that contracting high debt is the optimal action.

$$\begin{aligned} pr(d^*_t = d_H | a^*_t = 0) = 1 - pr(d^*_t = d_L | a^*_t = 0) &= 0 \\ pr(d^*_t = d_H | a^*_t = 1) = 1 - pr(d^*_t = d_L | a^*_t = 1) &= 1/2 \end{aligned}$$

3.2 Political Economy

Simplifying underlying economic processes permits a focus on the decisions of politicians, a technique commonly used in the literature studying experts with career concerns to

[15] In this light, default on debt that was previously optimal to hold may be viewed as a implicit contingency of incomplete sovereign debt contracts (Zame, 1993). The optimality of this action may or may not be observable to the creditors, but it needs to be so for the voters.

[16] Overaccumulation of debt is present in Perotti (1996) and Borensztein et al. (2005), and cross-country empirical evidence for overaccumulation may be found in Mendoza and Ostry (2008).

[17] Aside from tractability, it is not unreasonable for an agent that defaults to expect, albeit temporary, exclusion from capital markets - implying an imposition of low debt levels by creditors (Richmond and Dias, 2008; Sandleris et al., 2004). In anticipation of this exclusion, the decision maker should expect only to obtain low debt in the aftermath of a default decision and, if the decision itself were optimal, it makes sense that the low debt as part of that decision ought also to be optimal.

deal with the troublesome forward looking nature of these models.[18] In each period, the politician decides (1) whether or not to default and, (2) the level of debt to contract. Let the action of default be represented by $a_t \in \{0, 1\}$ where $a_t = 0$ is the action of default.

A politician receives exogenous fixed rents, $R > 0$, from office and seeks only to maximise the probability of re-election. To achieve this aim, they make decisions to maximise the welfare of voters, which is assumed to be a utility function with a bliss point at the optimal level of debt and default decision. As a specific functional form, welfare is assumed to be given by:

$$u_t \equiv -(a_t - a_t^*)^2 - \alpha(d_t - d_t^*)^2$$

Where α is the relative importance of obtaining an accurate decision on the level of debt over the accuracy of the decision to default. The functional form of utility is such that, once u_t is observed, all agents can determine $\{a_t^*, d_t^*\}$ which is important information for voters.[19]

3.2.1 Timing of game

Having observed $\{a_{t-1}, d_{t-1}, u_{t-1}\}$ all agents can infer d_{t-1}^* and, using the specified processes described above, determine the probability the economy is in a particular state. Politicians inherit the debt of the previous period and make a decision whether or not to default on it; if they do not default, repayment occurs. They then decide the amount of debt to contract. Finally, these decisions determine social welfare which is observed by all. These processes together constitute one period of time, and are represented in the diagram below:

Figure 1: Timing of information and decisions in the model

1	2	3	4
Wake up knowing (d_{t-1}, d_{t-1}^*)	Default decision: $a_t \in \{-1, 1\}$	Debt decision: $d_t \in \{d_H, d_L\}$	$\{a_t, d_t, u_t\}$ observed

In principle, elections may be held after any number of periods, however, an increase

[18] Typically in this literature, an expert is someone who knows the state of the world while an incompetent agent has some incentive to pretend to know the state of the world. Other examples of models of experts with career concerns include Holmström and Ricart i Costa (1986); Scharfstein and Stein (1990); Prendergast and Stole (1996) and Dasgupta and Prat (2006).

[19] The functional form also suggests that not defaulting when you should is just as socially bad as defaulting when you shouldn't. This is purely a simplification however, representing the ubiquitous feature in sovereign default models that adverse shocks to output, interest rates, terms of trade, etc induce states of the world in which it is optimal to default (Arellano, 2008; Guimaraes, 2011; Foley-Fisher, 2011).

in periods makes the computation of agents' strategies exponentially complex. For the purpose of this paper, I assume elections take place at the end of every period.

3.2.2 Politician's information structure

There are assumed to be two different types of politician, those that are *competent* and those that are *incompetent*. There is a large mass of politicians, of which a commonly known fraction μ are competent. A competent politician is assumed to know both their type and the welfare optimal actions regarding the debt and default decisions: $\{a_t^*, d_t^*\}$. An incompetent politician knows their type but does not know $\{a_t^*, d_t^*\}$. Incompetent politicians have the same information set as voters and everyone learns what the socially optimal choice would have been after a certain amount of time. The 'average' person does not know what the socially optimal choice is beforehand, but a number of expert politicians do have better ex-ante knowledge of the optimal choice. The information sets of both types may be summarised as follows:

Competent politicians know: $\Omega_c \equiv \{a_t^*, d_t^*, d_{t-1}, d_{t-1}^*, a_{t-1}^*, a_{t-1}\}$

Incompetent politicians know: $\Omega_n \equiv \{d_{t-1}, d_{t-1}^*, a_{t-1}^*, a_{t-1}\}$

Since politicians always know their type, the socially optimal solution is for them to admit (in)competence. Voters would then retain competent politicians and welfare would be maximised in every period: $u_t = 0 \; \forall \, t$. Assuming that politicians can only hold power for a fixed number of terms in office there would still be leadership turnover. The incompetent politician has an incentive to pretend that s/he is competent to obtain the fixed rents from being in power.

Voters randomly select a politician and observe the politician's actions and their own utility: $\{a_t, d_t, u_t\}$. The selected politician is given power for one period and receives exogenous fixed rents from being in power, which means it is optimal for her to maximise her probability of re-election. Voters want a competent politician in office and will only reelect one when their posterior belief that she is competent, given debt and default decisions, is higher than the probability that a random new politician drawn from the population is competent, i.e. their prior.

The competent politician is assumed always to choose correctly and, since they always know the correct choices, welfare under their leadership will always be zero, thereby always ensuring re-election since the posterior belief of competence, given correct actions, will always be greater than the prior.[20] Provided the incompetent politician is lucky enough

[20]There may be equilibria where the competent politician systematically chooses incorrectly, but I focus on *'non-perverse' equilibria* (Scharfstein and Stein, 1990).

to appear competent, s/he too will be re-elected.

Proposition 3.2.1 *Suppose $d_{t-1} = d_H$. There exists a perfect Bayesian equilibrium, when the probability that default is the optimal action is sufficiently small ($\lambda_J < 1/3$), where the incompetent politician never defaults, randomises over the choice of debt, and is re-elected with positive probability. A competent politician knows she is always correct and, because we are looking for a reasonable-strategy solution, will always take the correct action.*[21]

Proof

The equilibrium concept is perfect Bayesian equilibrium, where competent politicians choose welfare maximising strategies, incompetent politicians choose strategies to maximise the probability they will retain power, and voters form beliefs about the probability that the incumbent is competent and their beliefs are correct in equilibrium. The steps can be summarised as follows:

1. Derive voters' beliefs given strategies and observed outcomes:

$$(\hat{\mu}|a_t, d_t, u_t)$$

2. Compute expected payoffs for politicians of type j as a function of their strategies, given voters' beliefs:

$$\pi(a_t, d_t|\Omega_j) = \begin{cases} R \;\; if \;\; (\hat{\mu}|a_t, d_t, E[u_t]) > \mu \\ 0 \;\; otherwise \end{cases}$$

3. Determine politicians' optimal strategies, given different parameter values, and show voters' beliefs are consistent with these strategies

Observe that when $d^*_{t-1} = d_L$, the only parameter relevant to default is λ_H; whereas when $d^*_{t-1} = d_H$, the only parameter is λ_L. It is therefore convenient to let $\tilde{J} = H$ when $J = L$; and $\tilde{J} = L$ when $J = H$. Then define the time-invariant probabilities that the politician takes certain actions as follows:

$$\begin{aligned} q^{\tilde{J}} &\equiv pr(a_t = 1|d_{t-1} = d_H; d^*_{t-1} = d_{\tilde{J}}) \in [0, 1] \\ s &\equiv pr(d_t = d_H|a_t = 1) \in [0, 1] \end{aligned}$$

[21] For the purpose of this paper, the equilibrium of this Proposition is sufficient but, for completeness, Appendix C shows the existence of a perfect Bayesian equilibrium in a low debt environment, i.e. when $d_{t-1} = d_L$.

The first step in the solution is to derive voters' posterior subjective belief that the politician is competent. The voters update their prior belief that the politician is competent (μ) by observing the decisions taken and their own welfare, and employing Bayes' Rule. Denoting $\hat{\mu}$ as this posterior belief, we obtain:

$$\hat{\mu} = \begin{cases} \dfrac{(1/2)(1-\lambda_J)\mu}{(1/2)(1-\lambda_J)\mu + (1-\mu)q^{\tilde{J}}s(1/2)(1-\lambda_J)} & \text{if } a_t = 1;\ d_t = d_H;\ u_t = 0 \\ \dfrac{(1/2)(1-\lambda_J)\mu}{(1/2)(1-\lambda_J)\mu + (1-\mu)q^{\tilde{J}}(1-s)(1/2)(1-\lambda_J)} & \text{if } a_t = 1;\ d_t = d_L;\ u_t = 0 \\ \dfrac{\lambda_J\mu}{\lambda_J\mu + (1-\mu)(1-q^{\tilde{J}})\lambda_J} & \text{if } a_t = 0;\ d_t = d_L;\ u_t = 0 \\ 0 & \text{if } u_t \neq 0 \end{cases}$$

These posterior beliefs update the prior probabilities that the actions taken by the politician are the correct ones, thus accounting for the probability that the politician may indeed be competent.

Taking voters' beliefs as given, incompetent politicians can compute the payoff they expect to receive as a function of any strategy pair they may take, $\pi(a_t \in \{0, 1\};\ d_t \in \{d_H, d_L\})$, based on the probability that they may be correct and thereby be re-elected:

$$\begin{aligned} \pi(a_t = 1;\ d_t = d_H) &= \frac{1-\lambda_J}{2} R\mathbb{1}(\hat{\mu} > \mu) \\ \pi(a_t = 1;\ d_t = d_L) &= \frac{1-\lambda_J}{2} R\mathbb{1}(\hat{\mu} > \mu) \\ \pi(a_t = 0;\ d_t = d_L) &= \lambda_J R\mathbb{1}(\hat{\mu} > \mu) \end{aligned}$$

From these expected payoffs, and supposing $\hat{\mu} > \mu$ in all cases (verified below), an incompetent politician will never default if $\lambda_J < 1/3$, since the payoff from defaulting is expected to be lower than the payoff from not defaulting: $q^{\tilde{J}*} = 1$. In addition, since the payoffs to either level of debt are identical, the politician will pursue a mixed strategy[22]: $s^* \in (0, 1)$.

[22]The importance of the assumption that $pr(d_t^* = d_H | a_t^* = 1) = 1 - pr(d_t^* = d_L | a_t^* = 1) = 1/2$ becomes apparent here, but note that it is necessary only to induce the incompetent politician to randomise over actions in this simplified model. In a more complicated model the underlying intuition would still survive. For example, where the space of debt actions were a continuum, and the competent politician retained a perfect signal of the socially optimal debt level, the incompetent politician would want to randomise rather than always choose the same point based on some prior distribution. Similarly, if both types received informative, but imprecise, signals, then the strategic reaction would be for the incompetent politician to take actions in an effort to appear competent (Levy,

The final step is to show that $s^* \in (0,1)$ is consistent with voters' beliefs and their re-election strategies, given the actions of incompetent politicians:

$$\hat{\mu} = \begin{cases} \dfrac{\mu}{\mu + (1-\mu)s^*} & \text{if } a_t = 1;\ d_t = d_H;\ u_t = 0 \\ \dfrac{\mu}{\mu + (1-\mu)(1-s^*)} & \text{if } a_t = 1;\ d_t = d_L;\ u_t = 0 \\ 1 & \text{if } a_t = 0;\ d_t = d_L;\ u_t = 0 \end{cases}$$

which are all strictly greater than μ when $s^* \in (0,1)$ thereby verifying that this is an equilibrium.

■

3.3 Simulation

In order to demonstrate the intuition from the model, I suppose some values for the parameters and tabulate the results to compare to the empirical findings. For robustness, Appendix D reports results from several alternative parameterisations. To generate political turnover, suppose there are term limits of two periods. Although there are elections in every period, even a competent politician will be removed from office following their second period in power.

Table 6 below contains the parameter values used in the simulation. According to Proposition 3.2.1, any $s^* \in (0,1)$ is consistent with the perfect Bayesian equilibrium, however, the intuition from the model is most consistent with the data when incompetent politicians have a tendency to overaccumulate debt (this assumption is congruous with the anecdotes of Section 2.5).

Table 6: Parameter values for model simulation

Parameter	Value	Parameter	Value
λ_H	0.25	μ	0.6
λ_L	0.15	s^*	0.6

Table 7 summarises the history of actions and socially optimal actions when the model is simulated over 1,000 terms of office. The first row reports the number of times during the 1,000 terms when it was socially optimal to default; the second line reports the actual

2005).

number of default decisions that were taken, showing the calibration produces about one default for every twenty-five terms of office. The number of times when it was socially optimal to default is higher in first terms than in second terms because incompetent agents have a tendency to over-accumulate debt in the times when they are in power, which raises the probability that default is the socially optimal action in subsequent terms when they have lost power and a new incumbent is in place. The overaccumulation of debt is observable from the last two lines of the Table, the third line shows that in the new terms of politicians, there were 263 periods where it was socially optimal to take out high level of debt, but the fourth line shows that high debt was actually contracted in 291 periods. Comparing this to second terms in office, we see relatively less overaccumulation because there are fewer incompetent politicians in power for a second term.

Table 7: Default and debt decision simulation results

Variable	First term	Second term
Default states	40	24
Default decision	21	16
High debt states	263	206
High debt decision	291	225

Section 2.2 showed that when the number of defaults was scaled by the number of politicians in a particular quarter in office, the ratio was the same across electoral quarters. In an analogous calculation, Table 8 shows the history of Table 7 relative to the total number of political terms in office. Since there are incompetent politicians who are given power for a single term, but are not re-elected, there are more first term than second term politicians. When the number of actual defaults are scaled by the number of politicians, the relative frequency of defaults across terms in office are the same.[23]

Table 8: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.071	0.055
Default decision	0.037	0.037
High debt states	0.467	0.471
High debt decision	0.517	0.515

Section 2.4 showed some weak empirical evidence that the politicians who defaulted

[23]Of course, this model does not explicitly capture the number of politicians who leave during their terms of office but, from Table 3, it is evident how the end of electoral terms are the most important threshold for politicians to cross.

were also the ones more likely to be re-elected. The equilibrium of Proposition 3.2.1 shows that when there is a very low probability that actually defaulting is the socially optimal action to take, incompetent politicians will shy away from entering into default. By contrast, a competent politician will recognise the social benefit from defaulting and, by taking the decision at the right time, will be re-elected. Table 9 shows the intuition in the simulation of the model for this result. All the decisions to default are made by competent politicians who take the socially optimal decision and are subsequently re-elected.

Table 9: Simulation results relative to political terms by political competence

	Incompetent politician		Competent politician	
Variable	First term	Second term	First term	Second term
Default states	0.081	0.073	0.064	0.049
Default decision	0.000	0.000	0.064	0.049
High debt states	0.470	0.486	0.465	0.466
High debt decision	0.590	0.661	0.465	0.466

4 Concluding remarks

As noted by Panizza et al. (2009), although the theoretical importance of political economy considerations to sovereign default decisions has been postulated, comparatively little empirical work has been undertaken to verify or test alternative mechanisms. In part this is due to data limitations, both in cross-country political economy data and sovereign default data. This paper is no exception, and is challenged by these limitations to identify causal channels. Nevertheless, whatever small contributions can be made are valuable to understanding the broader canvas of sovereign default processes, especially in light of recent events in European sovereign debt markets.

The first two empirical findings presented in this paper are in contrast to game theoretic explanations for political decisions to default. In particular, the absence of evidence that sovereign defaults in good times are occurring early in political incumbency is contrary to theories where some types of government treat the decision to default differently.

The third finding, of a weak positive correlation between default and subsequent re-election, stands in contrast to intuition that political costs may explain why sovereign debt is ever repaid, and existing empirical evidence (Borensztein and Panizza, 2010). Of course the realisation of political costs may not be observed in equilibrium because they serve as an out-of-equilibrium threat point (Grossman and Van Huyck, 1988). The finding does suggest however that there may be another mechanism whereby those who actually do default are also more likely to be re-elected though, since the result is purely a correlation,

it emphatically does not suggest that those who default will improve their chances of re-election. And since it's not possible to identify causality empirically, I turn to model-based explanations.

The model I derive is based on an intuition that defaulting politicians reveal information on their competence and are therefore more likely to be re-elected by voters. Of course there may be alternative explanations for the empirical facts, for example, that a political leader does not default because it makes her a likeable member of the international community, and a good international reputation reflects well on the domestic economy. Then, when the domestic economy wants to default, the leader can utilise her international reputation to obtain a non-too-costly default, and domestic voters recognise the value of having a reputable leader with re-election. These alternative explanations show there is obvious scope for future work to derive contrarian empirical predictions from these alternative models, and empirically investigate their respective veracity.

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Year	Country	Type of Govt.	Election	Leadership	Q's of exp. term in office	Total Q's of leader in office	Month	Reason	Leader re-elected	Re-election possibility	Term limits
1975	Costa Rica	Presidential							0	No	4
1976	Costa Rica	Presidential							0	No	4
1977	Costa Rica	Presidential							0	No	4
1978	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1979	Costa Rica	Presidential							0	No	4
1980	Costa Rica	Presidential							0	No	4
1981	Costa Rica	Presidential							0	No	4
1982	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1983	Costa Rica	Presidential							0	No	4
1984	Costa Rica	Presidential							0	No	4
1985	Costa Rica	Presidential							0	No	4
1986	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1987	Costa Rica	Presidential							0	No	4
1988	Costa Rica	Presidential							0	No	4
1989	Costa Rica	Presidential							0	No	4
1990	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1991	Costa Rica	Presidential							0	No	4
1992	Costa Rica	Presidential							0	No	4
1993	Costa Rica	Presidential							0	No	4
1994	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1995	Costa Rica	Presidential							0	No	4
1996	Costa Rica	Presidential							0	No	4
1997	Costa Rica	Presidential							0	No	4
1998	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
1999	Costa Rica	Presidential							0	No	4
2000	Costa Rica	Presidential							0	No	4
2001	Costa Rica	Presidential							0	No	4
2002	Costa Rica	Presidential	1	1	4	4	May	Election	0	No	4
2003	Costa Rica	Presidential							0	No	4
2004	Costa Rica	Presidential							0	No	4
2005	Costa Rica	Presidential							0	No	4

B Table of defaults by country

Table 10: Table of defaults by country

Country	Year	Default-election quarter	Electoral history
Antigua and Barbuda	1996	Quarter 2	Election
Bolivia	1986	Quarter 1	Election
Cook Islands	1995	Quarter 1	Incumbent re-elected
Costa Rica	1981	Quarter 3	Election
Cote d'Ivoire	2000	Quarter 1	Election
Croatia	1992	Quarter 2	Incumbent re-elected
Dominica	2003	Quarter 4	Election
Dominican Rep.	2005	Quarter 1	Election
Ecuador	1999	Quarter 1	Election
Gambia	1986	Quarter 4	Incumbent re-elected
Grenada	2004	Quarter 1	Incumbent re-elected
Guatemala	1986	Quarter 1	Election
Guatemala	1989	Quarter 4	Election
Guyana	1979	Quarter 4	Incumbent re-elected
Indonesia	2002	Quarter 3	Election
Jamaica	1978	Quarter 1	Incumbent re-elected
Jamaica	1981	Quarter 1	Election
Jamaica	1987	Quarter 3	Incumbent re-elected
Kenya	2000	Quarter 3	Incumbent re-elected
Macedonia	1992	Quarter 1	Election
Mexico	1982	Quarter 4	Election
Moldova	1998	Quarter 1	Election
Moldova	2002	Quarter 2	Election
Nigeria	1982	Quarter 3	Election
Nigeria	2001	Quarter 3	Election
Nigeria	2004	Quarter 2	Incumbent re-elected
Pakistan	1998	Quarter 2	Election
Peru	1983	Quarter 3	Election
Senegal	1990	Quarter 2	Incumbent re-elected

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Table 10 – continued from previous page

Country	Year	Default-election quarter	Electoral history
Senegal	1992	Quarter 4	Incumbent re-elected
Serbia	1992	Quarter 1	Incumbent re-elected
Seychelles	2000	Quarter 3	Incumbent re-elected
Slovenia	1992	Quarter 2	Election
South Africa	1985	Quarter 1	Election
South Africa	1989	Quarter 4	Election
Suriname	2001	Quarter 2	Election
Trinidad and Tobago	1988	Quarter 2	Election
Ukraine	1998	Quarter 4	Election
Uruguay	1987	Quarter 2	Election
Uruguay	1990	Quarter 1	Election
Uruguay	2003	Quarter 3	Election
Venezuela	1983	Quarter 4	Election
Venezuela	1990	Quarter 2	Election
Venezuela	1995	Quarter 2	Election
Venezuela	2004	Quarter 3	Election
Zimbabwe	2000	Quarter 4	Incumbent re-elected

C Perfect Bayesian equilibrium in low debt environment

Proposition C.0.1 *Suppose $d_{t-1} = d_L$. There exists a perfect Bayesian equilibrium where the incompetent politician randomises over the choice of debt, never defaults, and is re-elected with positive probability. A competent politician knows she is always correct and, because we are looking for a reasonable-strategy solution, will always take the correct action.*

Using the same notation as in Section 3.2.1, the equilibrium is far simpler because, when $d_{t-1} = d_L$, there is no current state in which default is optimal. There is a single action a politician can take, and the time-invariant probability is denoted by:

$$s \equiv pr(d_t = d_H | a_t = 1) \in [0, 1]$$

The voters' posterior subjective belief, $\hat{\mu}$, that the politician is competent given the observed actions $\{a_t, d_t\}$ are derived using Bayes' Rule:

$$\hat{\mu} = \begin{cases} \dfrac{(1/2)\mu}{(1/2)\mu + (1-\mu)s(1/2)} & \text{if } a_t = 1 \text{ and } d_t = d_H \\ \\ \dfrac{(1/2)\mu}{(1/2)\mu + (1-\mu)(1-s)(1/2)} & \text{if } a_t = 1 \text{ and } d_t = d_L \end{cases}$$

Taking voters' beliefs as given, incompetent politicians can compute the payoff they can expect to receive, as a function of their strategy on debt, $\pi(a_t = 1;\ d_t \in \{d_H, d_L\})$, based on the probability that they may be correct and thereby be re-elected:

$$\begin{aligned} \pi(a_t = 1;\ d_t = d_H) &= \frac{1}{2} R \mathbb{1}(\hat{\mu} > \mu) \\ \pi(a_t = 1;\ d_t = d_L) &= \frac{1}{2} R \mathbb{1}(\hat{\mu} > \mu) \end{aligned}$$

Since the payoffs to either level of debt are identical, the politician will pursue a mixed strategy: $s^* \in (0, 1)$. Given these actions, the voters' posterior beliefs are:

$$\hat{\mu} = \begin{cases} \dfrac{\mu}{\mu + (1-\mu)s^*} & \text{if } a_t = 1 \text{ and } d_t = d_H \\ \\ \dfrac{\mu}{\mu + (1-\mu)(1-s^*)} & \text{if } a_t = 1 \text{ and } d_t = d_L \end{cases}$$

which are all strictly greater than μ for $s^* \in (0, 1)$, thereby verifying that this is an equilibrium.

■

D Alternative simulation parameterizations

D.1 $\lambda_h = 0.15$, $\lambda_l = 0.05$, $\mu = s^* = 0.6$

Table 11: Default and debt decision simulation results

Variable	First term	Second term
Default states	21	12
Default decision	15	8
High debt states	278	205
High debt decision	298	225

Table 12: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.038	0.027
Default decision	0.027	0.018
High debt states	0.497	0.465
High debt decision	0.533	0.510

D.2 $\lambda_h = 0.20$, $\lambda_l = 0.15$, $\mu = s^* = 0.6$

Table 13: Default and debt decision simulation results

Variable	First term	Second term
Default states	41	35
Default decision	20	29
High debt states	266	195
High debt decision	296	196

Table 14: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.072	0.081
Default decision	0.035	0.067
High debt states	0.469	0.450
High debt decision	0.522	0.453

D.3 $\lambda_h = 0.25,\ \lambda_l = 0.05,\ \mu = s^* = 0.6$

Table 15: Default and debt decision simulation results

Variable	First term	Second term
Default states	40	9
Default decision	23	6
High debt states	258	231
High debt decision	296	239

Table 16: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.072	0.020
Default decision	0.041	0.014
High debt states	0.463	0.521
High debt decision	0.531	0.540

D.4 $\lambda_h = 0.25,\ \lambda_l = 0.20,\ \mu = s^* = 0.6$

Table 17: Default and debt decision simulation results

Variable	First term	Second term
Default states	71	43
Default decision	38	33
High debt states	256	191
High debt decision	295	204

Table 18: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.126	0.099
Default decision	0.067	0.076
High debt states	0.454	0.438
High debt decision	0.523	0.468

D.5 $\lambda_h = 0.35$, $\lambda_l = 0.15$, $\mu = s^* = 0.6$

Table 19: Default and debt decision simulation results

Variable	First term	Second term
Default states	58	22
Default decision	33	16
High debt states	262	208
High debt decision	312	216

Table 20: Simulation results relative to political terms

Variable	First term	Second term
Default states	0.102	0.051
Default decision	0.058	0.037
High debt states	0.461	0.481
High debt decision	0.549	0.500

E Analysis using Arteta and Hale (2008) data

The tables in this Appendix repeat the analysis of Section 2 using the database generously provided by Carlos Arteta and Galina Hale. In this database, however, there is no recorded history of default episodes, so it is not possible to separate 'new' entries into default episodes. This means that the set of defaults are not fully comparable to those obtained from the Standard and Poor's database.

Table 21: Database descriptive statistics

		per country		per country
Number of countries	27			
Years of democracy	551	20.41		
Elections	138	5.11	Defaults	55 2.04
New incumbents	116	4.3		

Table 22: Timing of sovereign defaults over electoral cycles

	All Defaults		Parliamentary Defaults		Presidential Defaults	
	first term	re-elected	first term	re-elected	first term	re-elected
Q1	19 (0.17)	1 (0.05)	3 (0.11)	1 (0.11)	16 (0.19)	0 (0.00)
Q2	11 (0.10)	0 (0.00)	3 (0.13)	0 (0.00)	8 (0.10)	0 (0.00)
Q3	5 (0.05)	3 (0.16)	1 (0.05)	2 (0.22)	4 (0.05)	1 (0.10)
Q4	10 (0.11)	6 (0.35)	1 (0.07)	1 (0.14)	9 (0.12)	5 (0.50)

Q corresponds to an expected quarter of a term in office

Figures in parentheses are % of respective population

Table 23: Timing of defaults over leaders' electoral lives

	All Defaults	Parliamentary Defaults	Presidential Defaults
Q1	18 (0.17)	2 (0.07)	16 (0.20)
Q2	12 (0.12)	5 (0.21)	7 (0.09)
Q3	5 (0.05)	1 (0.05)	4 (0.06)
Q4	12 (0.14)	1 (0.06)	11 (0.16)
Q5	0 (0.00)	0 (0.00)	0 (0.00)
Q6	1 (0.06)	1 (0.20)	0 (0.00)
Q7	2 (0.14)	1 (0.20)	1 (0.10)
Q8	1 (0.08)	0 (0.00)	1 (0.10)
Q9	0 (0.00)	0 (0.00)	0 (0.00)

Q corresponds to an expected quarter of a term in office

Figures in parentheses are % of respective population

Table 24: Timing of defaults in good and bad times

	GDP Growth (6.25)		Debt-export ratio		Debt-GDP ratio		Reserve-debt ratio	
	Good times (above trend)	Bad times (below trend)	Good times (below 20%)	Bad times (above 20%)	Good times (below 200%)	Bad times (above 200%)	Good times (above 10%)	Bad times (below 10%)
Q1	8	12	6	11	4	13	8	8
Q2	4	7	2	9	1	10	6	5
Q3	3	5	1	5	1	5	1	6
Q4	10	6	5	10	6	9	8	7
Total (share)	25 (0.45)	30 (0.55)	14 (0.29)	35 (0.71)	12 (0.25)	37 (0.75)	23 (0.47)	26 (0.53)

Q corresponds to an expected quarter of a term in office