

Essays on the Political Economy of Public Finance:
Taxation and Debt

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Declaration

I certify that the thesis I have presented for examination for the MPhil/PhD degree of the London School of Economics and Political Science is solely my own work. The copyright of this thesis rests with the author. Quotation from it is permitted, provided that full acknowledgement is made. This thesis may not be reproduced without the prior written consent of the author. I warrant that this authorization does not, to the best of my belief, infringe the rights of any third party.

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Abstract

The granting of discretionary budgeting powers to policymakers whose utility functions do not match those of the societies they govern, may lead to sub-optimal fiscal outcomes which require the creation of binding and credible commitments to rectify. Past research into the institutional constraints placed upon, and behaviour of, policymakers has shown that these do, in fact, generate real effects on macroeconomic performance. Optimal fiscal systems, in this sense, become reliant on having in place an institutional framework which structurally induces social welfare maximizing outcomes.

This thesis provides both a historical overview of the birth of modern public finance as well as an in depth examination of both theoretical and empirical contributions to tax theory with a full statistical analysis of the multidimensional determinants of compositional systems of budget equations from the revenue side, observed across 90 states between 1990-2008. There is also the somewhat neglected area of finite planning horizons in public finance, where policymaker discount factors may lead to sub-optimal dynamic fiscal outcomes; mainly, the accumulation of public debt. Theoretical expectations have been difficult to statistically validate due to unobservable transition likelihoods and endogeneity problems which are overcome in this paper revealing significant discount effects on the accumulation of debt. Lastly, the recent popularity of budget rules in many of the world's economies has led to questions regarding their effectiveness where profligate governments may be less likely to adopt budget rules that constrain their budgeting powers. Empirical findings suggest that rule adoption is partially determined within the equation of fiscal performance, making it difficult to identify the 'true' effects of budget rule adoption, as well as whether these are of first or second order.

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Part I

The Birth of Modern Public Finance

1 Introduction

Unprecedented transformations in the economic and political landscape over the past one-hundred and fifty year period has fostered the birth of a new era of public finance. Two central themes of this fiscal transition were *i*) a compositional shift towards direct taxation, which “formed the last step in the historical development of public revenue” ¹, and, *ii*) a widespread adoption of Keynesian macroeconomic ideology, which rationalized the use of discretionary deficit spending in years of peace. Within the first theme, a compositional shift towards the use of (historically despised and difficult to administer) direct taxation was the primary supply side driver behind the financing of an era of unprecedentedly large 21st century central governments. This shift is not only interesting as a large contributor to the growth of government, but also a philosophical shift from a regressive tax system to a progressive one where redistribution of income took on a much greater role. These compositional changes in tax systems are attributable to four interconnected factors which continue to shape systems of public finance as we know them today. While the exogenous shock of war necessitated the creation of new revenue bases, these new taxes could not have been profitable without the growth and mass mobilization of economic resources which occurred in the late nineteenth and early twentieth century. Advancements in, and the centralization of, administrative technology also allowed governments to feasibly access revenues from tax bases which were previously too costly to collect. Lastly, the political reforms that took place over the course of the late 19th and early 20th century put in place the necessary institutional apparatus to gain tax compliance from the masses who, in turn, received the ability to influence the formation of the fiscal policy that has come to shape the modern welfare state.

Within the second theme, the debate between Ricardian-Equivalence, Neoclassical and Keynesian macroeconomic perspectives on debt has had strong implications for theories of optimal fiscal dynamics and debt sustainability since the birth of modern public finance which has re-

¹(Seligman 1921)

cently become a subject of significant interest where advanced economies have been projected to reach public debt levels of 110% as a percentage of GDP by 2014.² Be it for reasons of smoothing economic cycles or reviving a stagnating economy, the accumulation of peacetime debt has become an acceptable norm in the majority of 21st century advanced economies. This widespread macroeconomic ideological shift from balanced budget principles to that of Keynesian budget manipulations has allowed policymakers to make discretionary fiscal decisions about the allocation of current, as well as future, financial burdens where the associated costs may be heavily discounted by finite horizon actors.

Generally speaking, the granting of discretionary budgeting powers to policymakers whose utility functions do not match those of the societies they govern, may lead to sub-optimal fiscal outcomes which require the creation of binding and credible commitments from policymakers to rectify. Within both themes, the institutional constraints place upon, and behaviour of, policymakers have been shown to generate real effects on macroeconomic performance. Optimal fiscal systems, in this sense, become reliant on having in place an institutional framework which structurally induces social welfare maximizing outcomes. It is these two themes that form the centerpiece of this thesis.

This introduction will provide a historical overview of the birth of modern public finance with some evidence from the adoption of income tax in western European economies. The purpose of this section is to highlight the role of the four major factors which contributed to the evolution of modern systems of public finance with an emphasis on the birth of the income tax in France and the United Kingdom. Section 2 moves from a historical descriptive, to modern systematic context, providing an overview of both theoretical and empirical contributions regarding the mechanisms behind the evolution of tax theory along with a formal statistical analysis of the multidimensional determinants of systems of budget equations from the revenue side which were discussed in Section 1, observed across 90 states between 1990-2008. Section 3 examines the somewhat neglected area of finite planning horizons in public finance, where policymaker discount factors may lead to sub-optimal dynamic fiscal outcomes; mainly, the accumulation of public debt. Section 4 tests for budget rule endogeneity using an event history analysis approach with empirical findings suggesting that rule adoption is partially determined within the equation of fiscal performance, which makes it difficult to identify the 'true' effects of budget rule adoption, as well as whether it is of first or second order.

²see IMF World Economic Outlook 2011.

2 Systems of Public Finance: A Historical Overview

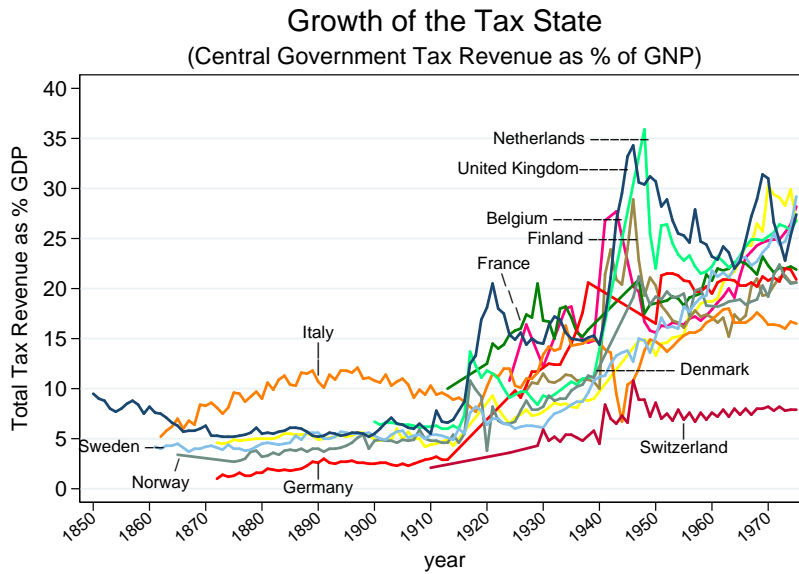
While modern economic theory assumes the existence of efficient institutions which sustain markets and tax citizens, “such a starting point cannot be taken for granted in many states in history or the developing world of today” (Besley and Perrson 2007). As late as the end of the 19th century, systems of public finance were described as: “... not really systems at all”; but were instead, “a collection of disparate excise charges, duties, and taxes on an amazing array of items and services – everything from men’s hair powder to windows to salted cod”, and, were seen as “highly inefficient, easy to avoid, inequitably applied, and did not generate much revenue” (Steinmo 2003). These governments had inefficient, decentralized and corrupt systems of tax administration and were not able to tap into lucrative revenues from historically despised direct taxes. While these small and inefficient central governments were sustainable with revenue requirements averaging five percent of Gross National Product, faced with the exogenous shock of mass warfare, the state took on a much larger centralized macroeconomic role (see Figure 1). Increased revenue requirements brought on by the First World War laid the seeds for new tax bases which would come to take on a new, and unanticipated, role in financing a large proportion of the modern welfare state.

Prior to the First World War, total tax revenues, as a percentage of GNP, across a sample of eight western European states averaged 5.63 percent with the majority (78.3%, on average) of this revenue coming from indirect sources (customs and excise). Figure 1 shows the growth of tax revenues over the 1850-1970 period for a sample of 11 western European economies.³

³Countries with pre-WWI total tax to GNP data: Denmark, France, Germany, Italy, Netherlands, Norway, Sweden, United Kingdom.

Source: Flora et al. 1983.

Figure 1: Growth of the Tax State (1850-1970)



Revenue requirements of the First World War led to the introduction of new tax instruments and large post-war central governments to the extent that, by 1920, the tax to GNP ratio had almost doubled in order to repay war debt, averaging 11.05 percent between 1919 and 1921.⁴

At the forefront of this growth was the defining tax of this period, individual income tax; the confiscatory nature of which was historically seen as “acceptable only in emergencies, when receipts from all other revenue sources failed to cover rising current expenses and costs of past debt” (Webber and Wildavsky 1986). In fact, at the end of the 19th century, in a country that would come to collect the largest proportion of their revenues in the form of income tax (USA), was described as:

“A tax so odious that no administration ever dared impose it except in times of war; and you will find that people *will not* tolerate it in times of peace. It is unutterably distasteful both in its moral and material aspects. It does not belong to a free country [and] will corrupt the people”

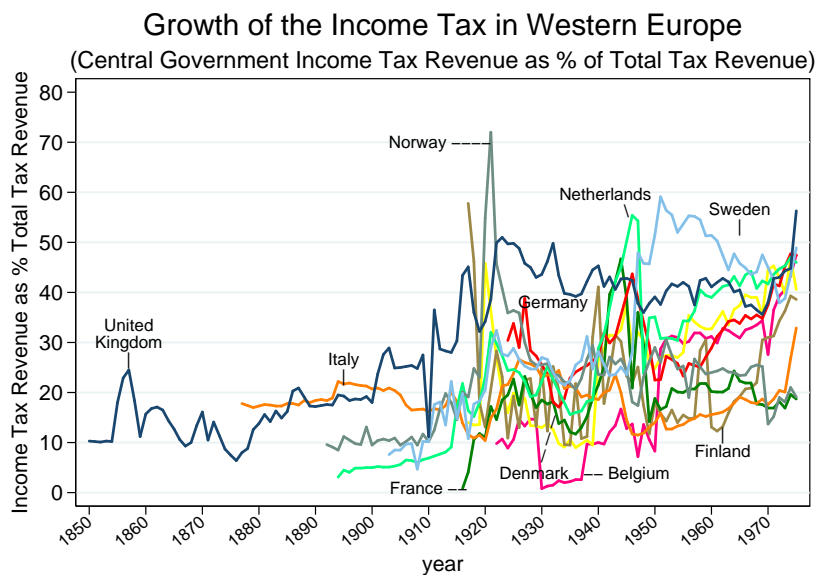
-Adams (Pennsylvania) 1894 -⁵

⁴Based on the same sample of countries as mentioned above.
Source: Flora et al. 1983.

⁵Adams of Pennsylvania in 1894 - emphasis added by author

Post war tax inertia, or the 'ratchet effect' of war,⁶ continued throughout the 20th century without any peacetime abolition of the income tax. Total tax revenues grew again to an average 12.1% of GNP in the 1930s. This figure jumped dramatically by almost 5 percentage points to 16.9% in the forties which was mainly the product of an income tax base expansion in order to meet extreme financing requirements of the Second World War. Prior to this, these taxes were paid only by the top end of the income distribution, whereas by the end of the war at least sixty percent of income earners were now paying income tax in western European states (Steinmo 2003). Contrary to the initial principles of the income tax, it's existence in years of peace contributed a large proportion of post war growth in the size of central governments averaging 17.9% and 19.9% in the 50s and 60s, respectively. Although initially intended solely to finance war, the combination of economic growth, administrative advancements and political bargaining led to peacetime sustainability of the income tax that was historically thought to be impossible in any advanced economy. In a post World War II setting, progressive taxes unintentionally became a permanent and fundamental feature of public finance systems, as well as a method of redistributing income, in modern advanced economies.

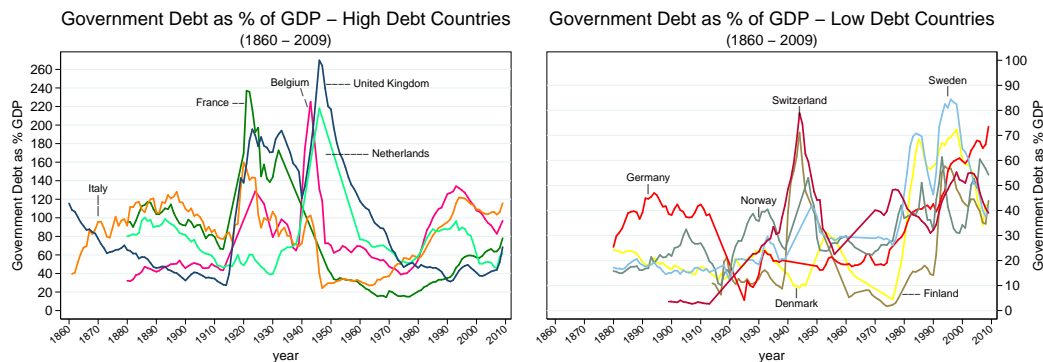
Figure 2: Income Tax Revenues (1850-1975)



⁶see Kiser, E. and Linton, A. 2001.

An alternative instrument in the fiscal toolbox, which was historically reserved for war, was the accumulation of sovereign debt. The growth in tax revenues throughout the 20th century in all western European states seen in Figure 1 did not prevent them from running large deficits. Heavy costs incurred during the First and Second World War forced western European governments to expand the current flow of revenues by running extremely high deficits during war years (see Figure 3). In the post war era came a new macroeconomic perspective towards the accumulation of debt which justified the use of deficit financing as a measure to revive stagnating economies in western Europe, allowing them to pay back any debt with newly created wealth. Prior to Keynes and the multiplier, peace-time deficits were seen as both theoretically, as well as socially, undesirable. They were regarded as distortionary to growth through crowding out effects in the private market, and, in a best case scenarios, were regarded as economically neutral. Along with a moral emphasis on balanced budgets principles in the 19th century, governments were extremely averse to the accumulation of peacetime debt, which meant that any increases in expenditures required an equal increase in revenues (Webber and Wildavsky 1986 chpt. 8; Daunton 2002). In countries such as Germany, this principle remained constitutionally enshrined until the 1960s, keeping their levels of debt at relatively modest levels (see Figure 3). The shift to more flexible fiscal policy, instigated by Keynes, was as much attributable to a mass ideological shift as it was to a small community of economists and policymakers. It was a movement from relatively anti-government society to one that trusted policymakers to work beyond the confines of current revenues in order to revive a stagnating economy by making people feel richer than they were.

Figure 3: Government Debt in Western Europe (1860 - 2009)



2.1 Public Finance in the United Kingdom

Britain provides one of the best windows into the past when it comes to the modernization of tax policy. A successful early passing of what would become “the most important tax invention

in the modern world” (Adams 1993), was partly a function of a durable and pragmatic state which, since the Glorious Revolution, constitutionally divided budgeting powers between the Crown, the House of Commons and the Lords (Coffield 1970; North and Weingast 1989). As the world’s richest economy with persistent economic growth, this produced a feasible landscape for the incremental introduction of a modern income tax over seventy years before other western European countries (see Aidt and Jensen 2009). While other states struggled to secure the political and administrative infrastructure required for the successful implementation of this lucrative tax in the midst of the First World War (to a great extent modeled by the British system), the British had already gained a firm administrative grounding on this historically unpopular progressive tax base, creating a fiscal comparative advantage for financing war efforts with current taxes.

After its initial “heroic”⁷ creation in 1799 as a tool to finance the war with France (dubbed ‘the tax that beat Napoleon’),⁸ William Pitt could not have conceived that the much hated income tax originally attached to his assessments for the sole purpose of financing war (rather than the redistribution of income - see quote below -) would be replicated by the majority of the worlds states within one hundred years:

“How much safer is it to submit to those inequalities which are the lot of man, and which is not the business nor is it in the power, of schemes of finance to correct! Let us then forbear to attempt what is perhaps beyond the power of human legislation to correct.”

- William Pitt 1798 -⁹

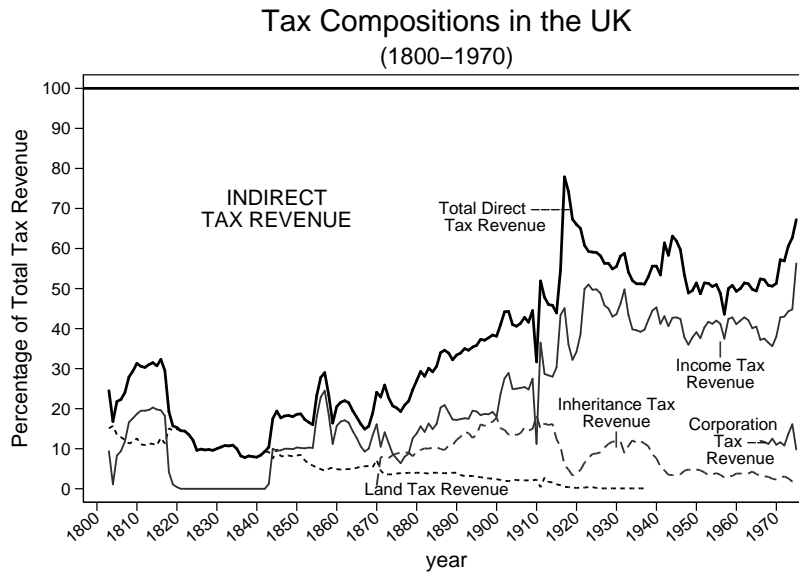
Mass unpopularity of the income tax at the end of the Napoleonic Wars which, even at low progressive rates of 0.8% at the bottom to a top rate of 10%, created a threat of revolt from the disenfranchised population. Intrusive direct taxation left taxpayers feeling alienated and the legitimacy of the British state threatened, leading the government to abolish the 1799 income tax eleven days after the signing of the Treaty of Amiens with the French in 1802. A new war with France in 1803 led to the introduction of Henry Addington’s reformed income tax which revolutionized British tax technology with the invention of modern administrative measures such as tax schedules as well as stoppage at the source. These administrative measures *doubled* the efficiency of the income tax, allowing for a statutory rate reduction of five percentage points. Even with these new measures, the income tax remained exclusively reserved for wartime which, even then, was barely tolerated. It was repealed again in 1816 at the end of the Napoleonic Wars with the order that all documents relating to this tax were “to be cut into small pieces and

⁷Hamilton, 1947 p.128

⁸Adams, C. (1993) For Good and Evil.: The Impact of Taxes on the Course of Civilization, 1999.

⁹HANSARD’s 34 Parliamentary Debate 3rd series, col. 8 1798 (taken from Grossfeld and Bryce 1983)

Figure 4: Tax Compositions in the United Kingdom (1800-1975)



conveyed to a paper manufacturer, so that no trace of the hated tax would remain.”¹⁰ As can be seen in Figure 4, the almost 20 percent of total tax revenue generated by this lucrative base in 1816 was replaced by the more regressive indirect taxes (customs and excise), which increased by 13 percentage points (as a percentage of total tax revenue) by 1818, with the remainder being made up by land tax revenues.¹¹

Progressive income taxes resurfaced again in 1842 when Robert Peel introduced them as a temporary three year measure to finance a large deficit in the presence of falling revenues from indirect sources, as well as to promote the Conservative government’s free trade policies by reducing the production costs of firms (see Figure 4 and Figure 7). Even with initial low rates imposed on a narrow base of income earners, public distrust of a peacetime income tax made it difficult for government to justify. Consecutive British government’s vowed to abolish the ‘temporary’ tax in order to avoid taxpayer revolt, as was the case in 1802 and 1816; however, income tax revenues had become a lucrative necessity for the Treasury leading them to, instead, engage in fiscal exchange or tax bargaining with the taxpaying public.

At the same time that direct taxes were being pushed to new limits, the British political

¹⁰Daunton 2002

¹¹Source: Flora et al. 1983.

landscape was being transformed with the extension of the franchise, effectively incorporating the masses into the policymaking process. Ten years prior to the introduction of the 1842 income tax, the new Whig government twice passed electoral reform bills through the House of Commons only to be defeated in the House of Lords, leading to the resignation (and eventual re-appointment) of Earl Grey (2nd). Upon his return, the Tories, who could not maintain support in parliament, abstained from voting on The Reform Act which allowed it to finally pass in 1832. Under this Act, voting rights were extended to adult males who rented propertied land of a given value, effectively increasing the male electorate from 3.8% of the total over twenty year old population in 1831 to 5.9% in 1833.¹² The franchise was extended again in 1867 with support from a Conservative government concerned that any opposition to franchise extension may be seen as anti-reform. The subsequent Reform Act of 1867 gave the vote to all male householders and lead to an increase in male suffrage from 8.3% of the over twenty population in 1868 to 14.5% in 1869.¹³ The Liberal government in 1884 negotiated with a majority Conservative House of Lords to allow the passing of the Representation of the People Act, which amended the Reform Act of 1867, extending the franchise to countryside voters. By 1885, almost thirty percent (29.3%) of over twenty British males voted in the General election, up from 16.5% in 1883 (see Figure 5). With almost thirty percent of the population enfranchised, the political incorporation of interest groups into British policymaking was inevitable. Pragmatic incorporation of these groups into the policymaking process led to a grudging compliance with the historically despised income tax, where civil collectives could bargain with government through “small scale adjustments designed to meet political and financial exigencies” (Daunton 2002). This incremental and dynamic bargaining process would come to characterize the relative success of the British tax system it its ability to .

Figure 5: Extension of the Franchise and Tax Revenue in the United Kingdom



¹²Data from Flora et al.

¹³*Ibid*

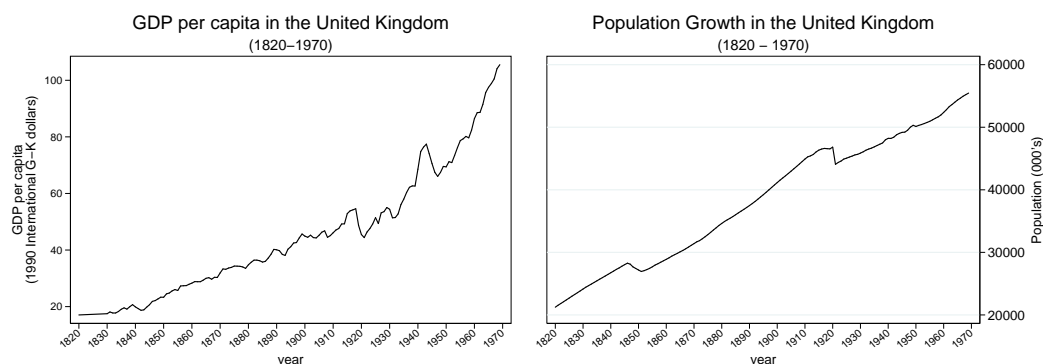
Income tax revenues initially came from small bases and were therefore quite low, fluctuating around 10 percent of total tax revenue in the early second half of the 19th century while the the United Kingdom was being transformed demographically, economically and politically. Its steady growth in the latter half of the century led to a doubling of central government reliance on this base to finance 20 percent of total tax revenues before 1914. At the outbreak of the First World War, the British had a modern tax system in place which gave them the ability to collect relatively larger shares of war taxes than other European nations (see Figure 1). The financial necessities of war led to large increases in tax progressivity, as well as a base expansion, of those liable to pay income tax. The war budget of November 1914 increased income tax rates by one-third, which was again doubled in 1915-1916 accompanied by a lowering of the exemption rate from £160 to £130 (Daunton 2002). Income tax revenues became an extremely important source of war finance in Britain, increasing from 28% of total tax revenue in 1914 to 43.4% in 1916.¹⁴ By 1917 this tax base became fundamental to the operation of the British state, generating about 45% of total tax revenue (see Figure 4).

Since the mid 1800s, the United Kingdom was also experiencing persistent economic and population growth, giving the taxpaying population higher levels of disposable income, and the government larger bases to tax. Thanks to the Industrial Revolution, the UK was the most prosperous and stable economy in the world when a permanent income tax was first introduced in 1842 with per capita GDP increasing an additional 136% before the outbreak of the First World War.¹⁵ Steady population growth and urbanization in the newly industrialized economy also provided a vast supply of labour, yet working class populations still spent more than two-thirds of household income for food (Webber and Wildavsky 1986). Despite this highly skewed income distribution and the early introduction of suffrage as well as progressive income tax, the pre-war tax system remained predominantly regressive. Prior to the First World war, R.H. Tawney's research foundation at the London School of Economics and Political Science found that a family with a weekly income of 18s paid 2.8% of its income in food taxes and 7.1% in food, alcohol and tobacco taxes; contrasted by a family with £2 a week who paid 1.3% and 3.2%, respectively (Daunton 2002). Increasing populations with increasing levels of disposable income and political strength led to a new *raison d'être* for a progressive income tax; a promotion of equality through geometrically progressive direct taxes.

¹⁴*Ibid*

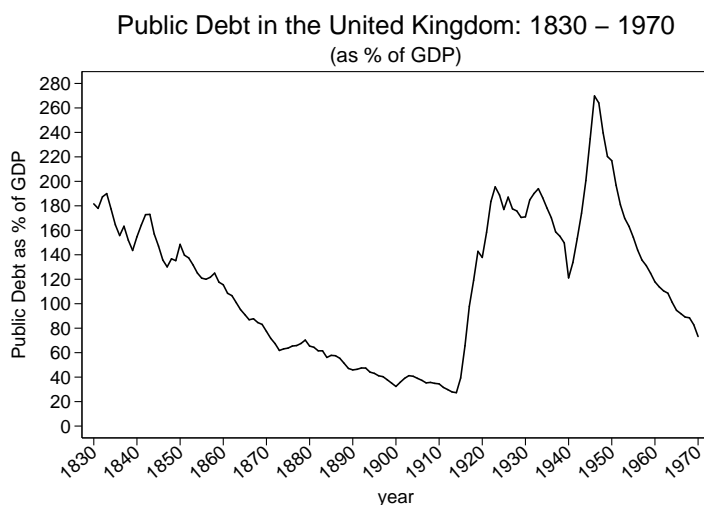
¹⁵Data from Maddison,A. 1995.

Figure 6: Economic and Population Growth in the United Kingdom (1820-1970)



Persistent economic growth, along with extensive use of direct taxation, however, did not prevent Britain from relying, to a great extent on debt financing the First and Second World War. The use of the income tax initially helped them defeat the French while keeping the unpopular accumulation of debt at historically modest levels, growing from £415 million prior to the Napoleonic War in 1798 to just over £860 million in the early 1800s. By the mid 19th century, debt from the Napoleonic war had modestly grown to £853 million but, with the help of the 1842 income tax, fell again to £650 million by 1914. Because of this, confidence in the security of government loans kept interest rates low and borrowers happy. At the outbreak of First World War, Chancellor of the Exchequer, Reginald McKenna’s fiscal policy mistakenly moved to a “new principle of war finance... the concept of the ‘normal year’”: a form of ‘military Keynesianism’ which departed from the forever lost wisdom of Gladstonian fiscal orthodoxy “that expenditures should as far as possible be met out of taxes” (Daunton 2002). By the end of the First World War, public debt had grown from £650 million to over £7,000 million, with borrowing making up over 70% of government net income receipts (see Figure 6). The Second World War created further increases in public debt in the United Kingdom leading to a question which resonates with modern 21st century advanced economies of “... whether artificially low interest rates imposed by the heavy burden of debt may not seriously interfere with future efforts to curb monetary inflation and to combat dangerous cyclical expansion” (Hamilton 1947).

Figure 7: Public Debt in the United Kingdom (1830-1970)



The First World War left Britain with large amounts of debt accompanied by a heavily burdensome tax system, making these central issues of post war politics. The proportion of people paying income tax in Britain at the end of the First World War was higher than ever before with unprecedented statutory rates and base sizes generating over fifty percent of total tax revenue (see Figure 4). Although debt was falling and disposable income was on the rise in Britain, both points had inevitable consequences for tax compliance, requiring the British government to adapt to political demands of a heterogenous population of taxpayers, and the taxpayers to adapt to the financial demands of the state. The official number of income taxpayers in the United Kingdom rose by over 280% (from 3,800,000 to 14,500,000) between 1938-39 and 1948-49.¹⁶ Trust in the fiscal constitution became increasingly important with the passing of the Representation of the People Act in 1918 which lifted property restrictions for men, who could vote at 21. Women were also given the vote under a property and age restriction (over 30 years old). This led to a steep rise in turnout for the general election of 1918 (74.8% of the British population over twenty voted); an increase of 46 percentage points since the previous election in the second half of 1910 (see Figure 3). The success of the British government in retaining what was a relatively burdensome tax system was further sustained by the work of the Royal Commission on the Income Tax (1919-1920) whose primary objective was to reassert the income tax as apolitical and fair across all classes and interests.

¹⁶United Kingdom Office of National Statistics. Table T1.4 - Numbers of taxpayers and registered traders. Updated April 2010

In a post-war setting, direct taxes were pushed to new extremes, taking on an unintended political role as a tool for social justice and political pragmatism in the unprecedentedly large modern welfare state that has come to exist in a majority of 21st century advanced economies. A new standard of redistribution emerged, transforming the regressive pre-war tax system into a progressive tool to rectify ‘social injustices’ of the private market. Table 1 shows the extent of this transformation in 1925 where the regressive tax system found by Tawney was transformed through the use of direct taxes. By 2008, general government total revenues had grown to make up around 42.5% of GDP with income tax making up 27.7% of total revenue with a top statutory rate of 40%.¹⁷

¹⁷Source: IMF Government Finance Statistic, IMF International Finance Statistics and World Bank World Development Indicators

Table 1: Regressivity/Progressivity of British Tax System (1925-1926)

Income (1925-26) £	% of Income Taken by Taxation Where Income is Wholly Earned		
	Direct Taxation	Indirect Taxation	Total
100		11.9	11.9
150		11.6	11.6
200		10.2	10.2
500	2.0	4.2	6.2
1,000	8.1	2.9	11.0
2,000	13.2	2.0	15.2
5,000	21.9	1.3	23.2
10,000	30.0	1.2	31.2
20,000	36.9	0.6	37.5
50,000	44.2	0.2	44.4

2.2 Public Finance in France

The political and fiscal structures of 19th and 20th century France were far different from that in Britain. From the late middle ages, French governments approached finance with *ad-hoc* taxes and improvised methods of borrowing to satisfy the unconstrained spending of politicians. The First revolution allowed parliament to take tax control away from the nobility, clergy, provinces, and cities, yet the tradition of *ad-hoc* taxes continued with the inexperienced post revolutionary National Assembly. The government's approach to progressive taxation was best characterized as "not opposed to the principle of income taxation but only to the method in vogue", while "remaining conservative in matters of taxation" (Willis 1895). Fiscal indiscipline in France was amplified by the rules for budgeting themselves, which reflects the well known common pool resource problem, or 'Law of $1/N$ ':

"According to the rules for budgeting that France adopted during the nineteenth century, its parliament, rather than Finance Ministry maintained control over the budget. The minister of finance presented budget proposals to the Chamber of Deputies, which reserved the right to initiate money bills and propose increases in the original estimates. Such an arrangement encouraged legislators to expand spending by horse trading; and, in the process, to weaken what in those days was called the equilibrium of the budget. Long before the war began, revenue normally lagged behind expenditures, because, given the multiplicity of parties, no political leader was strong enough to assume the risk of proposing higher taxes. . . According to a wartime Minister of Finance, in such circumstances, "one is led to think that there are no limits and that one may spend without reckoning." ¹⁸

While the First Republic remained conservative in matters of taxation, there were numerous attempts at a modern income tax during the Second and Third Republic. The revolutionary government of the Second Republic mandated a radical approach to both political and fiscal policy which would provoke hostilities that came to prevent the passing of a modern income tax bill which was to be a thorn in the side of French governments for the next sixty years. These were based on a French hatred for any intrusion on private liberties (which were directly correlated with direct taxation), as well as the introduction of radical, rather than incremental, tax bills in an ideologically fragmented legislature.

¹⁸Willis, P.H. 1895. Income Taxation in France. *The Journal of Political Economy* 4 (1)

The first attempt to introduce a modern income tax on March 16th 1848 proposed in a “burst of revolutionary fervour”¹⁹ to tax all income at *one-third* was soundly rejected in parliament by 691 votes. Proposals for radical geometrically progressive taxation was not a new idea in France²⁰, yet an exaggerated income tax bill created a bad reputation from its first attempt in parliament. On March 20th 1850, then Finance Minister Hippolyte Passy, drew up another income tax proposal which, given overwhelming opposition, led to the dropping of the bill before it even reached parliament. Passy warned the French Parliament: “You will sooner or later, be compelled to do in France as has been done in Britain” (Chailley 1887). Although this prediction would prove to hold true, an income tax bill would not pass through the Chamber of Deputies for another sixty-four years.

The Second Republic, with “longing looks directed towards the English Budget”, which, through the income tax, saw a “supposed harmony between this mode of taxation and democratic ideas made it a peculiarly attractive project” (Willis 1895). The franchise was immediately extended to all adult males in a single 1848 declaration. Between 1846 and 1848, voter turnout increased from 1.1% (of the over twenty year old population) to 36.3% (see Figure 8). With over 9 million newly enfranchised voters, the excitement on the streets of Paris was said to be “like a river which suddenly breaks through its dikes, imprudently weakened by the riparian dwellers.”²¹ Extension of the franchise, however, would not be sufficient to create an atmosphere of trust in an unaccountable and unstable executive where off budget accounts and supplemental appropriations were an easy way to avoid transparency and budgetary accountability (Webber and Wildavsky 1986). The coup of December 2, 1851 brought with it a new constitution giving executive power to the President who was given the power of legislative initiative for a ten year period. This took both power and credibility away from a legislature who would soon become quite powerless. By referendum in 1852, the Second Republic transformed into the Second Empire and Louis-Napoleon Bonaparte officially became Napoleon III, elected Emperor of the French. Income tax initiatives did re-emerge under the Second Empire again in the form of unsuccessful budget amendments in the Chamber of Deputies in 1855, 1862 and 1863.

While the British electorate grudgingly complied with the income tax in sync with the extension of the franchise, the French inability to pass a modern income tax bill led to a growth in regressive indirect taxation. In the twenty-three elections that took place from the extension of the franchise in 1848 until the First World War, voter turnout, as a percentage of over twenty population, remained fairly constant in France (ranging between 39.9% and 43.7% - see Figure 8), while the proportion of indirect tax revenues steadily *increased* from 61.3% of total tax

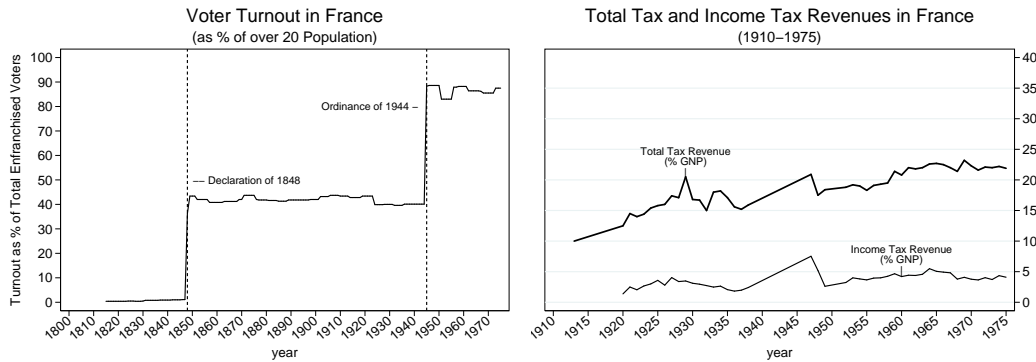
¹⁹Jollivet, J. *De L'Impot Progressif et du Morcellement des Patrimoines*. Paris, 1793

²⁰see J.J. L.Graslin. *Essai Analytique sur la Richesse et L'impôt*. London, 1767

²¹Mace, M. J. 1893 Universal Suffrage in France. *The North American Review*

revenue in 1848 to over 80% during the First World War (see Figure 9). Resistance to the state, along with strong political opposition, remained strong where no incremental dynamic relationship of trust had been formed with the taxpayer, leading to political mistrust and less willingness to supply any form of the much hated income tax.

Figure 8: Extension of the Franchise and Tax Revenue in France

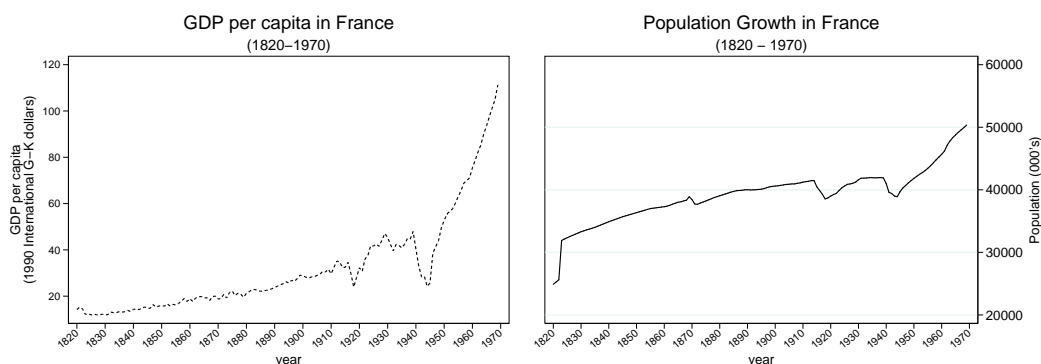


The French also lagged behind the British in wealth. After suffering economic stagnation in the early part of the 19th century, the French economy was being transformed from a land of peasantry to a modern industrial and urbanized country by the end of the century. Positive economic growth between 1880 and 1900 increased per capita GDP by 36%, yet these were still only equal to 1860 levels in the UK.²² It would not be until the post War 1920's, when France experienced average growth rate of 5.52% (compared with 1.32% in the UK), that allowed them to reach comparable levels of per capita GDP. Urbanization and industry was increasing city populations, to the extent that the population of Paris tripled between 1880 and 1936 and industrial employment increased by 45%, the French did not experience the population boom seen in the United Kingdom (see Figure 9).²³ The lag in both economic and population growth meant that taxpayers had less disposable income and government had smaller bases to tax in the unlikely event that a successful income tax bill emerged.

²²Measured in constant 1990 Geary-Khamis dollars. Data from Madison, A. 1995.

²³Data from Gravier, M.J.F. 1947.

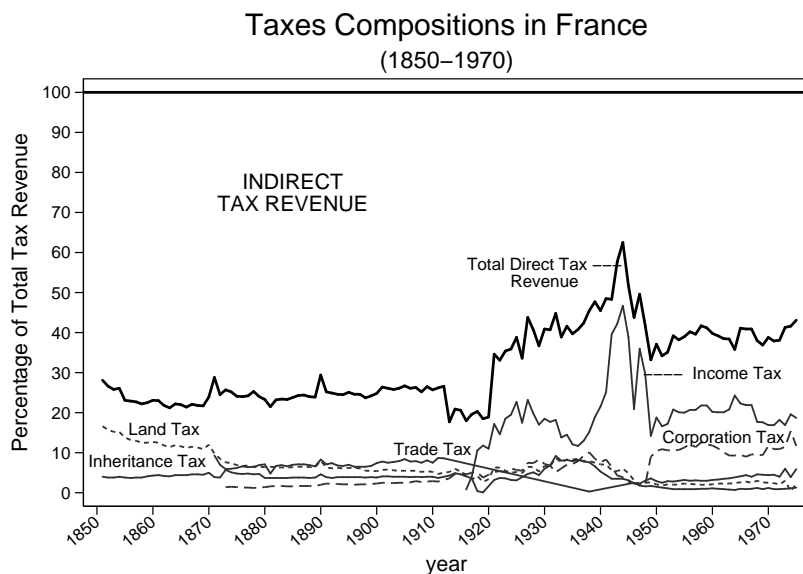
Figure 9: Economic and Population Growth in France (1820 - 1970)



With the political changes of 1870 and 1871 also came new initiatives for a modern income tax, however, political fragmentation and economic volatility led to further delays under the Third Republic (see Figure 12 and Figure 13). New proposals in 1871, 1872, 1873 and 1874, although heavily debated, were defeated by the conservatives who maintained controlling influence in the Chamber of Deputies. Despite a change in the executive and relatively prosperous economy, political fragmentation prevented the passing of income tax bills in 1876, 1877, and 1886 whose defeat “was due largely to the belief that it established an unwholesome precedent and place in the hands of the democracy what might prove to be a dangerous weapon” (Willis 1895). The four legislative assemblies, subsequent to that of 1876, considered almost twenty failed schemes for a modern French income tax. New bills were attempted again in 1896 and 1907 to replace the old direct taxes on, real estate tax, business, door and windows and personal property; also known as *‘les quatre vieilles’* (the four old ladies) of the Constitutional Assembly (Comstock 1929 - also see Figure 10). These attempts were, again, overcome by political resistance until the income tax bill was finally passed through the Chamber of Deputies in 1909 at statutory rates ranging between 3.0 and 5.5%, only to be held up in the Senate until its enactment as an emergency measure two weeks before the First World War. The delayed adoption was not seen as a major problem by French politicians who, much like the Germans, anticipated a rapid victory and planned to pay for the war with reparations exacted from a defeated enemy. The tax bill, which did pass in July 1914, only came into effect in 1916 so that France entered the war with only an indirect tax arsenal.

By June of 1918, France had quickly established a progressive modern income tax system with a maximum statutory rate of 20 percent (Comstock 1929). The wartime tax gave the government

Figure 10: Tax Compositions in France (1850-1970)



an initial patriotic credibility in the eyes of the taxpaying population to the extent that income tax revenues grew dramatically from 0.8% of total tax revenue in 1816, to over 10% in 1918 (see Figure 10).²⁴ Although greatly attributable to the event of mass warfare, the speed with which the French expanded their compositional reliance on income tax revenues was also due to the modeling of a tax administration largely based on the British system (Webber and Wildavsky 1986). Along with the economic growth of the 1920's, in March of 1924 the government was able to introduce a twenty percent increase in all taxes (the '*double decime*') to finance the extreme debt accumulated during the First World War (see Figure 8). By December of 1925 total taxes were increased by about 50%, and the rates of the general income tax by 20%, leading France to collect higher levels of tax revenues than the tax machine of the United Kingdom (see Figure 1). In 1926, the tax system was reformed again, leading to maximum income tax of 30% (down 60% from earlier law).²⁵ Sixty-eight years after its initial introduction in the Chamber of Deputies, the combination of mass warfare, economic growth, and administrative reforms in the most durable regime France had experienced since the early 18th century, led to the creation of a modern income tax which would become a permanent feature in a post war setting.

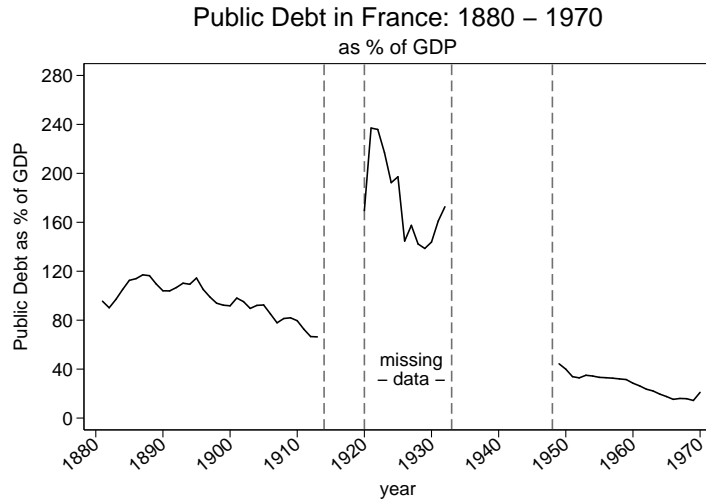
²⁴Source: Flora et al. 1983.

²⁵see Comstock p.97 for rates & p.98 for yields

Much like in the United Kingdom, the accumulation of debt in the 19th and 20th century was largely associated with years of war in France. From the beginning of the Second Empire in 1852 until 1873, the Crimean, Italian, Mexican and German wars, along with additional loans to Prussia, increased the public debt dramatically to 21,700 million francs, up from 5,954 million in 1848. With the historical unpopularity of debt, the four decades of peace that followed (1873-1913) led to only moderate increase of the public debt by 55%. During this same time period, the benefits of the early passing of an income tax bill can best be seen comparing the accumulation of public debt between France and the United Kingdom, where the French debt was increasing twenty-seven fold between 1814 and 1914, while debt obligations of England were declining 25% (Hamilton 1947 - also see Figure 7 and Figure 10). Limited to revenues from indirect tax sources led to inevitable large scale debt financing of the First World War to the extent that, between 1914 and 1919, tax receipts covered only 16.5% of total spending with the remainder financed by loans (Daunton 2002). Mass warfare led to dramatic increases in public debt to the extent that, by 1918, it was five times that of 1914 levels at 154,393 million francs. Despite reparation payments from Germany, this figure more than doubled again by 1924 to 315,896 million francs. The economic boom and tax measures taken in 1924 and 1925 led to a short lived period of fiscal surplus's and debt repayment, however, depression, followed by military preparations for the Second World War, led to further increases in the public debt to 412,575 million francs by December of 1938. The level of debt accumulated by France by 1940 led scholars to believe that "if the huge public debt now outstanding is not partially repudiated, as was the fashion before 1789, or largely paid in worthless currency, as during the Revolution, it will doubtless depress the level at which the franc will finally be stabilized and thus inflict another loss upon the already impoverished salaried workers and other recipients of fixed incomes", as was the case in the early part of the decade where GDP per capita decreased at an average rate of 12.5% between 1940 and 1945 (Hamilton 1947; also see Figure 13).²⁶

²⁶Data Source: Maddison (1995)

Figure 11: Public Debt in France (1880-1970)



Economic stagnation in the early 40s was quickly followed by *‘Les Trente Glorieuses’* (Thirty Glorious Years) with GDP per capita growing at an average annual rate of 6.6%.²⁷ Much like the case in the United Kingdom, direct taxes continued to grow in this post war setting, initially to repay large war debt, followed by taking on a political role as a tool for social justice and political pragmatism, yet traditional resistance to this intrusive form of taxation kept levels relatively lower. By 2008, general government total revenues made up around 48.2% of GDP with income tax making up 18.3% of total revenue and a top statutory rate of 40%.²⁸

3 Discussion

The extreme expenses associated with the exogenous fiscal shocks of large scale war gave 20th century governments three financing options: the accumulation of debt, increases in tax revenues, and inflation. With respect to the tax revenues, a reliance on indirect sources of taxation, such as the excise, taxed commerce through consumption and trade. The former diminished trade in a time when commodities were in high demand, and, the latter were not a reliable base in times of war as commercial wealth was predominantly with the producer. This made it impossible to tax finance any prolonged war without new tax instruments. An expansion beyond traditional

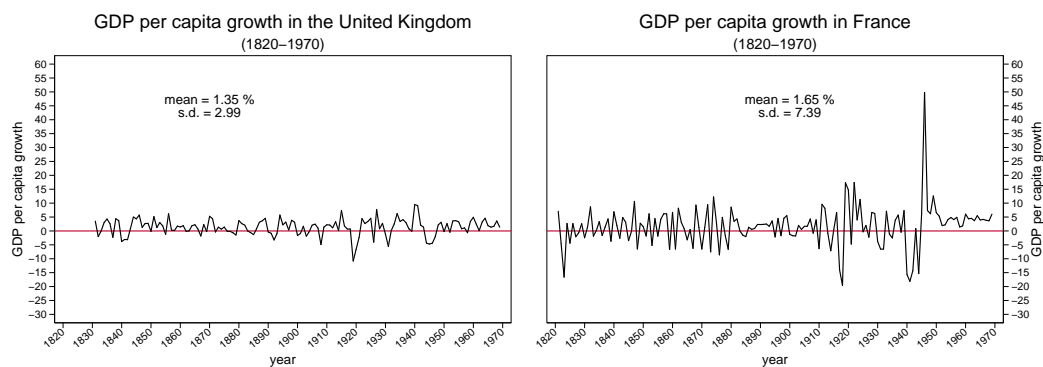
²⁷Data from Maddison 1995.

²⁸Source: IMF Government Finance Statistic, IMF International Finance Statistics and World Bank World Development Indicators

indirect means of tax financing, however, meant that the state had to create new and credible tools which provided lucrative tax revenues along with an atmosphere of political trust and legitimacy in order to feasibly gain taxpayer compliance. For states who used incremental bargaining to successfully finance relatively larger proportions of war through current taxation, such as the United Kingdom, this led to a significant and permanent compositional shift in revenue structures where “the ‘ability to pay’ principle was taken to some remarkable extremes” (Steinmo 2003). In short, war instigated large increases in the demand for government revenue in an atmosphere where balanced budgets were a social norm. Although the accumulation of war debt was inevitable, it was both morally, as well as theoretically, unpopular, making the introduction of tax bills at least an equal amongst two evils.

Tax mobilization to finance mass warfare was not possible without large tax bases. The unprecedented economic growth that began with the Industrial Revolution, as well as increases in trade (in years of peace), allowed western European economies to grow at unprecedented rates in the 19th and 20th century. Figure 12 shows levels of growth, where GDP per capita averaged around 1.5% in France and the United Kingdom, with relatively small deviations in the latter over the 1820-1970 period.²⁹ Although initially plagued by stagnation and volatility, by the end of the Second World War, this growth persisted to the extent that, by 1970, GDP per capita had increased to over four times 1945 levels in France, and one and a half times those in the United Kingdom.

Figure 12: Economic Growth in the United Kingdom and France (1850-1975)



With a modernized industrial economy and population growth came large compositional changes in the labour force as well as increased disposable income for those on the upper end of the income distribution (income tax was initially very progressive with small statutory bases to

²⁹Data from Maddison (1995). Computations by author.

finance the war— see Webber and Wildavsky 1986; Aidt and Jensen 2009; Scheve and Stasavage 2010). Modernized industrial economies brought higher wages which, with the organization of labour, contributed to a reduction in income inequality and enabled governments to expand this lucrative new base leading to a greater emphasis on broad based income taxes paid by the majority of income earners.

Although *potential* income tax bases were growing, the compositional shift in revenue structures was only made feasible with centralized and efficient methods of revenue collection. Organizational advancements in tax technology that came with the “managerial revolution”³⁰ which transformed tax collection efficiency through an accountable bureaucracy and tax creativity, such as Henry Addington’s stoppage at the source (which was mimicked by all other European states), allowed governments to access tax bases that were administratively infeasible prior to these advancements or constitutionally prohibited (as was the case in Germany).³¹ Tax compliance was also fundamental to the administrative feasibility of direct taxes. The nationalistic tendencies that existed in war years were sufficient to gain compliance from patriotic taxpayers, however, in years of peace this appears to correlate with the political landscape of the state, where taxpayers exchanged their voice in public policy decisions for compliance on relatively difficult to administer progressive bases.

In order for tax revenue to grow without revolt required that government pay a political cost of becoming accountable to an unprecedentedly large and diverse group of citizens. A new political landscape, overseen by the masses, was an effective way to create the aura of legitimacy necessary to administratively extract new revenues. This ‘quasi contractual’ agreement between taxpayers and government has been found to be significantly correlated with compositional changes in revenue collection; predominantly, the adoption of a modern income tax (Webber and Wildavsky 1986 chapt.9; Levi 1988; Steinmo 2003; Aidt and Jensen 2009). Successful implementation of direct taxation, however, relied on a political relationship of both static and dynamic trust with the taxpayer and continual compliance with new tax initiatives. For example, while Britain forged a political relationship incrementally with the introduction of new direct taxes, French attempts to put in place drastic static measures in an unstable and fragmented legislature would greatly postpone their introduction. Some evidence of this ‘durability’ effect can be seen in Figure 13 which shows the relationship between income tax revenues and the number of uninterrupted years a regime has been in power³², as well as fragmentation in the

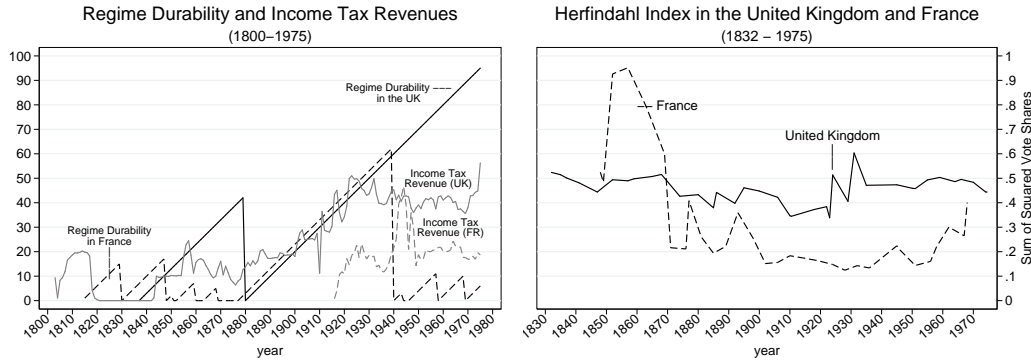
³⁰see Webber and Wildavsky 1986, p.329

³¹Under the constitution of 1870, direct taxation was controlled by states and municipalities, leaving the central government constitutionally limited to collecting revenues through indirect means. Until 1906, all central government revenues was confined to trade taxes (excise and customs), and, until 1915, made up over ninety-five of total tax revenues. (Data Source: Flora et al. 1983. Also, see Aidt and Jensen 2009 p.368

³²This is measured as a 3 point movement in a countries Polity Score (see Marshall, M., Gurr, T. R. and

legislature (measured by the Herfindahl Index), in the United Kingdom and France. These initial findings are also consistent with theoretical contributions of Besley and Perrson (2007) where high political stability and lower institutional polarization leads to greater investment in fiscal capacity.³³

Figure 13: Regime Durability, Income Tax Revenues and Fragmentation in the United Kingdom and France (1800-1975)



While the centerpiece of the initial shift from regressive indirect to progressive direct taxation (as well as the dramatic growth of tax revenues) was the need for war financing, the historical insistence that this instrument be reserved for war was implicitly dismissed by the end of the Second World War in most advanced economies. By the time war debts were repaid, the income tax was kept in place in advanced economies despite peace. These revenues have become an integral part of modern fiscal structures where newly enfranchised voters became politically motivated by the idea of redistributive justice unachievable with regressive taxation, and, revenue hungry governments were willing to form credible fiscal contracts over time in order to extract them. The “changes in the tax structure brought on by the war” were to become “the foundation for new ‘ideas’ after the war” (Steinmo 2003). A more in depth evaluation of these modern structures of public finances, where many of the worlds advanced economies have endured very little war, will be provided in Section 2 where the role of economic development, administrative costs and politics take on a central role.

The effect of a changing economic, administrative and political landscape led the way for mass society to entrust government with unprecedented levels of fiscal flexibility, not only in ability

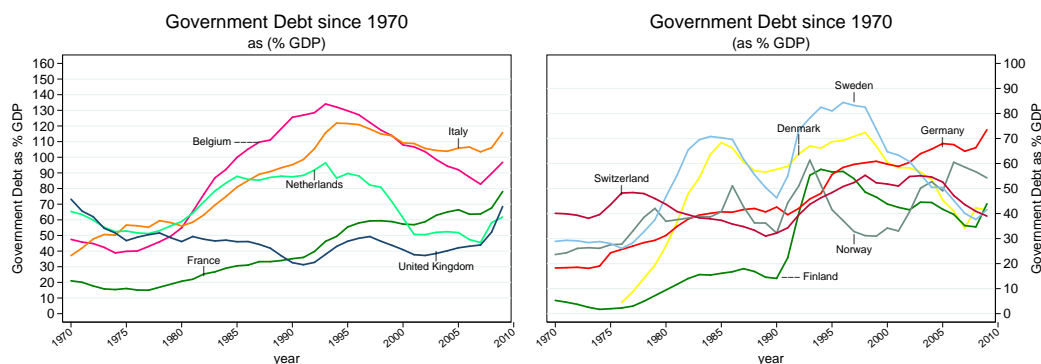
Jagers, K. 2009. *Polity IV Project*

³³Source: Flora et al 1984; Polity IV; Roi et President (<http://www.roi-president.com>) and Craig, F. W. S. *British Electoral Facts: 1832-1987*. (Herfindahl Index computed by author).

to tax, but the accumulation of peacetime debt as well. Accepted macroeconomic theory in the 19th century regarded deficit financing as a shift in the tax burden to future generations where lifetime consumption of future representative individuals would necessarily have to decrease in order to finance the debt of past generations. In this neoclassical context, deficit financing placed an unfair burden on generations who inherit the debt of past generations as well as crowded out private investment, creating dynamic distortions in the market. This made the accumulation of debt unpopular with both policymakers as well as the masses. While the majority of historical debt was accumulated in years of war, in a post depression world, macroeconomic theory began to question the general equilibrium assumption of the neoclassical framework. Assuming that some economic resources were underemployed allowed increases in government spending to generate increases in national income through the now famous ‘multiplier’ effect, where national income rises at a rate greater than unity with unit increases in government output. In this new framework, deficit spending was able to generate increases in both consumption and income, making it possible that no adverse effects on capital accumulation need occur. This new line of thinking was also a popular way for politicians to justify the use of peacetime deficit financing to revive a stagnating economy.

Policymakers were now given the theoretical grounding which allowed them greater access to discretionary funds in years of peace. Discretionary fiscal power, however, requires those who hold this power to use it for the maximization of social welfare. Despite peace since the mid 20th century, persistent deficits in most advanced economies in the seventies and eighties led the research community to question the benevolence, or responsibility, of government when it came to the the creation of fiscal policy. Figure 14 isolates the accumulation of public debt, from Figure 3, to post 1970 peace years. By this time, war debts had been paid off by the majority of these countries, yet public debt was on the rise.

Figure 14: Government Debt since 1970



From this perspective, fiscal distortions have been shown to arise where the full costs of the budget are not fully internalized by meaningful actors, making optimal policy changes impossible due to a large number of fractionalized veto-players, or finite horizon policymakers, who exhibit higher discount rates than those of the general population. In the case of finite horizon actors, this problem lays at the core of the democratic systems which made the income tax feasible. Where incumbent government possess a non-zero probability of losing power come election time, the likelihood that they will internalize future financial burdens diminishes. While war laid the foundation for new progressive tax systems that would come to dramatically change the composition of government revenues, it came at the cost of putting in place an institutional framework that hinges on uncertainty about the future. This phenomenon will be examined in greater theoretical detail and empirically tested in section 3.

Part II

The Political Economy of Fiscal Systems: The Revenue Side

Abstract

Recognizing that government revenues are made up of several distinct instruments from which government can distribute the burden of financing the state requires a disaggregated examination of the tax and non-tax arsenal. Using an integrative approach which considers administrative, economic and political constraints faced by policymakers, this paper examines factors which help to explain differences across overarching political institutions which frame government's relationship with the taxpaying population. Taking explicit account of the unit simplex constraint associated with compositional systems of budget equations, the findings in this paper suggest that political regimes, as well as government durability, *do* have significant and robust correlations with the way policymakers compositionally distribute the tax burden using a globally representative sample of 90 states over the 1990-2008 period. While these findings shed new insight into one of the black boxes of structural heterogeneity in tax structures, the micro level causal factors still require greater attention before we can gain a complete understand of why differences exists in revenue systems.

2.1 Introduction

"All things are poison and nothing is without poison, only the dose permits something not to be poisonous." - Paracelsus -

To date, a great deal of literature on the political economy of public finance has focused predominantly on the size of government (Olson and McGuire 1996; Niskanen 1997; Cheibub 1998;

Mueller 2002; Persson and Tabellini 2003). This emphasis on government capacity fails to disaggregate the methods by which governments distribute the burden of financing the supply of public goods and services, as well as the redistribution of income. Revenue compositions pose a different question altogether of *how* this burden is distributed rather than the level at which it is felt. Large variations in economic, political and administrative costs across revenue sources become masked in aggregation leaving the research community with a less than sufficient compositional picture of what has only recently summed to an unprecedentedly large proportion of societies total output. This is to say that public finances are fundamentally multidimensional and characterizing them with a single metric ignores the fact that governments possess several means of financing the state, each of which comes with varying implications for the society onto whom they are imposed, as well as those who impose them. A consideration of the objectives, as well as the level of discretionary power held by political actors who construct fiscal policy, has remained one of the 'black boxes' in the public finance literature which is especially true in the case of governments who do not function under formal institutional constraints. Given that public finance is not exclusive democratic regimes, which, as of 2006, accounted for only fifty-nine percent of the worlds states, the inclusion of these states is necessary for a complete understanding of international systems of public finance rather than a democratic subset thereof.

The sparse theoretical literature in this area has been analytically over-reliant on the outdated Leviathan hypothesis which has received very little empirical support; nor does it contribute any insight into how unconstrained policymakers would compositionally distribute the tax burden differently than constrained policymakers, *given* its total size. Other theoretical approaches (Fiscal Exchange and Optimal Taxation) do not incorporate unconstrained policymakers into the analysis as these are assumed to either function within a bargaining (Fiscal Exchange) or benevolent planner (Optimal Taxation) framework. In short, there has yet to emerge a consensus on whether democratic accountability is a significant determinant of public finance structures, or exactly what role they play (Olson and McGuire 1996; Niskanen 1997; Cheibub 1998; Mulligan Gil & Sala-i-Martin 2004; Acemoglu and Robinson 2006; Winer and Kenny 2006; Winer et al 2009). This is especially true in the case of revenue compositions where next to no research has been conducted.³⁴

This paper empirically tests theoretical expectations for both the size of state as well as revenue compositions from the Leviathan, Fiscal Exchange, Optimal Taxation with Endogenous Government, and Administrative Cost literature, across a large sample of ninety states over the 1990-2008 period. The empirical approach is the first to explicitly take into account the unit simplex constraint in compositional systems of budget equations, where past research into the

³⁴(the few exceptions being Aidt and Jensen 2009, Winer and Kenny 2006 and Timmons 2010)

political effects on budget compositions has either neglected this constraint or relied on *ad-hoc* tests to verify that the right hand side parameter estimates fall within the unit simplex across equations. Regressing untransformed revenue shares also neglects the spurious correlations between the dependent variables in the system of equations leading to uninterpretable covariance structures. This paper is also the first to consider the effects of exogenous non-tax revenues on government's choice of tax compositions.

Although a central theme of this paper is to advocate a more comprehensive approach to the study of tax systems, the primary focus is on revenue compositions across the broad political dimension of democracies and non-democracies for two reasons. Firstly, the institutional construct of democratic regimes has most commonly been (implicitly or explicitly) incorporated into the collective choice-public finance literature generating some expectations regarding the effect of incorporating the masses into the policy-making process on fiscal outcomes. Secondly, the existence of a niche of literature comparing fiscal structures between democratic and non-democratic regimes provides an analytical and empirical benchmark to work from. This leaves within-regime institutional effects on tax structures an understudied area for future research.

The findings are relatively consistent with those found in the only other existing study of this kind where tax structures are examined across political institutions over the earlier 1975-1992 period (Winer and Kenny 2006; Winer et al 2009). Modern advanced democratic economies tend to place significantly greater emphasis on large progressive bases (such as income taxes), relative to advanced non-democratic economies, who rely to a greater degree on non-tax sources to financing the state. While progressive income tax revenues are found to provide significantly larger proportions of revenue in democratic regimes, corporate taxes do not appear to have any significant correlation with regime type, suggesting that accountable regimes may also take into account the relative inelasticity, or lower economic distortions, from using income taxes as a tool for redistribution of income. The large progressive (income) tax differential across regime type is much less pronounced in developing and emerging economies where these government face tax technology constraints which render these taxes economically infeasible, regardless of whether a quasi-contractual 'taxation for representation' agreement exists between government and taxpayers. These states rely, instead, on easier to administer bases such as taxes on goods and services and international trade. There is also evidence of a regime durability effect suggesting that long lived regimes can foster higher levels of trust and tax compliance from taxpayers allowing them to extract revenues from more difficult to administer bases, independent of regime type. Finally, there is some evidence that the threat of revolution will lead governments to make greater use of progressive bases in order to appease the revolutionary masses, however these effects are not robust and require further analysis. The general findings confirm that

political structures do influence fiscal outcomes and have important policy implications, in that, governments who incorporate civil society into the policy making process have greater access to difficult to administer tax instruments, effectively allowing them a more diverse toolbox of fiscal instruments. However, these new revenues come at a cost of placing limits on their discretionary policy-making powers or risk being thrown out of office.

Part I of this paper will provide a brief overview the existing normative contributions to tax theory from political economic and administrative cost perspectives. Part II will overview the few empirical contribution to state size, as well as revenue compositions, and regime type concluding with a preliminary overview of revenue compositions for the 1990-2008 period. Part III will overview the data, and, Part IV will provide a parametric test for the hypothesis derived in Part I taking into account the unit sum constraint of the compositional system of budget equations. Part V will briefly discuss the implications as well as limitations of the empirical findings for collective choice-public finance literature. Part VI will conclude.

2.2 Normative Tax Theory

In the late 18th century, Adam Smith defined four criteria for good taxation as *efficiency*, *equity*, *convenience*, and *certainty*. Normative theories of taxation have since developed a tendency to analyze these criteria independent of one another allowing for greater insight within these dimensions but at the cost of a comprehensive understanding of how tax systems actually function in practice. This has the potential to explain why tax theory has consistently been far removed from real world structures (Slemrod 1989; Cullis and Jones 1999; Slemrod and Yitzhaki 2002). While classical political theory puts emphasis on the objectives of fiscal policymakers and the institutional/constitutional constraints put in place to ensure that governments act as just representatives of the societies they govern (*equity*), the neoclassical economic literature puts greater emphasis on the relative distortionary effects of tax instruments in the private market with the objective of minimizing these costs while maintaining a socially optimal size of government (*efficiency*). Although both approaches seek normative solutions which structurally induce Pareto optimal tax outcomes, the point of contention has been the objective function of those who create fiscal policy. The first assumes that government officials act as self interested utility maximizers who require institutional constraints in order to align policymakers objectives with those of the collective; while, the second assumes government officials to be benevolent planners, “reminding the reader of the plays from antiquity where a god descends in a chariot at the end to provide a much needed solution for troubles of contending factions” (Hettich 2002). The post Keynesian growth in levels of fiscal discretion available to policymakers, along with the inability of neoclassical theory to predict real world fiscal outcomes, has led mainstream

public finance to open up the black box containing the objectives of these actors. While modern political theory assumes that the objectives of policymakers are either revenue (Leviathan) or vote maximizers (Fiscal Exchange, Representation Theorem), dependent on whether they face institutional constraints (as opposed to forming fiscal policy unilaterally), no consensus has emerged as to how these actors will distribute the tax burden across available bases. Tax administration (*convenience*) has received the least attention in the political economy literature yet has major implications for the feasibility of tax instruments. This is especially true when considering the mechanisms through which political resistance is manifested; mainly, the role of tax compliance, which may be conditional on the political landscape of the state. This section will provide a brief overview of theoretical contributions from the Leviathan, Fiscal Exchange, Optimal Taxation with Endogenous Government and Administrative Cost literature, forming five testable hypotheses regarding the composition of revenues across political regimes.

Leviathan

The Leviathan hypothesis assumes that “politicians and bureaucrats, like most other human beings, are very much preoccupied with their own welfare...”, making the tax mix decision a unilateral one for unconstrained policymakers (Brennan and Buchanan 1980; Breton 2002). Full budgetary discretion does, however, fall under a public goods constraint for any ruler hoping to secure their future reign, where “stationary bandit” policymakers maximize their residual levels of revenue, firstly preserving a reputation as a “public good providing king” by financing fixed costs such as defense and the provision of essential government services in order to maintain the productive capacity of the state over time, as well as ensuring some degree of compliance without taxpayer revolt (Olson & McGuire 1996; Niskanen 1997). This leads to the prediction that unconstrained (non-democratic) policymakers will generate higher levels of revenue than constrained (democratic) policymakers by only providing a level of public goods which ensures the stability of his/her future residual wealth from taxation. Because these unconstrained policymakers are expected to have “no marginal benevolence or malevolence” (Niskanen 1997) with respect to the general population that they rule, the only context under which the interests of such governments will align with those of the private market is through the existence of a beneficial, or intrinsic, desire for public support.

Wintrobe’s (1990) in depth analysis of non-democratic regimes suggests that unconstrained governments will put weight on both public support as well as their own interests, depending on their cost and benefit schedules. In this context, policy formation becomes a convex combination between the two, weighted by a ‘*loyalty*’ parameter which defines the degree to which a government adheres to the policy preferences of the general population in exchange for higher levels of tax compliance; and, a ‘*repression*’ parameter defining the degree to which governments

pursue their Nash utility maximizing policy preferences. Much like the findings of Olson and McGuire, optimal tax rates become a function of the degree to which governments internalize the distortionary burdens of taxation, effectively increasing their demand for loyalty from the populations they rule. One factor that may induce the leviathan to internalize the full revenue burden felt by the masses is the potential for revolt which would deter unconstrained policy-makers from maximizing net revenues from the population subject to its rule (Niskanen 1997). Acemoglu and Robinson (2006) build on this threat of revolution compositionally, arguing that leviathan regimes who are subject to a credible and binding revolutionary constraint will set redistributive taxes at a level which appeases the poor, preventing a revolt by redistributing income back to them.

The Leviathan hypothesis characterizes tax structures as being unilaterally set by policymakers under two constraints. The first is a consideration of maintaining the stability of future revenues, while the second is the potential for revolution under the current distribution of the tax burden. Where a credible threat of revolution does exist, both the taxpayer and policymaker have the ability to influence fiscal policy outcomes. Likewise, as the interest of government converge on those of the private market economy (i.e. as more participants in the private economy receive a voice in government or societies become more equal), so too does the degree to which government internalize the distortionary (political and economic) burdens incurred by the taxpayer. In order to tame the self interested profit maximizing leviathan, therefore, requires structural or revolutionary constraints which induce them to feel the same fiscal burdens as those felt by the taxpaying population.

Fiscal Exchange

Fiscal Exchange theory is concerned with the formalization of these structural constraints, producing mutually beneficial gains for the taxpayer and policymakers. In this framework the tax problem is conceived as a bargaining game where government exchange fiscal accountability for additional tax revenues ('taxation for representation'). In order for this exchange to be credible in the eyes of the taxpayer, governments must signal a commitment by imposing binding institutional/constitutional constraints on those who create, approve, and implement fiscal policy (Levi 1988; North 1990; Brennan and Buchanan 1999). North and Weingast (1989) argue that rulers can establish such credible commitments in two ways. Firstly, through the creation of time invariant rules that do not permit leeway for violating these commitments, and; secondly, by setting a precedent of commitment to a set of rules that policymakers consistently enforce upon themselves.

The first is static, requiring the creation of self enforcing constitutional rules which cannot

be broken within that regime. Governments signal an initial commitment to these rules through the creation of quasi-contractual or constitutional agreements with taxpayers. The credibility of such agreements requires that there exist perceptions of a bargain between government and citizens; that is to say that the marginal political cost to policymakers (loss of discretionary power) and economic loss to taxpayers (loss of income) must be offset by the marginal benefit (higher revenues and provision of public goods, respectively). This feature is commonly seen as being highly correlated with the existence of democratic institutions where revenue seeking governments create formal agreements with taxpayers exchanging checks on their policy-making power in exchange for higher tax revenues as was the case in late 19th and early 20th century Britain. Taxpayers are then given the ability to opt out of these agreements by forming new agreements with non-incumbent policymakers, creating an incentive for those in power to credibly commit to fiscal contracts or face being thrown out of office.

The second way in which governments can establish a credible commitment is through a dynamic process where regimes form a reputation with the taxpayer over time, creating an assurance that both sides will keep their part of the bargain (Levi 1988). The more long lived or durable a regime, the more credible is the precedent of commitment (the “long arm of the future” - North and Weingast 1981 p.807). Unlike the first condition, dynamic credibility is not correlated with democratic governments as reputation does not necessarily require a written, or formal, agreement, but does require a public finance structure which consistently alleviates any revolutionary threat. From this perspective, long lived democratic regimes will receive fiscal exchange benefits from two independent avenues (formal agreements and reputation), while short lived non-democracies will have no credibility in the eyes of the taxpaying population forcing them to put greater weight on the repression parameter when it comes to collecting taxes.

From a compositional perspective, there are two ways to characterize Fiscal Exchange theory. The burden of supplying additional revenues has been argued to be distributed either proportionally on those who gain political power (‘taxation for representation’), or, indirectly through the shift in demand for tax policy created by the newly empowered median voter within the enfranchised electorate. In the former scenario, levels of redistribution preferred by the median voter are an increasing function of the distance between the median and mean income earner subject to the constraint of maintaining sustainable levels of future revenues. Given the skewness of income density within states, this implies that the median voter will prefer progressive bases which effectively allow for the redistribution of income back to themselves. The direct ‘taxation for representation’ fiscal exchange hypothesis, on the other hand, would predict compositionally larger increases in regressive, or neutral, taxes, as those who gain political power end up paying

for it (Timmons 2010).

The downfall to the fiscal exchange literature is the lack of a comprehensive framework which incorporates both the political (loss of power), as well as economic, costs (deadweight losses). Where tax instruments have relatively greater economic consequences in the private market, we should expect these to be taken into account when formulating fiscal policy. While the Leviathan and Fiscal Exchange literature provide some insight into how political institutions may affect both the degree to which government use, as well as the implicit structure of, the tax burden, there is no accounting for the economic consequences of specific instruments which will also impact any government revenue allocation decision. Nor is there any explicit decomposition of how the new tax burden will be distributed across bases once these contracts are formed.

Optimal Taxation with Endogenous Government

Optimal Taxation views government's taxing power as equivalent to that of a monopolistic price setter seeking to create the most efficient wedge between consumer and producer prices with the net sum of profits used to finance the optimal supply of public goods. In its neoclassic form, government is exogenously assumed to act as a benevolent planner when forming tax policy. Policymakers seek to impose a tax structure which creates the least distortionary economic burdens on consumers and producers in the private market, taking into account the tax technology required to enforce each base. Assuming that non-distortionary poll taxes are infeasible, and, given a well defined concave social welfare function, governments can achieve a second best tax allocation solution by equalizing the marginal excess burdens per dollar raised across taxpayers and available tax bases (Ramsey 1927; Diamond and Mirrlees 1971). Differences in optimal statutory tax rates emerge because of distortionary differences across individual taxpayers economic behavior or reaction to tax policy. In the simplest case (no cross elasticities of demand) this leads to the 'inverse elasticity rule' where governments set tax rates for any taxable activity as an inverse function of the elasticities of demand for that activity. Asymmetric elasticities allow increases in some bases to be less distortionary than others and economically more appealing for government to tax at higher statutory rates. Assuming that consumer behavior does not systematically differ across regime type (i.e. individuals have intrinsically similar utility functions regardless of who forms the fiscal policy that governs them), we should expect that, if policymakers are benevolent, no differences will emerge in fiscal structure as all policymakers should seek the most efficient cost minimizing revenue structure.

There may, on the other hand, be political advantages to taxing some bases at statutory rates which impose higher marginal excess burdens than others to maximize political support as was implicitly suggested by the Fiscal Exchange and Leviathan literature (Aumann and Kurz 1977;

Slemrod 1989; Dixit 1996; Persson Roland and Tabellini 1998; Winer and Hettich 1999; Hettich 2002; Acemoglu and Robinson 2006; Winer and Kenny 2006). A relevant case would be that of the relatively inelastic progressive base of capital taxation which has puzzled economic theory by not dramatically declining to statutory levels of zero, even within communities like the EU where markets have fully integrated. These disadvantages, which the OT literature itself identifies, are the “omitted political constraints”, noted in one of the fundamental contributions to optimal taxation theory (Diamond and Mirrlees II 1971). Endogenizing the ‘omitted political constraints’ implies that governments are likely to formulate optimal fiscal policy by minimizing the product of economic *as well as* political distortion across bases. Effectively this merges the OT literature with the motivations of political actors (Fiscal Exchange) to produce an economically efficient tax structures conditional on political support but in an explicitly decomposed framework. It is possible that, for some tax instruments, the two have the same tax mix solution (i.e. minimized political cost is achieved by minimizing economic distortion). In this case, the optimal tax solution is that predicted by the OT literature with economically efficient government (i.e. no political effects), whereas; if marginal political costs are not a one-to-one mapping of economic costs, tax rates will deviate from those prescribed by the OT literature. Winer & Hettich were pioneers in the creation of a collective choice-optimal taxation solution to tax decisions. Making use of Coughlin & Nitzan’s (1981) Probabilistic Voting Model they introduced the ‘Representation Theorem’ which endogenizes the role of politics in a collective choice optimal tax framework. ³⁵

Given a population of N taxpayers with the utility of representative taxpayer i defined over the level of public good provision (G), consumption of private good (x_i), and leisure (L_i).

$$U_i(x_i, L_i, G) \tag{1}$$

where income y_i from labour $1 - L_i$ at wage rate w_i ($y_i = (1 - L_i)w_i$) is taxed at a proportional rate t_i and all disposable income is spent on good x :

$$x_i = (1 - t_i)y_i \tag{2}$$

The provision of public goods (G) as well as the tax schedule across taxpayers $\{t_1, t_2, \dots, t_N\}$ are set by government, and taken as given from the perspective of the taxpayer. Because the base on which tax is levied is income (y_i), it is convenient to substituting income for leisure as an indirect choice parameter in (1), individuals maximize indirect utility by equating the marginal rate of substitution between income and consumption to the proportion of net of tax disposable income spent on x :

³⁵For an in depth overview of the Representation Theorem, see Hettich and Winer (1999) chapters 3,4 and 6

$$\frac{-V_y^i}{V_x^i} = 1 - t_i \quad (3)$$

Where V_q denotes the partial derivative of V with respect to q .

Policymakers are assumed to have probabilistic knowledge of what taxpayers desire to the extent that they are able to assess the level of support given their choice tax rate and method of ensuring taxpayers compliance. Assuming that two vote maximizing parties compete for support from a fully enfranchised population, the probability, from the viewpoint of the party, that individual i votes for candidate a over candidate b is:

$$\pi_{ia} = g_i(V_a^i - V_b^i) \quad (4)$$

Where V_j^i is the indirect utility that individual i receives from the platform proposed by candidate j and g_i is the mapping of individual i 's net utility gain/loss from the policy platform of party a which is strictly increasing in $(V_a^i - V_b^i)$.

Assuming common knowledge of these densities, parties form fiscal platforms $\{t_{j1}, \dots, t_{jN}, G_j\}$; $j = (a, b)$ which maximizes the sum of expected support over the population of N voters:

$$\Gamma_a = \sum_{i=1}^N g_i(V_a^i - V_b^i) \quad (5)$$

subject to the budget constraint:

$$G - NTR = \sum_{i=1}^N t_i B_i - A_i(t_i, y_i) \quad (6)$$

where $A_i(t_i, y_i)$ ($A'_t > 0$) are the administrative costs associated with collecting $t_i B_i$, and, $B_i(t_i, x_i)$ is the base size for individual i ($B'_t < 0$), and NTR is the exogenous level of non-tax revenue which is not a choice variable for government. It should be noted that in any case where $G = NTR$, no tax revenue will be required and t_i will be set to zero for all i .

The first order condition for optimal tax rates, given $G, \{t_1, \dots, t_N, \bar{G}\}$ subject to the economic (Base) and administrative constraints in (6) gives³⁶:

³⁶Because both parties will converge on the same fiscal platform in Nash equilibrium, subscripts are omitted (see Coughlin and Nitzan 1981; Winer and Hettich 1999 for proofs)

$$\frac{\left\{ \frac{\partial g_i}{\partial V^i} * \frac{\partial V^i}{\partial t_i} \right\}}{\left[B_i + t_i \frac{\partial B_i}{\partial t_i} - \frac{\partial A_i}{\partial t_i} \right]} = \lambda \quad (7)$$

Where λ is the Lagrangian multiplier associated with the budget constraint and V^i is the indirect utility of individual i which incorporates the constraint in (3).

The advantage to these results is the theoretical decomposition of tax instruments across political, economic and administrative considerations. To the extent that government's compete for public support or loyalty from taxpayers, they will take into account political, economic as well administrative reactions to fiscal policy. The numerator in (7) suggests that governments take into account how taxpayers translate the utility loss from an increase in taxation ($\partial V/\partial t$) into political opposition ($\partial g/\partial V$) which would affect their relative level of support. This political reaction, or 'sensitivity parameter', of voter i indicates the levels to which government's will favor the optimal policy vector of that voter. The degree to which voter i achieves relatively beneficial tax treatment also depends on the elasticity of that base along with the marginal administrative costs associated with an increase in t_i (denominator in (7)).

These results suggest that for any two tax bases/individuals (i, j), policymakers will equate the marginal political costs per unit of revenue (net of administrative costs) gained across these bases:

$$\left[\frac{\frac{\partial g_i}{\partial V^i} * \frac{\partial V^i}{\partial t_i}}{B_i(1 + \varepsilon_i) - \frac{\partial A_i}{\partial t_i}} \right] = \left[\frac{\frac{\partial g_j}{\partial V^j} * \frac{\partial V^j}{\partial t_j}}{B_j(1 + \varepsilon_j) - \frac{\partial A_j}{\partial t_j}} \right] \quad (8)$$

Where $\varepsilon_q = [\partial B_q/\partial t_q * t_q/B_q]$ ($q = i, j$) is the elasticity of base B_q with respect to t_q .

The results in (8) predict that the more economically and politically sensitive voter/base i is to changes in fiscal policy, relative to voter/base j , the less of a tax burden that individual should be expected to face in political equilibrium (given that the costs associated with collecting an additional unit of revenue are the same between i and j). Differences in optimal tax policy imposed on i and j are therefore determined simultaneously by *i*) the political sensitivity of the taxpayer/base to changes in fiscal policy, *ii*) the economic reaction or elasticity of that taxpayer/base, and, *iii*) the administrative costs associated with generating an additional unit of revenue from that taxpayer/base.

The difficulty with these results is the notorious 'black box' of political behavior and administrative costs reflected by the reduced form results for optimal tax rates in (7) and (8). The

sensitivity parameter ($\partial g/\partial v$) suggests that taxpayers who exert greater political reactions to changes in tax policy will be taxed at lower rates (*ceteris paribus*), yet there is no indication of how these 'weights' are distributed across the taxpaying population. There has been some work suggesting interest groups, as well as income levels, may have a systematic relationship with these weights but further micro-level research is required before we can understand how vote seeking policymakers react to these factors.

Lastly, the denominator in (7) reflecting the, net of administration cost, increases in revenue given an increase in t_i is often left under-analyzed in the political economy literature. This is especially problematic when we consider the mechanism through which government, who engage in fiscal bargaining with the taxpaying population, gain access to additional revenues from more difficult to administer bases, suggesting that political influence may also belong in the denominators of (7) and (8) as these governments exchange political power for loyalty manifested by a reduction in the marginal cost of collecting an additional unit of revenue from q , ($\partial A_q/\partial t_q$). Lastly, by assuming policymakers to be vote maximizers constrains, these results only apply to a subset of states which have created quasi-contractual agreements with taxpayers.

Tax Administration

“...in its current state, optimal tax theory is incomplete because it has not yet come to terms with taxation as a system of coercively collecting revenues from individuals who will tend to resist.” - Slemrod (1989)-

Despite receiving the least amount of attention in the academic literature, administrative costs play a fundamental role in the determination of revenue structures. These can be divided into two primary components: the physical cost of extracting revenue and taxpayer compliance. The direct costs of extracting revenue are primarily associated with economic and demographic characteristics of the taxpaying population. For example, urban centers are easier to tax than rural ones, and low population density provides more logistic difficulties for tax collectors (Riezman and Slemrod 1987; Slemrod and Yitzhaki 2002; Winer and Kenny 2006; Timmons 2005). Likewise, population demographics such as those who are receiving, and expecting to receive, social benefits carry implications for current and future taxes which should affect the design of revenue structures. Base size is also of crucial important as countries with very little surplus to tax on one base may have to rely on other bases regardless of the statutory rates they set or whether a fiscal contract is in place or not (Winer and Kenny 2006). Bases which require a great degree of voluntary compliance, such as the taxation of income, also require a level of tax technology which enables policymakers to efficiently obtain sufficient amounts of reliable information regarding personal circumstance as well as ensuring those who pay larger shares of income continue to

participate in the productivity of the nation. Taxpayers themselves must therefore have the ability to read and understand tax forms, implying a threshold level of educational attainment which must exist before some bases become accessible.

Once the economic and demographic apparatus is considered, there is a second requirement that the populations act in compliance with tax policy. While the standard formal framework envisions the rate-revenue relationship as a function of the governments choice statutory rate (t - as in (2), (3) & (6)), there exists a long line of literature on tax compliance, stemming from Becker's (1968) well known economic theory of crime, emphasizing the costs and probability of detection associated with non-compliance leading us to believe that individuals who are instinctively averse to paying taxes (or are rational free riders) will avoid paying them where there is a justifiable reason to do so (Allingham and Sandmo 1972; Reinganum and Wilde 1985; Tanzi and Shome 1993). These models, however, have had a tendency to systematically overestimate levels of tax evasion, leading scholars to explore the role of trust in tax compliance. Mayshar (1991) expands the tax technology function from it's common form (t) providing a formalized model of Adam Smiths four costs of taxation: administration costs incurred by taxpayers, substitution away from the tax base x , active non-compliance (s), and, passive non-compliance ($t = f(t, x, s)$). Taking into account the effects of substitution away from the base and levels of compliance, Mayshar views the tax decisions as a Stackelberg game where government set t_i and taxpayer i follows by selecting their preferred level of compliance (s_i) given t_i , effectively splitting the gains from consumption of x . The resulting 'marginal cost of funds', or the cost of raising an additional unit of revenue, are a function of the tax technology ($f(t, x, s)$) possessed by government which forms the "black box" in Mayshar's model and would create further reduced form complications if substituted into the Representation Theorem for t_i .

Feld and Frey (2002) offer some insight into the black box arguing that taxpayer compliance can be influenced through 'deterrence' and 'morale', where deterrence encapsulates the conventional probability of detection as well as size of punishment, and morale reflects trust in, or loyalty towards, the state. Government can achieve tax compliance by either punishing those who avoid taxes or forming a relationship of trust by internalizing taxpayers in the policy-making process as was suggested in the Fiscal Exchange literature. The latter requires that government form contractually binding agreements with the taxpaying population which constrains their policy-making power yet for some bases this is administratively "cheaper than clubbing people for money" (Congleton 2007; Timmons 2010). The tax morale literature deviates from the standard *homo economicus* framework by emphasizing the role of trust and legitimacy adopting a cognitive psychology approach where intrinsic motivations or cognitive

dissonance lead taxpayers to supply tax compliance independent of the size of punishment or probability of detection (Feld and Frey 2002; Schnellenbach 2006). Feld goes on to argue that intrinsic motivations of the taxpayer can be crowded out by the use of deterrence, leading to no gains from any increase in deterrence beyond this point. Deterrence, therefore has the potential to become a completely ineffective instrument for governments to enforce tax compliance as the crowding effect on morale dominates any further gains. Similarly, the Schnellenbach (2006) model finds that individual taxpayers use tax evasion as a mechanism to punish governments who chose “illegitimate tax vectors.” This would imply, from an administrative perspective, that a purely leviathan government who deviated from a social welfare maximizing OT structure would be punished by extreme tax evasion on large voluntary bases and therefore collect lower revenues than a benevolent policymaker with equal statutory rates and base sizes.

Rational and forward looking policymakers should, therefore, be expected to implement tax rates that incorporate the tradeoff between tax compliance and the distance between the optimal policy vector and that which was actually implemented. From a compositional perspective it is important to note that tax instruments have varying degrees of compliance requirements. For example taxes on international trade, which are imposed indirectly on small geographic areas are relatively easy to administer, while direct taxes on large bases provide the taxpayer with the opportunity to misreport income or evade these taxes altogether. This suggests that ‘taxation for representation’ may be better characterized as ‘tax compliance for representation’ and the denominator in (7) should incorporate the degree to which governments favor morale over deterrence in achieving tax compliance.

What has Tax Theory Taught us about Compositions?

The Leviathan approach takes on the assumption that policymakers are able to act unilaterally as self interested utility maximizers when forming fiscal policy, leading to the hypothesis that these regimes will be driven by a revenue maximization objective function. Pursuing their own policy interests allows these governments to actively avoid the burden of power constraining contractual obligations to the taxpaying population, but this requires a greater use of deterrence to enforce taxation. From an administrative perspective, the use of deterrence, and its crowding out effect on morale, suggests that these governments will face lower levels of compliance and incur higher administrative costs on all tax bases which effectively means ‘no (or at least less) taxation without representation.’ From a Leviathan perspective, we should therefore expect non-democratic governments have a greater compositional reliance on non-tax, relative to tax, sources of financing the state. This leads to the Leviathan hypothesis that:

H_1 : Unconstrained, non democratic governments will make greater use of non-tax sources of

revenue relative to constrained democratic governments.

The perceived threat of being overthrown has also been argued to influence the tax choice of policymakers where the likelihood of revolution has been argued to cause these governments to put greater emphasis on redistributive taxes, signaling a commitment to those who pose the threat by redistributing income back to them in order to quell the threat (Niskanen 1997; Acemoglu and Robinson 2006). We should therefore expect that governments who face a higher threat of revolution will put greater compositional emphasis on redistributive progressive tax bases in order to maintain their hold on power by redistributing income to potential revolters:

H_2 : As the threat of revolution increases, governments will put increasing compositional emphasis on redistributive progressive tax bases in order to prevent revolution.

Governments who do engage in fiscal bargaining should expect to receive additional tax revenue as well as administrative benefits from higher levels of tax morale making large progressive bases relatively cheaper and more accessible. We should therefore expect that democratic regimes will have greater/cheaper access to administratively difficult tax bases by creating quasi-contractual agreements fostering an atmosphere of trust, which, in turn increases levels of voluntary tax compliance. The compositional burden of these new revenues has been argued to be distributed either proportionally across newly enfranchised taxpayers ('taxation for representation'), or, indirectly through the preferences of the newly empowered median voter. In the direct fiscal exchange scenario we should expect that democratic regimes will favor large regressive or neutral tax bases as newly enfranchised taxpayers incur the direct cost of political inclusion. In the median voter scenario we should expect that democratic regimes will favor redistributive progressive bases. This leads to the following two hypotheses:

H_{3a} : Extension of the franchise will lead to a compositional shift in favor of redistributive progressive tax bases rather than regressive or neutral bases.

H_{3b} : Extension of the franchise leads to a compositional shift towards large regressive tax bases as the newly enfranchised taxpayers incur at least an equal proportion of the cost political empowerment.

In situations where the revolutionary constraint has not led to a regime transition, long lived regimes should be expected to have put in place socially acceptable tax systems, giving them greater credibility with the taxpaying population. In effect, this signifies the existence of an unwritten fiscal contract between government and the taxpaying population, where policymakers tailor fiscal policy to prevent taxpayer revolt. The unwritten nature of this contract implies that irrespective of regime type, more durable regimes should be able to generate higher levels of revenue from progressive basis in order to maintain a low threat of revolution. In the case

of democratic regimes, these contracts are formalized through the creation of constitutional boundaries on their fiscal policy-making power which creates an additional effect to that of regime durability predicted by H_{3a} and H_{3b} . We should therefore expect that long lived regimes will put greater emphasis on progressive tax bases relative to short lived regimes:

H_4 : More durable regimes will be better able to collect taxes from progressive tax bases, independent of the existence of a formal agreement with the taxpayer.

Finally, as governments internalize the total social costs of taxation through the creation of quasi-contractual agreements, neoclassic Optimal Taxation argues that governments will take into account the economic distortions caused by an additional revenue collection. Both the Leviathan as well as Fiscal Exchange literature argue that as these governments internalize the social burden of tax policy, the greater will be the emphasis they put on maximizing social, relative to individual, utility. Combined with the administrative cost literature, it should be expected that, in exchange for maximizing social welfare, taxpayers provide relatively greater levels of voluntary compliance increasing the availability of difficult to administer large scale bases. Incorporating the Representation Theorem into these results, if H_{3a} were to hold, we would expect that, while government will consider political reactions to tax policy by favoring progressive tax instruments (Fiscal Exchange), they will also consider the relative elasticities of tax bases (ε_q). Given the relative elasticity of corporate to income tax we should therefore expect social welfare maximizing governments to put relatively greater emphasis on the less distortionary progressive base of income tax base as it becomes politically and administratively feasible.

H_5 : The increased emphasis on progressive taxation desired by the electorate in democratic regimes will increasingly favor relatively inelastic bases in order to maximize economic efficiency by minimizing distortions in the private market.

2.3 Positive Contributions to Taxation

“The leap from the blackboard to the real world is a large one when it comes to taxation” - J. Slemrod (1989) -

Moving from a normative to positive framework requires a large jump from tractable analytics to the multidimensional world of real world tax administration. In the past century the majority of governments worldwide have developed complex and highly bureaucratic systems of public finance, extracting revenues (proportional to GDP) which would have amazed economists of the early 20th century (see Daunton 2002 p.42). Not only have governments grown to unprecedented levels, but the composition of revenues has dramatically shifted from a system highly reliant on

indirect taxes to one that is equally balanced between direct progressive and indirect regressive taxes. This section will briefly overview select contributions to the size of government across regime type followed by a discussion of the limited contributions to the political economy of revenue compositions.

Size of Government

The majority of globally representative empirical contributions have focused on state size effectively testing, and in most cases rejecting, the leviathan hypothesis. In a 30 year averaged sample of 115 states Casey, Mulligan and Sala-i-Martin (2004) find insignificant evidence of a conditional association between government consumption, education spending and democracy (Polity IV). They also find some evidence of a peculiar significant negative association between democracy and the tax-to-GDP ratio for the 1973-1990 period indicating that contrary to H_1 , non-democracies collect greater levels of tax revenue. This finding has subsequently been disproved in other studies of regime type effects on government size. In a pooled sample of 108 countries for the 1970-1990 period Cheibub (1998) finds evidence that democracies collect, on average, over one percent of GDP higher revenues than non-democracies concluding that democracy does have a positive impact on government's extractive capacity. This finding contradicts those predicted by the leviathan models where unconstrained governments are expected to generate significantly *larger* revenue shares, but does provide support for the fiscal exchange hypothesis where governments exchange political power for additional revenues. Ross (2004) provides anecdotal historical evidence as well as a parametrically tests of the taxation-for-representation hypothesis (H_{3a} and H_{3b}) for a more modern sample of 131 countries between 1971 and 1997. He finds supportive evidence, using a time series cross sectional approach, for a cost-benefit effect of taxation, as a proportion of government expenditure, on levels of democracy (polity IV), but no evidence of a pure anti-tax effect as predicted by leviathan. The consensus from these results is that either democratic central governments collect larger shares of GDP in revenues or there is no statistically significant size, or capacity, difference between regimes. These findings give unanimous evidence against the leviathan hypothesis and some necessary but not sufficient support for the pure OT hypothesis where fiscal outcomes are considered to be independent of regime type altogether. The downfall to characterizing the dependent variable as an aggregate measure of size (tax or total revenue to GDP) is the inability to answer questions about *who pays what*.

Revenue Compositions

Two of the only existing empirical analysis of central government public finance compositions from the revenue side and regime type are Timmons (2010) and Winer and Kenny (2006). In

a sample of 106 countries over the 1970-1999 period, Timmons tests the neo-classical 'taxation for representation' model where individuals provide higher revenues to the state in exchange for greater levels of political participation (horizontal equity), against the median voter model where the decisive median voter passes the tax burden onto those who are relatively more affluent (vertical equity). Using a fixed effects (time and country) specification on an unbalanced panel, his findings suggest that, although there exist no immediate, or static, effects on tax levels or structures in the year in which countries democratize, there do exist medium term dynamic effects. Recently democratized governments are found to make significantly greater use of regressive consumption taxes as they consolidate the new regime over a ten year period. As in Ross, these findings support the 'taxation for representation' hypothesis with a ten year lag, where the median voter incurs at least an equi-proportional share of the tax burden rather than passing it off to others. Timmons also finds some evidence that democracies collect larger levels of total, and progressive, tax revenues (income and capital), yet these findings are not robust to alternative specifications.

In a sample of 100 countries over the 1975-1992 period, Winer and Kenny find that significant differences do exist between regime type and progressive tax bases once they are decomposed into separate categories of income and capital. Given the dramatic differences in the makeup as well as size of these bases, there is reason to believe that they should have differing political as well as economic costs. Corporate taxes are imposed on a much smaller base which makes them much easier to administer than income taxes regardless of whether there exists a quasi-contractual agreement between taxpayers and government. This is consistent with the finding that corporate tax revenues do not significantly correlate with regime type but do show a significant correlation with socialist regimes indicating an ideological motivation for making greater use of this base, independent of regime type. (Winer and Kenny 2006) Income taxes are imposed on much larger bases, making them more difficult to administer where there exists low levels of voluntary compliance, yet these taxes are relatively inelastic compared to corporate taxes (H_5). Revenues from income taxes are found to have an expected significant negative correlation with non-democratic regimes suggesting that without a quasi-contractual agreement in place, it is much more difficult for regimes to extract revenues from this lucrative base which is not the case with corporate taxes. Because the dependent variables in this system of equations are compositional, the relatively lower proportion of income tax revenues collected in non-democratic regimes is compensated with relatively higher non-tax revenues which strongly correlated with crude petroleum extraction. These results provide some support for H_1 where non-democratic regimes are expected to put less emphasis on tax revenues relative to democratic regimes. While these studies both conclude that political regimes *do* have a significant effect on revenue compositions, there still remains "the critical question of what explains these tax

patterns.” (Timmons 2010)

Some empirical insight into the mechanism through which democratic regimes are able to better extract higher proportions of revenues from large and voluntary bases is provided by Feld and Frey (2002) who find convincing evidence from tax authority survey data for 26 Swiss cantons over the 1970-1995 period that taxpayers respond systematically to how they are treated by the authorities through two avenues: *i*) deterrence, which is a unilateral act of the state and does not require the formation and commitment to a quasi-contractual agreement with taxpayers, and *ii*) tax morale, which does require such a commitment to ensure taxpayers feel they have a voice in the formation of fiscal policy. They also find empirical support for the “crowding out” hypothesis where the use of deterrence crowds out tax morale, diminishing the positive marginal effect on compliance. These findings, along with other studies of Swiss cantons (Pommerehne and Frey 1992; Pommerehne and Weck-Hannemann 1996), suggest that tax avoidance tends to be lower under more trustworthy and democratic regimes. Moving to a between country analysis, Slemrod (2002) finds evidence of a significant partial correlation between taxpayer’s willingness to cheat on taxes and trust in government using World Values Survey data for a cross section of twenty-five states, and; Hellman and Kaufmann find evidence using survey data for 6500 firms across twenty-seven transitional countries, suggesting that tax compliance has a significant negative association with what they call the “crony bias” characterized as the inequality of influence. On the premise that tax compliance becomes a much broader measure of confidence in state institutions, they conclude that tax compliance should be more prevalent under democratic regimes (Hellman and Kaufmann 2002).

2.4 The Data

Dependent Variables

The IMF Government Finance Statistics Yearbook (*GFSY*) identifies total revenues as the sum of four broad components of central government revenues: Taxes, Social contributions, Grants, and, Other revenue. Tax revenues are defined as the sum of *i*) Income, profits and capital gains, *ii*) Taxes on payroll and workforce, *iii*) Taxes on property, *iv*) Taxes on goods and services, and *v*) Taxes on international trade and transactions. I disaggregated the first component into capital and income tax revenues and measure all categories as a percentage of total revenue. Summary statistics for all dependent variables are given below in Table 1 which gives an idea of the substantial variation that exists within each source of central government revenue. With respect to social contributions, these are defined as actual or imputed receipts either from

employers on behalf of their employees or from employees, self employed, or non-employed contributors, their dependents, or their survivors. (IMF Government Finance Statistics Manual (*GFSM 2001*) These contributions may be compulsory or voluntary and are levied as a function of earnings, payroll, or the number of employees therefore can be seen, much like income tax, as a type of voluntary tax on income. Size is measured as total government revenue as a percentage of GDP using total revenue data from *GFSY* and GDP data from IMF's International Finance Statistics (*IFS*).

Independent Variables

In order to test for any effect of political regimes on revenue compositions requires a consideration of economic and administrative constraints. Energy production creates an alternative to taxation for governments who nationalize these lucrative sources of financing the state and should therefore influence the tax requirements. These are defined by the International Energy Organization (*IEA*) as crude oil, natural gas liquids, and oil from non-conventional sources, natural gas, solid fuels coal, lignite, and other derived fuels, combustible renewables, waste, and primary electricity, all converted into oil equivalents.³⁷ With respect to base effects, data on labour force size and composition (employment in agriculture (as % of total labour force), female participation rates (as % of total labour force) and GDP per capita) were taken from World Bank World Development Indicators (*WDI*). Administrative costs are proxied with gross secondary school enrollment rates³⁸ and demographic characteristics (distribution of the population by age group, rural/urban split, population density) are also taken from *WDI*. Although these measures of administrative costs are less than perfect, there currently exists a scarcity of data which directly reflects these costs for a global sample of countries. The results from these proxies should therefore be interpreted as such. Democracy is measured using the sum of Freedom House political rights and civil liberties scores which I invert such that a score of zero indicates a fully non-democratic regime and a score of six indicates a fully democratic regime. Data on regime durability was obtained from the Polity IV database and is computed as the number of years a regime has existed without a three point or greater change in their Polity score. (Polity 2009). War is computed as a countries average score from international, ethnic and civil wars using data from Major Episodes of Political Violence database.³⁹ I proxy for the likelihood of revolution to test the Acemoglu and Robinson hypothesis with the number of riots that took place in each state using data from Banks Cross National. Time Series database (2009). With respect to exogenous non-tax revenues, grants are defined as non-compulsory current or capital transfers received by a government unit from either another government unit

³⁷<http://www.iea.org/stats/index.asp>

³⁸(as ratio of total enrollment, regardless of age, to the population of the age group that officially corresponds to the level of education shown)

³⁹<http://systemicpeace.org/warlist.htm>

or an international organization (*GFSM 2001*). Other revenue can be broken down into sub-categories of *i*) property income , *ii*) sales of goods and services, *iii*) fines, penalties, and forfeits, *iv*) voluntary transfers other than grants, and *v*) miscellaneous and unidentified revenue. Of these, the first two make up the majority (78%) of revenue from other sources, much of this coming from natural resource extraction. I also include a federalism dummy variable to control for the fact that sub-national government may collect significant levels of revenues in these states. Because the data is for consolidated central government revenues, this should be considered as a control variable where countries with a greater degree of decentralization (which is highly correlated with federalism) should be expected to generate relatively lower total revenues due to the confines of the data. ⁴⁰ Summary statistics are provided below.

⁴⁰Source: Forum of Federations: http://www.forumfed.org/en/federalism/by_country/index.php

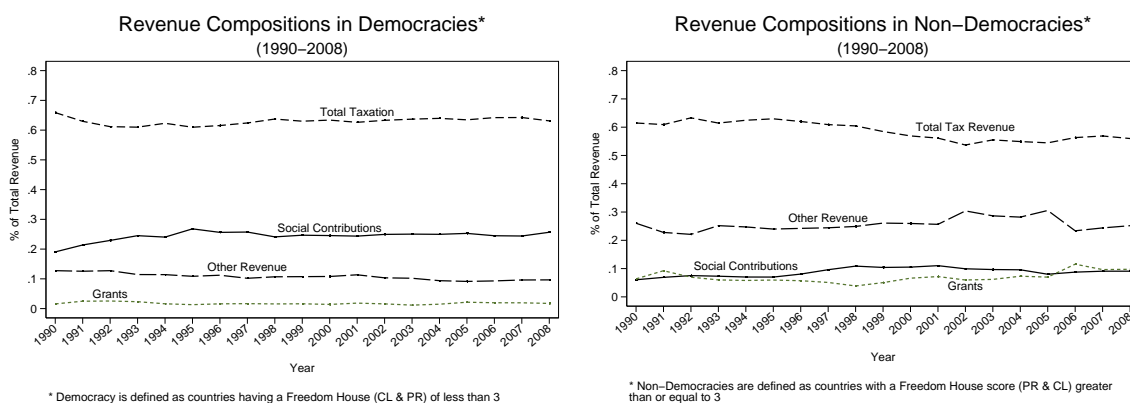
Table 2: Summary Statistics

Variables	MEAN (s.d.)	MIN	MAX	SOURCE
SIZE (% GDP) & REVENUE COMPOSITIONS (% TOTAL REVENUE)				
Size (% GDP)	27.91 (9.63)	4.58	58.71	<i>IMF-GFS/ IMF-IFS</i>
Income Tax	11.90 (11.33)	0	50.63	<i>IMF-GFS</i>
Corporate Tax	9.65 (8.03)	0	63.94	<i>IMF-GFS</i>
Unallocated between Income and Corporate Payroll Tax	0.93 (3.34)	0	37.00	<i>IMF-GFS</i>
Property Tax	0.77 (1.82)	0	19.05	<i>IMF-GFS</i>
Property Tax	1.47 (1.96)	0	18.45	<i>IMF-GFS</i>
Taxes on Good and Services	29.05 (11.53)	0	62.80	<i>IMF-GFS</i>
Other Tax	1.26 (2.35)	0	25.00	<i>IMF-GFS</i>
Social Contributions	17.74 (15.08)	0	60.22	<i>IMF-GFS</i>
INDEPENDENT VARIABLES				
Federal	0.18	0	1	
War	0.12 (0.40)	0	3.33	
Riots	0.30 (1.09)	0	15	<i>CNTS</i>
Durability	28.50 (35.57)	1	199	<i>Polity IV</i>
Democracy	3.98 (1.86)	0	6	<i>Freedom House (PR & CL)</i>
Urban	61.12 (21.51)	5.4	100	<i>WB-WDI</i>
Employment in Agriculture	16.78 (16.62)	0	82	<i>WB-WDI</i>
Population 65+	8.78 (5.06)	1.00	21.41	<i>WB-WDI</i>
Population Density	201.71 (612.86)	1.43	6943.19	<i>WB-WDI</i>
Female Labour Force	39.92 (8.63)	9.82	53.14	<i>WB-WDI</i>
Energy Production per capita	0.35 (0.89)	0	6.47	<i>IEA</i>
Secondary School Enrolment (Gross)	81.83 (27.93)	4.80	161.78	<i>WB-WDI</i>
GDP per capita	8,831.80 (10,723.66)	107.03	56,624.7 3	<i>WB-WDI</i>

Because revenue compositions have received little attention in the literature, the remainder of this section will provide a more in depth overview of observed revenue compositions from a sample of ninety states over the 1990-2008 period, with a brief discussion of each component that makes up the tax, and non-tax, mix.

Total Revenues Figure 1 shows the unconditional revenue compositions between a simplified dichotomous grouping of democracies and non-democracies (based on Freedom House data) for the 1990-2008 period to gain a first insight into potential differences in revenue extraction across this broadly defined institutional context. Democratic and non-democratic governments appear to collect, on average, a similar proportion of total revenue in the form of taxation with democracies collecting 63.1% and non democracies collecting 58.9%. Major differences appear in the collection of social contributions where democracies collect, on average, almost three times more revenue from contributions (24.5%) relative to non-democracies (8.67%). The significantly lower proportions of total revenue generated by social contributions in non-democracies are counterbalanced by higher proportions of revenue from other (non-tax) revenue sources, which are primarily made up of property income and the sale of goods and services. Revenue from grants also differ substantially across regime type with democracies collecting, on average, 1.75% and non-democracies collecting 6.76%. A great deal of these differences (especially in the case of revenue from grants) are likely to be explained away by economic and administrative circumstances, where, for example, GDP per capita in democratic states averaged \$13,972⁴¹ in democracies and only \$3,045.40⁴² in non-democracies.

Figure 15: Revenue Compositions and Regime Type



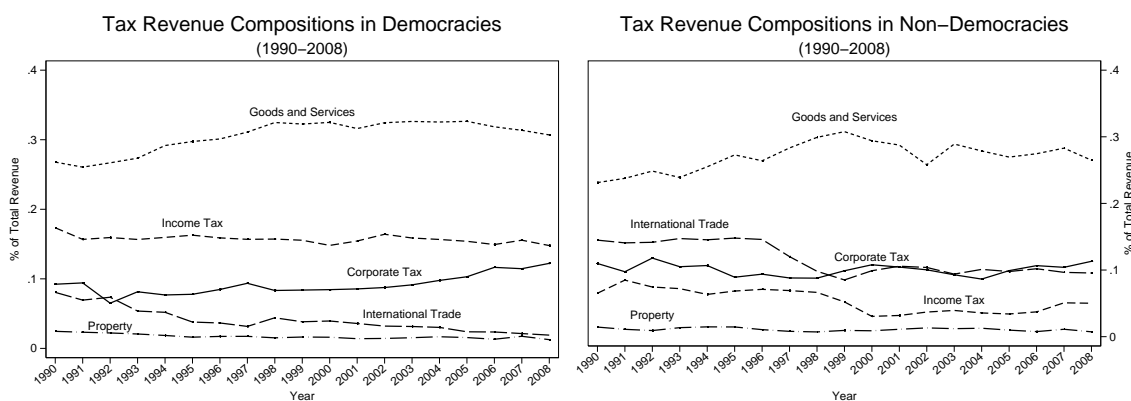
⁴¹in constant 1990 US dollars

⁴²Ibid

While Figure 1 suggests that total tax revenue appear to be relatively similar across regime types, the composition of tax revenues tells a different story. Figure 2 breaks down tax revenues into five broad categories of: *i*) taxes on goods and services, *ii*) taxes on individual income, *iii*) taxes on corporate income, *iv*) taxes on international trade and transactions, and *v*) taxes on property. Non-democracies collect, on average, 11.8% of their total revenue from taxes on international trade and transactions while democracies collect a significantly smaller proportion, on average, of 3.9% of total revenue. As was the case with proportional revenue from grants, this difference is likely to be highly influenced by the differences in economic and administrative circumstances mentioned above, as developing states tend to be more reliant on this easy to administer tax base. Revenues from property taxes appear to make up a relatively small proportion of total revenues in both regime types with democracies and non-democracies collecting, on average, 1.6% and 1.1% of their total revenue from this base. With respect to goods and services, both regime types are highly reliant on this large and relatively inelastic base with democracies generating, on average, 30.7% of their total revenue and non-democracies generating, on average, 26.9% .

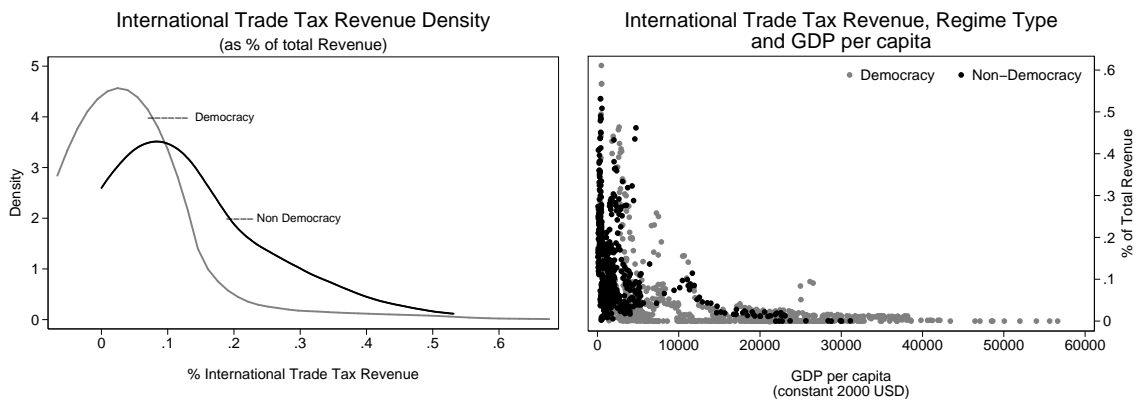
The two remaining tax bases, corporate and income tax, make up the largest progressive instruments in the tax mix. Although past empirical work has combined these into a single 'progressive' tax element (Timmons 2010), the preliminary evidence suggests that, while corporate taxes do not appear to significantly differ between regime type (9.2% and 10% of total revenue in democracies and non-democracies respectively), income taxes make up almost triple the proportion of total revenue in democracies (15.7% on average compared to non-democracies 5.5% on average). Again, it should be noted that significant differences in economic circumstances will also influence policymakers ability to collect revenues from these bases which will be controlled for below.

Figure 16: Tax Compositions and Regime Type



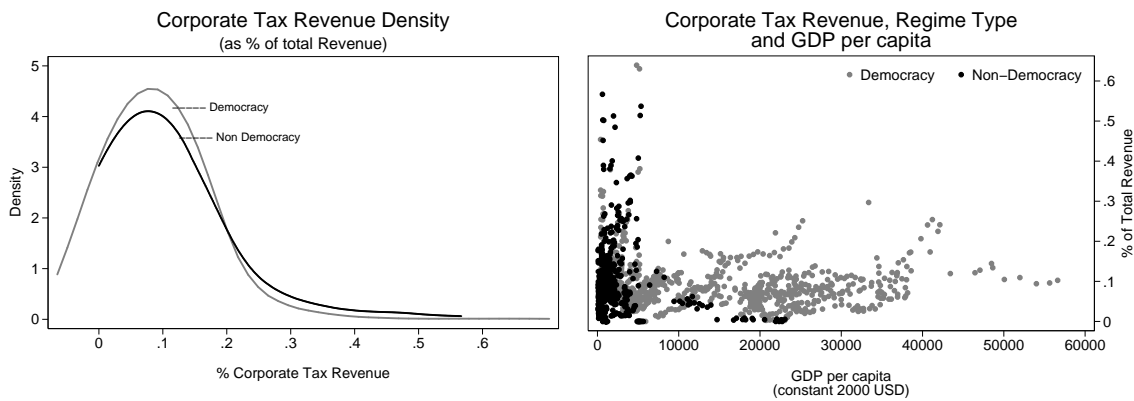
Taxes on International Trade and Transactions The fact that taxes on international trade and transactions can be collected on a narrow band of the economy with low administration costs makes it appealing for developing nations with low levels of administrative technology (Stotsky and WoldeMariam 1997; Fauvelle-Aymar 1999; Baunsgaard and Keen 2005). Revenues from this base, however, receive less emphasis as economies develop and decrease distortions in trade flows by signing into mutually beneficial free trade agreements. As can be seen in the first graph of Figure 3, the frequency distribution of revenue from this base is highly concentrated around zero for both regime types with a handful of small and low income countries (Azerbaijan, Cote D'Ivoire, Lesotho, Vanuatu) generating over 50% of their revenues from taxes on international trade. Given the low degree of voluntary compliance necessary to administer this tax, we should also expect both types of regimes to make equal use of it as they develop (*ceteris paribus*). Preliminary evidence in the second graph of Figure 3 suggests that, once we control for differences in GDP per capita, there do not appear to be any significant differences between the two regime types with developing democracies and non-democracies making relatively greater uses of this base.

Figure 17: Revenue from Taxes on International Trade and Transaction



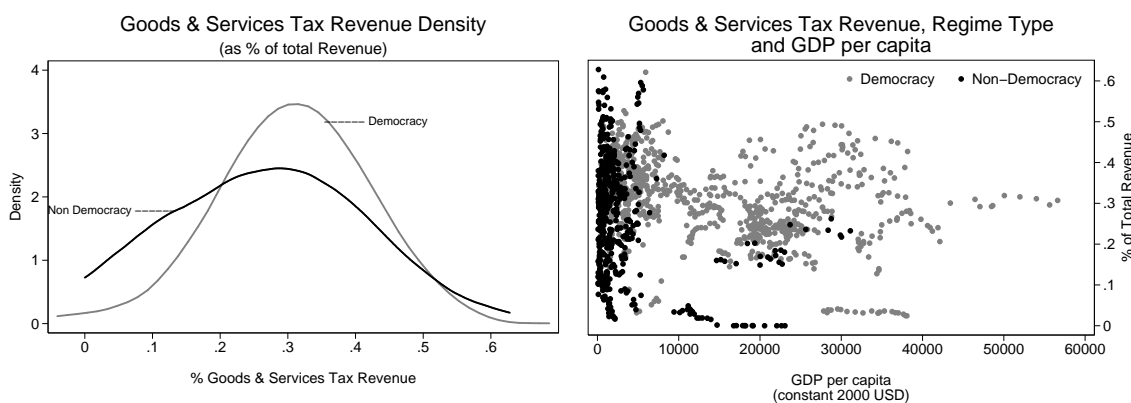
Taxes on Corporate Income Although corporate and individual taxes on income form the two most prevalent instruments of progressivity in the tax arsenal, they exhibit much different patterns of cross-national heterogeneity. As was noted above, corporate taxes are imposed on a much smaller base making them easier to impose for countries seeking some form of fiscal redistributive justice yet lacking the administrative or political infrastructure to imposed large scale income taxes. (Musgrave 1969, Winer and Kenny 2006) For example the ideologically ‘left’ regimes in Venezuela and Kazakhstan have generated as much as 64% and 52%, respectively, of their total revenue from this base over the 1990-2008 period. From an OT perspective, corporate taxes also have greater implications for the future wealth of the nation given their relative elasticity compared to taxes on income (labour). Fueled by tax competition in increasingly globalized markets, revenue from capital taxation becomes more economically sensitive and distortionary in the private market making income taxes more attractive for both government as well as the median voter. We should therefore expect that cost minimizing governments who have access to both income as well as capital taxation to put greater emphasis on the relatively inelastic income tax. To the extent that it is politically motivated at all, the relationship between corporate tax revenue and politics is likely to be more correlated with ideology than regime type. Figure 4 suggests there does not appear to be any preliminary evidence of any systematic patterns between regime type and corporate tax revenues once we control for GDP per capita.

Figure 18: Corporate Tax Revenues



Taxes on Goods and Services Due to the relative ease of administration and political neutrality, broad based taxes such as the taxation of goods and service are seen to be less distortionary (relatively inelastic) and horizontally more equitable than narrow based taxes. (Harberger 1964; Alt 1996; Timmons 2010) Taxpayer resistance is also generally lower when taxes are imposed indirectly on broad bases and administration of this tax do not require high degrees of voluntary compliance. This is especially true where this tax is imposed on the supplier as is the case of the increasingly popular VAT. Political neutrality suggest that political institutions should only have a significant impact on this base where H_{3b} holds and new taxes are distributed horizontally across newly enfranchised taxpayers. Looking at Figure 5, if we exclude the small cluster of countries which derive a large proportion of their revenue from natural resources (Bahrain, Bhutan, Iran, Kuwait), there appears to be no systematic relationship between regime type and revenues from goods and services once we control for GDP per capita.

Figure 19: Revenue from Taxes on Goods and Services



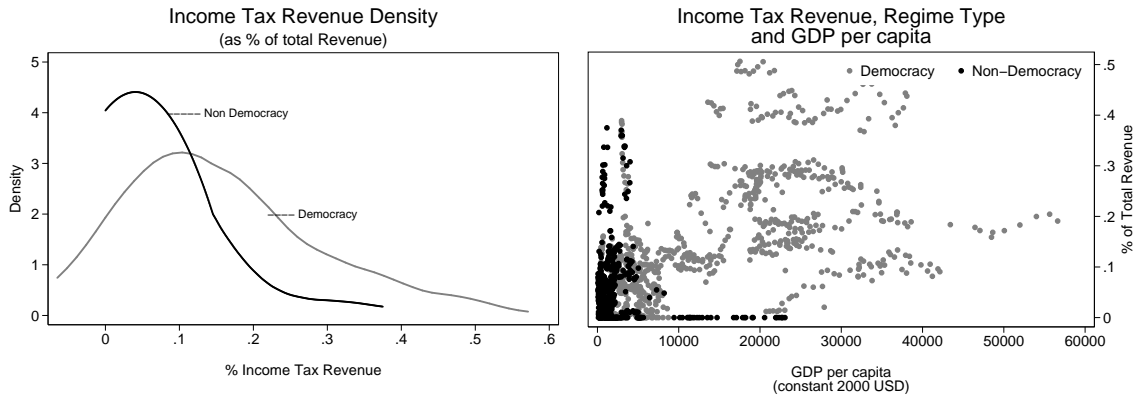
Taxes on Individual Income Existing work on the importance of tax compliance in democratic states leads to the hypothesis that democratic governments will be better able to extract revenue from voluntary and difficult to administer revenue sources than non-democracies since trust in the regime is considered to be higher under these regimes (Alt 1996; Fauvelle-Aymar 1999; Feld and Frey 2002; Slemrod 2002). One of the most prevalent findings in the only other existing study of revenue compositions across regime type is that democratic regimes tend to put a larger emphasis on income tax reflecting the benefits of voluntary compliance that exist in systems which allow political participation and competition. (Kenny and Winer 2006) This finding also supports Levi’s quasi-contractual agreement where taxpayers gain the ability to influence/constrain public policy and the dispersion of public funds in exchange for the tax revenue necessary to finance it. (Levi 1988; North and Weingast 1989; Ross 2004). Aidt (2009) also finds strong evidence from a historical sample of states supporting the extension of voting franchise in western nations as a major determinant of the probability of adopting an income tax.

Figure 6 gives some preliminary evidence supporting the existence of systematic differences across regime type after controlling for GDP per capita. Non democracies appear to make less use of the income tax base, especially where GDP per capita is above \$10,000⁴³, or have no need to make use of this politically/administratively costly base. Although revenues from income taxes were relatively insignificant upon their adoption (see Aidt 2009), considerable inertia has facilitated their growth to the extent that income tax revenues currently makeup over forty percent of total central government revenue in long lived democracies such as Canada, the US and Australia giving some support for H_{3a} and H_4 . Winer *et al* note that “in the

⁴³GDP per capita is measure in constant 2000 USD

mature, democratic societies...political competition over the decades would surely have led to the abolition of withholding if this practice did not have the widespread and continuing support of the majority of the electorate”, which leads to the presumption that, in democratic states, the observed income tax outcomes are the equilibrium outcome of tax bargaining between taxpayers and government over time. (Winer and Kenny 2006, Winer, Kenny & Hettich 2009).

Figure 20: Income Tax Revenues



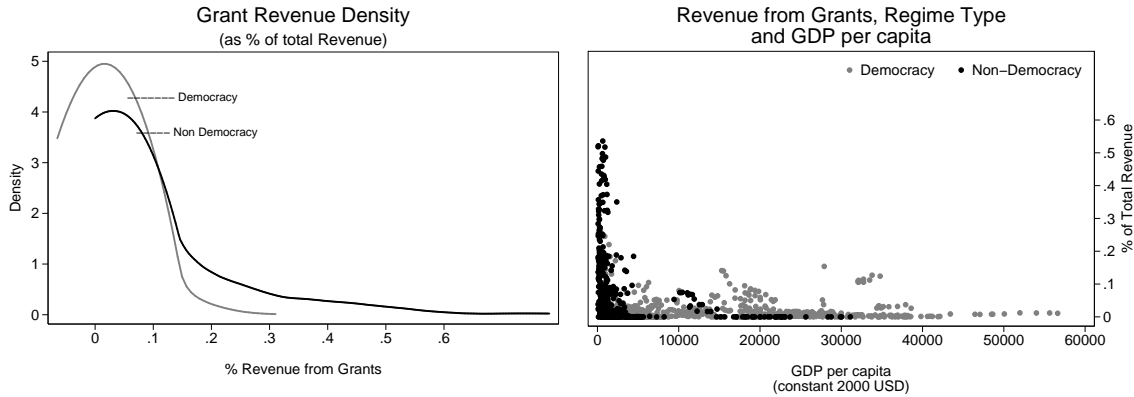
Non-Tax Revenue

Because non-tax revenues are exogenously set outside of the confines of policymakers, these are important in deciding how much tax revenue is necessary to finance government. As was discussed in section __, where non-tax revenue fully satisfies government financing needs, all tax rates will be set to zero, and, in the intermediate case where non-tax revenues are greater than zero but less than government financing requirements, the tax mix will tend to favour less costly bases. This suggests that the proportion of non-tax revenue (as a percentage of total revenue) will play an important role in determining the tax mix.

Grants Revenue from grants exhibits similar characteristics to those from international trade as they are mostly confined to developing or transitional nations such as Afghanistan (70% and 78% of total revenue in 2006 and 2007, respectively) and the Democratic Republic of the Congo (52% in both 1996 and 2001) Given that revenue from this source are transfers from either another government unit or international organization, their extraction also falls outside the scope of policymakers discretionary budgeting powers and should therefore not be expected to be influenced by internal political structures such as regime type. As was the case with revenue from trade taxes, Figure 7 shows that the majority of countries generated insignificant proportions of revenue from grants with a small number of transitional economies relying on this

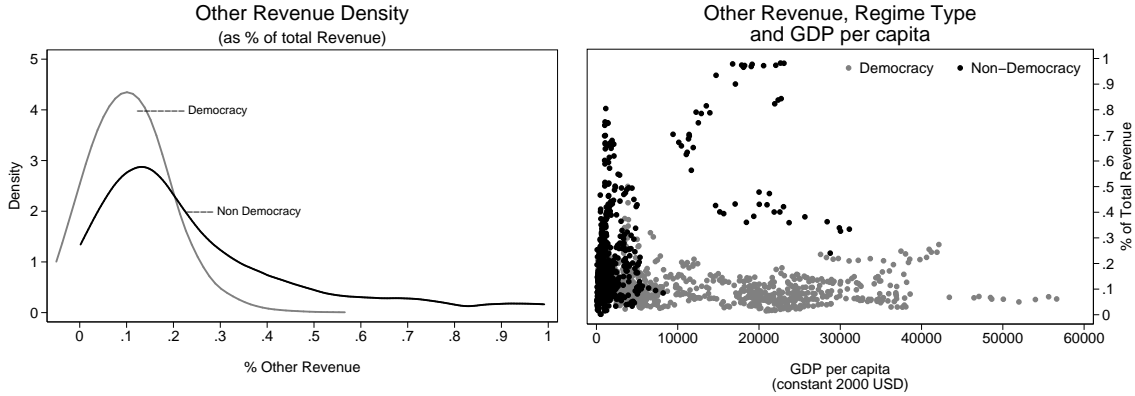
base to finance a significant proportion of their total revenues. Once we control for GDP per capita, there does not appear to be any evidence that political system influence grant revenues.

Figure 21: Revenue from Grants



Other Revenue A lower reliance on voluntary tax bases (social security and income) in non-democracies can be compensated by an alternative sources for government fortunate enough to be endowed with exogenous sources of revenue. The relationship between revenue compositions and regime type will inevitably be influenced by the extent to which governments can finance their expenditures through non-tax sources. It should be expected that governments who do not require additional revenues from direct tax bases will not need to enter into quasi-contractual agreements with those whom they govern. Significantly higher revenues from non-tax sources (H_1) should therefore allow government to maintain unilateral policy-making power without the threat of taxpayer revolt as these taxpayers will not be subject to politically costly direct taxation. Likewise, governments who can only finance a small proportion of their total revenues will be required to engage in fiscal exchange with the taxpaying population in order to satisfy their budget constraint through the use of more difficult to administer direct tax bases. Figure 8 gives strong preliminary evidence that non-democratic states have significantly greater access to non tax revenues, where countries like Bahrain, Republic of the Congo, Iran, United Arab Emirates, and Myanmar, are able to finance over half (and in some cases, all) of their total revenues.

Figure 22: Other Revenues



2.5 Estimation

Systems of budget equations for revenue compositions (with total revenue as the denominator: $R_i = r_i / \sum r_i$; where r_i is central government revenue from source i), have taken on the general form:

$$\begin{cases} \phi(R_1) = \alpha_1 \mathbf{B} + \beta_1 \mathbf{A} + \gamma_1 \mathbf{P} + \varepsilon_1 \\ \phi(R_2) = \alpha_2 \mathbf{B} + \beta_2 \mathbf{A} + \gamma_2 \mathbf{P} + \varepsilon_2 \\ \dots\dots\dots \dots \\ \phi(R_k) = \alpha_k \mathbf{B} + \beta_k \mathbf{A} + \gamma_k \mathbf{P} + \varepsilon_k \end{cases} \quad (9)$$

Because this system of equations is constrained to the unit simplex ($\sum_i R_i = 1$; ($0 \leq R_i \leq 1$)) it should be estimated accounting for the compositional nature of the data (Pearson 1897; Aitchison 1986; Katz and King 1999) which has been achieved in two ways. The first, which was used by both Winer and Kenny (2006) as well as Aidt and Jensen (2009) in past work on systems of budget equations, specifies this system using untransformed proportions $\phi(R_i) = R_i$; ($i = 1, \dots, K$) in a seemingly unrelated regression of observed budget shares on a set of economic, political and administrative covariates. By summing the parameter estimates across equations for specific countries and years they verify *ad hoc* that the right hand side is also constrained the unit simplex, however, “...even when point predictions happen to fall within the constraints of the simplex, the full probabilistic implications are virtually always logically impossible, as some of the predictive densities always falls outside the simplex.” (Katz and King 1999). This method also lead to an uninterpretable covariance structure and spurious

correlations given the unit sum constraint. (Pearson 1897; Aitchison 1986; Fry, Fry and McLaren 1995) The second approach takes explicit account of this constraint transforming the data from the unit simplex \mathcal{L} into real space \mathbb{R} applying a log-ratio transformation:

$$\phi(R_i) = \log(R_i/R_K); \quad (i = 1, \dots, (K - 1))$$

with Jacobian

$$jac(\phi(\mathbf{R})|\mathbf{R}) = (R_1, \dots, R_K)^{-1}$$

to approximate the multivariate normal distribution with mean μ and log-ratio covariance matrix Σ with elements $\sigma_{ij} = cov\{\log(R_i/R_K), \log(R_j/R_K)\}$. (Aitchison 1986).

This transformation causes obvious problems for observed zero's. In the sample of ninety countries over the 1990-2008 period, 13% of observed income tax, 4% of corporate tax, 63% of payroll and social contributions tax, 27% of property tax, 15% of taxes on international trade and transactions, 59% of allocatable tax revenues between corporate and income, 0.7% of taxes on goods and services, and, 15% of social security contributions were essential zeros. Although no consensual solution has yet emerged to the essential zero problem, there exists a niche of literature suggesting a range of potential solutions. (Aitchison 1986; Aitchison and Kay 2003; Fry and Chong 2005) Rather than imputing the remaining zeros, I use the simple 'modified Aitchison' approach suggested by Fry and Chong (2006) which preserves the share ratio's for the non-zero components by replacing essential zeros with:

$$\tau_A = \delta(M + 1)(N - M)/N^2$$

and reducing non-zeros by:

$$\tau_s = \omega_i \delta M(M + 1)/N^2$$

Where M is the number of zeros in the composition leaving $M - N$ non-zero components, δ is the maximum rounding error and ω_i is a weighting parameter for non-zero tax instrument i .

Transforming revenue shares into log-ratios, the system of $K - 1$ equations can be efficiently estimated with a seemingly unrelated regression approach using Feasible Generalized Least Squares or Maximum Likelihood which have been shown to perform equally well. (Zellner 1962; Katz and King 1999; Tomz et al. 2002). To obtain interpretable predictions for revenue compositions, the right hand side of (9) can be transformed with the inverse logistic

transformation:

$$\hat{R}_i = \frac{\exp(\alpha_i \mathbf{B} + \beta_i \mathbf{A} + \gamma_i \mathbf{P} + \mu_i NTR)}{1 + \sum_{i=1}^{k-1} \exp(\alpha_i \mathbf{B} + \beta_i \mathbf{A} + \gamma_i \mathbf{P} + \mu_i NTR)} \quad \text{for } i = 1, \dots, (k-1) \quad (10)$$

and,

$$\hat{R}_k = \frac{1}{1 + \sum_{i=1}^{k-1} \exp(\alpha_i \mathbf{B} + \beta_i \mathbf{A} + \gamma_i \mathbf{P} + \mu_i NTR)} \quad (11)$$

I also test the Leviathan hypothesis regressing total size of government (revenue to GDP) on the same set of right hand side variables:

$$\sum_i R_i / GDP = \alpha_i \mathbf{B} + \beta_i \mathbf{A} + \gamma_i \mathbf{P} + \mu_i NTR \quad (12)$$

Comparable large scale public finance data has only recently become available and only exists for short periods of time making within-country inference difficult. Given the small amount of within country variance in revenue compositions over the 1990-2008 period, the slow moving nature of political institutions and the potential existence of distortionary budget cycles, I average the data over five periods capturing these with dummy variables. An additional difficulty in a globally representative sample of countries is the amount of missing data. Within the *IMF-GFSY*, there are ninety countries with a population greater than 500,000 who have between three and eighteen fully observed revenue compositions for the 1990-2008 period. The proportion of missing data for the left hand side of the system of equations (revenue proportions) is about 27%. Past research has dealt with the missing data problem by either averaging observed data over specified time intervals (Winer and Kenny 2006) or list-wise deletion (Timmons 2010). The stringent Missing Completely at Random (MCAR) assumption required for list-wise deletion is unlikely to be met by public finance data and ignores a great deal of potentially useful information, leaving the second option of imputing the missing data. (Honaker and King 2010) Moving to the less stringent Missing at Random (MAR) assumption comes at the cost, however, of replacing unobserved values with parametric estimates. In the analysis below I take into account the uncertainty in estimation of these values as well as sampling uncertainty by imputing five datasets and running 1000 Monte Carlo simulations of the parameter estimates in the budget shares equation (9).⁴⁴

2.6 Results

Log-ratio parameter estimates for the specification in (8) and (11) are given in Table 3.

⁴⁴Public finance data was imputed with leads and lags as well as Ridge priors using Amelia II (Blackwell,

Table 3: Log-Ratio Estimates for Revenue Compositions (standard errors in parenthesis)

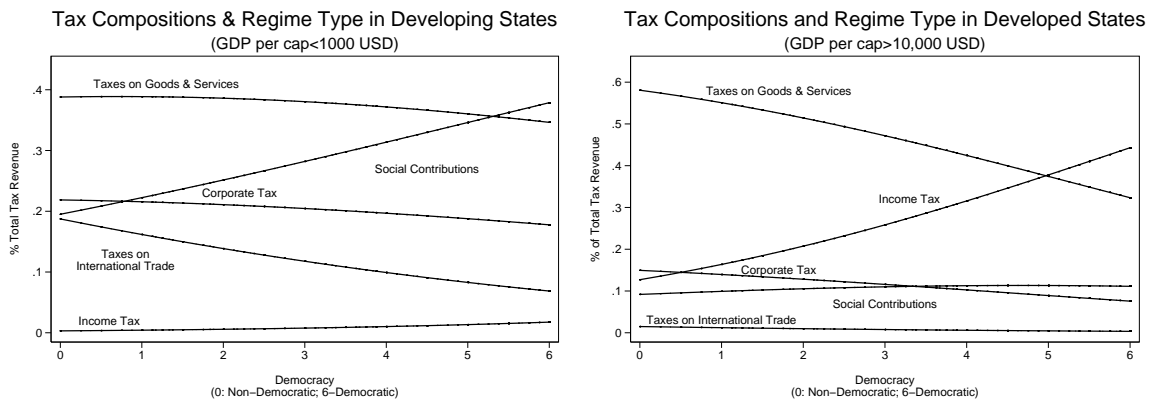
Variables	SIZE	TAX REVENUE					SOCIAL CONTRIBUTIONS
	Total Revenue (% GDP)	Corporate	Income	Payroll	Property	International Trade	Social Contributions
Federal	-6.35*** (0.84)	-0.54** (0.24)	-0.92** (0.36)	0.17 (0.43)	-0.99*** (0.37)	0.34 (0.32)	-0.55 (0.33)
War	0.97 (1.07)	0.18 (0.30)	0.67 (0.46)	0.64 (0.55)	-0.07 (0.47)	-0.07 (0.43)	-0.46 (0.44)
Riots	0.21 (0.39)	0.01 (0.11)	-0.03 (0.18)	-0.33 (0.21)	0.23 (0.18)	-0.32** (0.16)	-0.13 (0.16)
Employment Agriculture	-0.08* (0.04)	-0.02* (0.01)	-0.01 (0.02)	-0.07*** (0.02)	-0.06*** (0.02)	-0.01 (0.02)	-0.06*** (0.02)
Energy Prod	0.90*** (0.30)	0.04 (0.07)	0.05 (0.09)	-0.02 (0.11)	-0.12 (0.10)	0.05 (0.09)	-0.02 (0.08)
Population 65+	0.61*** (0.12)	-0.12*** (0.01)	0.02 (0.05)	-0.25*** (0.07)	-0.23*** (0.05)	-0.35*** (0.05)	0.19*** (0.05)
Labour Force Female (%)	-0.03 (0.05)	0.02 (0.02)	-0.05** (0.03)	0.08** (0.03)	-0.07*** (0.03)	0.09*** (0.02)	0.05* (0.03)
Trade (% GDP)	0.01 (0.01)	-0.002 (0.002)	-0.02*** (0.004)	-0.01** (0.005)	-0.01** (0.003)	0.0003 (0.003)	-0.01** (0.003)
GDP per capita (ln)	1.17** (0.55)	-0.30* (0.17)	1.27*** (0.25)	0.14 (0.30)	0.56** (0.26)	-1.13*** (0.23)	-0.45* (0.24)
Population Density (ln)	0.02 (0.26)	0.28*** (0.08)	0.17 (0.14)	0.58*** (0.15)	0.58*** (0.12)	0.13 (0.10)	0.14 (0.11)
Democracy (FH)	-0.38 (1.02)	-0.02 (0.08)	0.31** (0.13)	-0.30* (0.15)	0.23* (0.13)	-0.15 (0.11)	0.13 (0.13)
Durability	-0.03*** (0.01)	0.01*** (0.003)	0.01** (0.004)	-0.02*** (0.005)	0.01*** (0.005)	0.02*** (0.004)	0.004 (0.004)
Urban (%)	-0.04 (0.03)	-0.001 (0.01)	-0.07*** (0.01)	0.02 (0.02)	-0.01 (0.01)	0.04*** (0.01)	0.01 (0.01)
Secondary School	-0.04 (0.05)	0.03 (0.02)	-0.10** (0.03)	-0.01 (0.03)	-0.02 (0.03)	0.05* (0.03)	0.11*** (0.02)
Secondary School Sq.	0.00*** (0.00)	-0.00 (0.00)	0.001** (0.0001)	0.001** (0.0001)	0.0001 (0.0001)	-0.0004*** (0.0001)	-0.0007*** (0.0001)
Grant Revenue		1.45 (1.77)	-6.03* (3.15)	7.63** (3.31)	7.91*** (2.90)	-6.75** (2.86)	-6.56** (2.88)
Other Revenue		2.00** (0.79)	-1.32 (1.19)	1.68 (1.55)	1.51 (1.29)	4.13*** (1.14)	1.66 (1.16)
Constant	17.86*** (5.48)	-2.13 (1.59)	-4.32* (2.48)	-8.59*** (2.29)	-3.56 (2.21)	0.63 (1.97)	-6.12*** (2.01)
Observations	450	450	450	450	450	450	450

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Beginning with the pure OT hypothesis, the assumption of benevolent government implies that fiscal behavior can be considered predetermined, efficient, and constant across states and time (*ceteris paribus*). If this assumption holds, we should be able to ignore political factors altogether, as the fiscal process is assumed to act algorithmically irrespective of whether those implementing it were voted into office or took it by force. From a statistical perspective, this would imply that there exists no systematic variation in revenue compositions across regime type, once all other deterministic factors are accounted for. Although unable to make any direct structural claims regarding the efficiency of tax structures, in reduced form there appears to be no evidence supporting the counter-factual hypothesis that political regimes do have an effect on the total *size* of government as can be seen from the insignificant positive effect of regime type in the first column of Table 3. Unsurprisingly this leads to a rejection of the revenue maximizing Leviathan hypothesis, confirming evidence from past empirical contributions.

Although no significant differences emerge in state size across regime type, there do appear to be systematic difference in the composition of revenues. Because these are highly influenced by economic factors ('base effect' - see Winer and Kenny 2006), the predicted revenue compositions are divided into categories of developing (GDP per capita less than \$1,000 constant USD) and developed states (GDP per capita greater than \$10,000 constant USD). Figure 23 shows predicted revenue compositions for these states across regime type as measured by Freedom House's Political Rights and Civil Liberties Index.

Figure 23: Predicted Tax Compositions and Regime Type



Honaker and King 2010)

The first graph in Figure 23 show predicted tax compositions for developing economies. These states appear to be highly reliant on regressive goods and services tax revenues with an increasing emphasis on social contributions for more democratic regimes. Because disposable income is extremely low within these states, income tax is an infeasible instrument for the redistribution of wealth, even where policymakers engage in quasi-contractual agreements with the populations they rule. Revenues from this base make up the smallest proportion of predicted revenues in developing states regardless of regime type. The lack of income tax revenues in developing states is partly compensated by larger shares of revenue from the other progressive option of corporate tax. These revenues, however, do not have any significant association with regime type as can be seen by the relatively flat curve in Figure 23, suggesting that regime type has no significant effect on the proportion of revenue from corporate taxes. Taxes on international trade also take on a much larger role in developing states as the tax technology required to administer this base is quite low making it appealing for those states who do not possess a highly efficient bureaucratic apparatus.

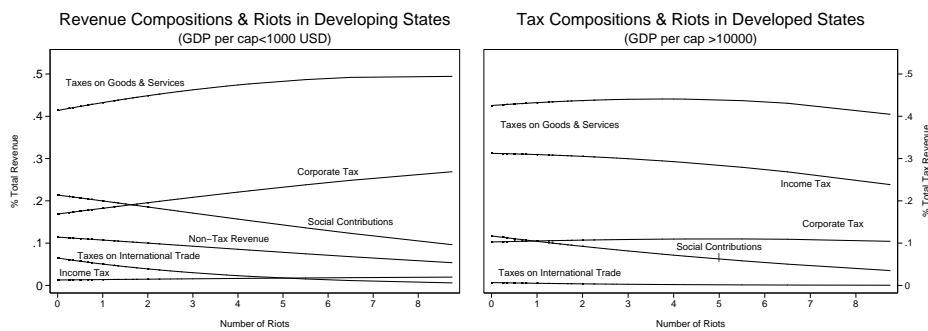
The second graph in Figure 23 show the predicted revenue compositions for developed states. Income taxes take on a much more prominent role in these states where larger levels of disposable income creates a sufficiently large base from which to extract significant proportions of revenue. The emphasis on income tax revenues increases substantially in more democratic states, providing support for the vertical fiscal exchange hypothesis (H_{3a}), where the median income earner imposes progressive taxes on relatively affluent taxpayers. Much less evidence is found supporting the direct fiscal exchange hypothesis (H_{3b}) as can be seen from the relatively flat curve on for goods and services in Figure 23. The discrepancy between these findings and those of Timmons (2010) is possibly explainable by the aggregation of progressive tax revenues (income and corporate), which has been shown in both Winer and Kenny (2006), as well as in this paper, to have significantly different relationships with levels of democracy.⁴⁵ To the same extent that developed democracies rely increasingly on income tax revenues, developed non-democracies rely to a great degree on easy to administer taxes on goods and services. This finding gives support for H_1 where we should expect unconstrained policymakers who are met with lower levels of loyalty to rely on non-voluntary sources of financing the state relative to quasi-contractually constrained policymakers.

The second Leviathan hypothesis is a test of the Acemoglu and Robinson theory that governments who face a threat of revolution will attempt to offset this threat by imposing redistributive taxes (H_2). The estimated effects of the riot variable are insignificantly correlated with the two

⁴⁵In order to validate this claim, a separate system of equations was run with individual and corporate income tax revenues as a single category in which democracy had no significant association with these revenues.

progressive tax bases (income tax and corporate tax) as neither of these are distinguishable from zero at conventional significance levels. Figure 24 below shows predicted revenue compositions across number of riots giving some evidence supporting H_2 with the threat of revolution proxied by the number of riots which took place in a given state.

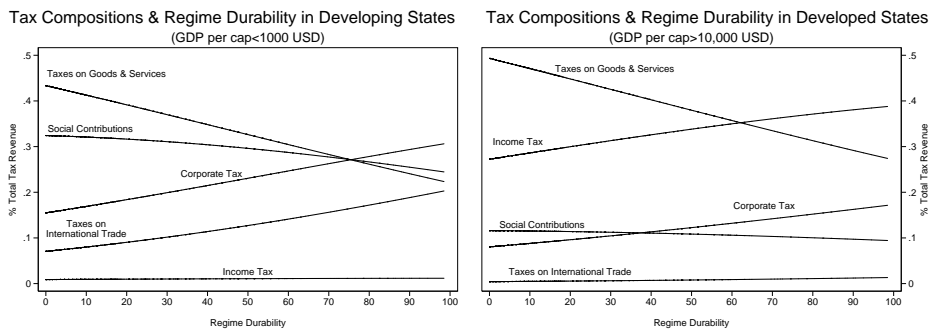
Figure 24: Predicted Tax Compositions and the Threat of Revolution



In developing states, the proportion of progressive corporate taxes increases as the threat of revolution increases; whereas, in developed states, the proportion of income taxes marginally decreases and corporate tax revenue marginally increases as the threat of revolution increases. The lack of robustness of these parameter estimates (see Figure 24) suggests that further research should be done with alternative proxies for the threat of revolution in order to confidently reject or fail to reject this hypothesis.

Based on the historical evidence in Section I, along with fiscal exchange theory, we would expect that regime longevity will increase the credibility of fiscal policy, allowing these governments access to more difficult to extract bases. Although alluding to an intrinsic public finance inertia which exists in durable regimes, Winer and Kenny (2006) do not explicitly incorporate regime longevity into their empirical analysis making these the first estimates of the relationship between regime longevity and revenue compositions. There is evidence that democratic regimes put significantly greater weight on redistributive taxes with developing democracies using increasingly larger proportions of corporate tax revenues and developed democracies favoring a combination of both corporate and income taxes. The marginal effects in Figure 25 are estimated independent of regime type, indicating that more durable regimes should be expected to make greater use of redistributive tax bases, relative to short lived regimes who have not built a relationship of trust with the taxpayer, regardless of whether they were voted into office or took it by force.

Figure 25: Predicted Tax Compositions and Regime Durability



The significant positive durability parameter estimates for both progressive tax bases (income and corporate) gives strong support for the informal fiscal exchange hypothesis (H_4), where more durable regimes who have accumulated greater levels of loyalty from the taxpaying population through the establishment of credibility are more likely to extract difficult to administer bases. These results also support the findings from the historical overview of income tax adoption in the UK and France, where a durable democracy in the UK had significantly greater success than the less durable democracy in France.

2.7 Discussion

Although these results provide new insight into the political economy of revenue compositions, there still remain several unresolved 'black box' issues for future research to uncover. Most pronounced is the inability to directly estimate compliance effects in large samples of states. The micro-level mechanism through which democratic governments are able to extract larger revenue shares from more difficult to administer tax bases still require robust direct testing. This is especially true in the case of unobservable 'tax moral' effects where past evidence has confirmed that such a relationship does exist, but data limitations, along with the difficulties that come with measuring tax compliance⁴⁶ itself, make it infeasible to incorporate these directly into large scale analysis. This paper estimates these effects indirectly through levels of democracy thereby makes the assumption that the select number of past findings which prove this relationship (trust and democracy) can be translated into a global sample of states. The findings can only be interpreted as correlations with the causal mechanisms of these empirical findings yet to be

⁴⁶Empirical studies of tax evasion were best characterized by the following quote, footnoted in Slemrod and Yitzhaki (2002): "Regression analysis of tax evasion is straightforward, except for two problems: you can't measure the left-hand side variable, and you can't measure the right-hand side variables." - H. Galper

confirmed in a large sample of states.

A second difficulty, from both theoretical as well as empirical perspectives, is the translation of an increase in the tax burden into political discontent, or the sensitivity parameter $(\partial g/\partial v)$ in (7). From a theoretical perspective, outside of the deterministic median voter world, there is no indication of how this parameter varies at a micro-level across taxpayers, and what causes it to do so. The empirical analysis above essentially assumes these to be uniform with two vote seeking parties converging on the median voter who prefers redistributive tax bases. If it is the case that these 'sensitivity parameters' vary systematically across taxpayers, further micro-level analysis (and data) is required before this heterogeneity can be fully understood and tested.

Lastly, the estimated durability effect could also be interpreted as a dynamic equilibrium produced by the revolutionary constraint. As was predicted in H_2 quelling this threat means that government will put greater emphasis on progressive tax instruments in order to redistribute income back to the dissatisfied masses. For any regime that survives to time $t + 1$, we should expect that they have appeased the masses in all previous periods $(t - j, ; j = 0 \dots N)$. It is therefore possible that the longevity of regimes is a product of these governments favoring progressive bases as well as having gained an administrative cost reduction from the unwritten fiscal contract (H_4). In order to fully unravel this durability effect requires long time series public finance data which is currently unavailable for large samples of states.⁴⁷

To sum up, while there do appear to be significant correlations between tax compositions and political regimes, the micro foundations or direct causal mechanisms require further theoretical and empirical analysis within a comprehensive Representation Theorem framework which incorporates the economic, administrative, and political contributions the policymakers tax decision. Tax compliance provides one potential mechanism through which the taxation for representation relationship is manifested suggesting that a relationship of trust between the taxpayer and government plays a significant role in both the administration, as well as political costs associated with revenue extraction. However, as mentioned in the data section, high quality measures which directly reflect both administrative costs and tax compliance are not currently available for a global sample of countries. This understudied area remains an important and interesting one for future research in the study of public finance.

⁴⁷The IMF Government Finance Statistics Division of the Statistics Department is currently working on rectifying this problem converting the historical 1986 GFSM cash flow data into 2001 GFSM format, allowing for comparable public finance data over the entire 1972-2009 period.

2.8 Conclusion

The decision of how to distribute the burden of financing the state is one that has received little attention in the political economy literature. The unprecedented growth of government in the second half of the 21st century makes it surprising that this decision has not been broken down compositionally and studied across private market and political actors who absorb them. The more commonly used method of aggregation masks a great deal of heterogeneity under the hood of the machine. Revenue structures appear to be the outcome of a multidimensional array of economic, administrative and political factors, all of which have a significant impact on policymakers ability to extract revenue from specific bases. From an economic perspective, although the pure OT (benevolent planner) framework has taken its rightful place as a normative benchmark, there does appear to be some evidence that policymakers who fully internalize the social cost of taxation do consider the elasticities (and cross elasticities) of supply and demand of each base, minimizing the consequences for actors in the private market. Political considerations add another dimension of complexity to these economic restraints as additional revenue demands can be met with revolutionary constraints or noncompliance. The creation of credibly binding fiscal contracts with taxpayers, formal or informal, costs government the freedom to unilaterally set fiscal policy, but provide the regime with higher levels of trust, compliance, and most importantly, tax revenue. Lastly, while administrative considerations impose well known structural constraints through base size and the level of tax technology possessed by policymakers, the role of compliance has recently become a new subject of interest as conventional models of deterrence systematically over estimated levels of non-compliance. Research in this area could provide greater insight into the causal mechanisms through which democratic governments gain access to higher levels of tax revenue as well as the historically despised and difficult to administer direct income taxes.

The goal of this paper was to provide some preliminary insight into a much neglected area in the political economy literature. Taking into account the unit simplex constraints that is intrinsic in compositional data, the findings from a large globally representative sample of states over the 1990-2008 period suggest that political regimes and regime durability *do* in fact have systematic partial correlations with revenue compositions; although the magnitude of these effects are highly dependent on other characteristics of the state (economic and administrative technology). Consistent with the expectations from Fiscal Exchange theory, democratic governments receive relatively larger tax revenue gains as they incorporate the masses into the fiscal policy making process. Decomposing these gains suggests that developed democratic governments will finance a large proportion of these tax increases with redistributive income taxes supporting the median voter hypothesis. Leviathan policymakers are, on the other hand, highly reliant on non-tax

revenues, and, to the extent that they do use tax instruments, are more highly reliant on small bases such as international trade and corporate taxes. There is some evidence that a revolutionary constraint may force all regime types to put greater emphasis on progressive tax instruments, yet these findings are not robust. Lastly, long lived regimes who establish a credible reputation over time are able to collect significantly higher proportions of revenue from progressive bases. This effect could be interpreted as *i)* the dynamic equilibrium created by the revolutionary constraint where government maintains power by having set redistributive taxes at a level which just appeases the poor, or; *ii)* the administrative gains from higher levels of compliance on difficult to administer bases as loyalty to the regime increases over time.

The above results confirm that political structure and policymaker objectives do significantly correlate with revenue compositions across regimes, yet a great deal of research into the micro foundations from both political and administrative perspective still need to take place before we can fully understand the causal mechanisms behind the results found in this paper. If it is dose that makes the poison in structures of public finance, we need to get a better idea of how the dose is compositionally distributed so as to not poison the taxpaying masses.

Part III

Deficits and Finite Planning Horizons

Abstract

Past research into the political economy of public finance has emphasized the need for government stability, or the concentration of budgeting power, to combat fiscal indiscipline. *Probabilistic* executive tenure, however, should also be expected to play a significant role in determining the degree to which policymakers internalize the future costs associated with their current fiscal behaviour. This paper is the first to empirically tests for within-country institutional effects of policymakers expected planning horizons on fiscal performance which have been difficult to model outside of a fixed term limit context due to the unobserved likelihood of remaining in office along with potential endogeneity problems. In a globally representative sample of sixty-one countries over the 1990-2006 period, the findings in this paper suggest that as the probability that an incumbent executive, in time t , will no longer be in power in $t + 1$ increases, so too does fiscal indiscipline characterized by the size of central government deficits as a percentage of GDP. Furthermore, there is no evidence of voter myopia along the dimension of fiscal outcomes. These findings raise interesting questions about how to rectify a fiscal problem which is directly associated with a fundamental feature of modern democratic systems.

4 Introduction

The widespread adoption of Keynesian macroeconomic ideology in the second half of the 20th century enhanced the theoretical grounding for greater discretionary fiscal powers of policymakers and politicians through the use of fiscal stimulus in times of economic stagnation. Subsequent increases in the use of deficit financing led to a persistent accumulation of public debt throughout the seventies into the late eighties, along with an increased academic interest in the cause of these imbalances. Within this time period, there also existed a large degree of cross-national variance in fiscal outcomes which were unexplainable by economic factors alone (i.e. tax smoothing), leading researchers to explore the role of fiscal institutions and behavior of policymakers. (Barro 1973; Roubini and Sachs 1989; Poterba 1996 Perotti and Kontopoulos 2002) Relaxing the neoclassical benevolent planner assumption, or the assumption of policymaker exogeneity, has opened up a wide array of theoretical and empirical research agendas over the past thirty years considering the preferences of, and constraints imposed on, policymakers in the creation of fiscal policy and their relationship with fiscal outcomes.

Several findings have emerged from this literature. Tsebellis's veto-players and Weingast

and Shepsle's application of the common pool resource problem have been argued to generate significant negative effects on fiscal outcomes through inefficiencies created in the budgeting process. (Weingast, Shepsle and Johnsen 1981; Roubini and Sachs 1989; Franceze 2005; Alesina et al 1999; Tsebellis and Chang 2004; Hallerberg et al. 2007; Wehner 2010) Theoretical applications have emphasized slow adjustment effects generated by large numbers of veto players, as well as suboptimal budget size and debt accumulation, from the common pool resource problem through the famous 'Law of $1/N$ '. There have also been a small number of theoretical and empirical contributions considering finite planning horizons of politicians, where exogenous or probabilistically limited tenure is expected to generate negative inter-temporal consequences for fiscal outcomes as political actors fail to fully internalize the costs of future burdens, or use them strategically against their successor. (Alesina and Tabellini 1989; Persson and Svensson 1989; Besley and Case 1995; Debrun and Kumar 2007) The potential endogeneity of expected tenure (governments pursue deficit spending to increase probability of re-election) has, however, made it difficult to estimate these discount rate effects on fiscal performance outside of a fixed term limit framework (i.e. US states – see Besley and Case 1995; Carey 1996)

This paper provides an empirical test for the effects of endogenous finite planning horizons (probabilistic tenure) using both an Endogenous Treatment Effects and Instrumental Variable approach which produce efficient estimates for the unobserved probability of the current government remaining in power at time $t + 1$. The findings provide support for Barro's tax smoothing theory, but little evidence of any direct fragmentation effects predicted by the common pool resources problem literature. There is some evidence that the number of parties in government, as well as ideological polarization of the executive, slows down the rate of policy adjustments with single party governments having the greatest ability to make large adjustments from one year to another as predicted by veto player theory. With respect to planning horizons, incumbent governments who know that will not be in office in the following period with a probability of one, are found to generate between 0.72% and 1.73% higher deficits (as a % of GDP). In short, executives with shorter expected time horizons are more likely to heavily discount a future where they will no longer be in power leading to inefficient fiscal outcomes. These results compliment the work of Debrun and Kumar (2007) who find that government stability has a significant effect on cyclically adjusted primary balances in a sample of eighteen EU countries over the 1990 – 2004 period. The significance of these findings raises questions about the propensity for policymakers to behave with fiscal irresponsibility as a result of the most fundamental aspect of democratic institutions: executive transitions.

Part I of this paper will provide a brief overview of the historical debate surrounding the economic relevance of fiscal policy, including the Neoclassical, Ricardian/neo Ricardian-Equivalence

and Keynesian paradigms. Part II will discuss the political factors which have been found to influence fiscal performance; mainly, fragmentation (from both common pool and veto-players perspectives), and finite planning horizons of policymakers. The data will be overviewed in part III and Part IV will provide a statistical test for within-country effects of the theoretical expectations from Part II, including the unobserved probability of executive transition. Part V will discuss the limitations of the results and the way forward. Part VI will conclude.

5 Rationalizing Deficits: Does Fiscal Policy Matter?

“Whether one thinks of deficits as good, bad, or irrelevant therefore depends fundamentally on one’s choice of a paradigm. Certainly no single paradigm corresponds exactly to reality.” -(Bernheim, 1989)-

Until the mid 20th century, deficit financing was theoretically regarded as either economically neutral (Ricardian-Equivalence), or, unnecessarily burdensome on growth given the crowding out effects on private investment (neoclassical). It was, therefore, rarely considered by policymakers as a viable alternative for financing the state unless exogenous shocks necessitated its use (i.e. war). At best, deficit financing was historically regarded as an economically neutral redistribution from the private sector to the state, or, from current to future generations. (Blinder and Solow 1972; Wildavsky and Mariam 1996; Aidt 2009) It wasn’t until the post depression years that a shift in macroeconomic ideology justified the use of deficits, as economists and policymakers searched for effective interventions to stave off future macroeconomic crisis. The resulting ‘Keynesian revolution’ fundamentally transformed the ideological realm within which governments understood, perceived, and engaged in deficit financing. This adoption of Keynesianism also gave policymakers a greater degree of discretionary powers in deciding how much to borrow each fiscal year, justifiable on the grounds of reviving a stagnating economy with the famous ‘multiplier effect’, or, engaging in tax smoothing in order to minimize the inter-temporal economic distortions caused by macroeconomic cycles. (Barro 1979) In order to understand this historically recent ideological shift it is important to review how the idea that making people feel wealthier could actually make them wealthier became widely accepted as true in modern fiscal policy.

5.1 Crowding out, Equivalence and the Multiplier

The neoclassical literature assumes that deficit financing raises total lifetime consumption of a finite horizon (non-myopic) representative individual by shifting the tax burden to subsequent overlapping generations. Lifetime consumption of future representative individuals will necessarily have to decrease in order to finance the deficit of past generations due to the fact that

government's face inter-temporal budget constraint requiring the financing of past debt with a future surplus. In this context, deficit financing can be economically neutral yet places an unfair burden on generations who inherit the debt of past generations creating dynamic distortions in the private market. A second central assumption of the neoclassical literature, which separates it from the Keynesian and Ricardian-Equivalence, is the general equilibrium structure in the private economy (economic resources are fully employed and markets clear in every period). Under this assumption, increased levels of consumption necessarily lead to a decrease in savings. In a closed economy, rising interest rates keep capital markets in balance resulting in relatively larger expected returns from government bonds detracting from investment in the private market, generating a 'crowding out' effect on private capital accumulation. The inevitable negative consequences for growth place unnecessary burdens on the economy and therefore generate sub-optimal fiscal outcomes. This argument has been the centerpiece of the neoclassical arguments against the Keynesian, rejecting the use of deficit financing altogether. Although the crowding out effect has received some support from real world data, the pure Walrasian rational expectation market-clearing models have been subsequently classified as being "more useful for academic advancement than for promotion of economic health." (Eisner 1989) Imperfect markets observed in the real world led to the idea that they could be 'primed' in order to rectify stagnating economies.

The Central difference between the Ricardian-Equivalence framework and the neoclassical is the characterization of successive generations. While the neoclassical literature assumes that generations do not overlap, Ricardian-Equivalence views generations as being linked through inter-generational resource transfers. Given that *i*) consumers are rational and farsighted, *ii*) the postponement of taxes does not redistribute resources across families with systematically different marginal propensities to consume, *iii*) the use of deficits does not create value, and *iv*) the availability of deficit financing does not alter the political process; consumption is determined as a function of dynastic resources (individual consumption is a function of present and discounted expected future dynastic wealth). Since deficits merely shift or postpone the payment of taxes to future generations, they leave dynastic resources unaffected and individuals indifferent. This is to say that deficits have no short or long run economic effects, they merely postpone taxes. The stringent requirements for Ricardian equivalence to hold, however, has led to the widely accepted view that it is "predicated upon extreme and unrealistic assumptions" (Bernheim, 1989), and, relaxing these assumptions does not give any directional forecasts for deviations from neutrality. (Boskin 1988)

Ricardian Equivalence was revived in the late eighties where the often criticized infinite planning horizon problem was rectified by perceiving extended families as dynastic units in

the sense that each family is thought to be a single infinite lived agent. (Barro 1979) Within this Ricardian-Equivalence framework, Barro proposed that social planners could engage in ‘tax smoothing’ to counter-act the economic distortions created by volatility in budget cycles. This provided the only grounds, outside a Keynesian framework, which advocated the discretionary fiscal intervention of policymakers. Tax smoothing assumes that governments are confronted with a revenue generating production function characterized by positive first and second order relationship with real tax rate. Given the shape of this cost function, along with government’s inter-temporal budget constraint, minimizing the present value of these revenue generating costs requires that policymakers hold tax rates constant over time. Confronted with cyclical volatility, or exogenous shocks in income levels, the desire to maintain constant (‘smooth’) tax levels over time leads policymakers to generate surpluses in good times to finance the debt incurred in the bad times. The ‘tax smoothing’ solution is shown to dominate the balanced budget approach as welfare gains are maximized where tax ratio’s are constant over time. Where no cycles exist, and in the absence of exogenous shocks, tax smoothing would advocate a balanced budget in every period. Where cycles do exist, distortions created by this volatility can thus be smoothed out with appropriate fiscal policy. (Barro 1979) In this context there are potential benefits to be derived from some degree of debt flexibility, however, it is important to note that policymakers are assumed to act as rational and farsighted social welfare maximizer; an assumption that has taken its place as a normative economic principle. (Weingast, Shepsle and Johnsen 1981)

Both the neoclassical and Ricardian-Equivalence paradigms place emphasis on individual planning horizons. In the case of the neoclassical literature, individuals must be farsighted and rational. In the case of Ricardian-Equivalence, individuals must, in addition to the neoclassical assumptions, possess altruistic or dynastic resource transfers to subsequent generations. These paradigms assume government behavior to be unimportant as governments are powerless in affecting aggregate levels of spending and employment in the economy. The importance of policymaker planning horizons, was therefore never extended to a general equilibrium framework which considered objective functions of those who supply discretionary spending as well as those who finance it. In this context, discretionary behavior of policymakers is irrelevant as they are deemed, at best, economically neutral. In the tax smoothing scenario, where discretionary fiscal policy is prescribed, governments are assumed to act benevolently in the sense that deficits are only used to minimize inter-temporal distortionary burdens. Nevertheless, if deficit financing is envisioned as being either neutral or harmful, the behavior and objective function of policymakers is *ipsos facto* irrelevant.

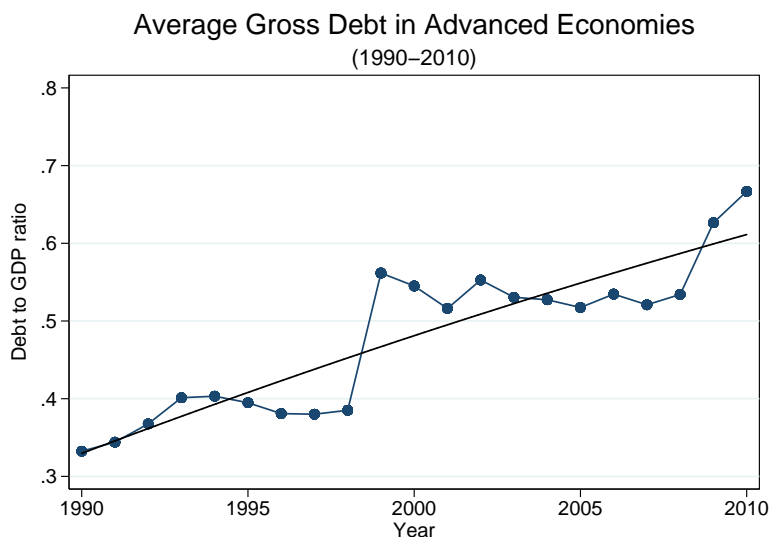
By the mid 20th century, the assumptional irrelevance of policymaker objectives became more difficult to justify as the Keynesian revolution took hold and fiscal policy became more

flexible. The Keynesian view differs from Neoclassical in two fundamental ways. Firstly, it assumes that some economic resources are underemployed. This allows increases in government spending to generate increases in national income through the famous 'multiplier' effect, where national income rises at a greater than unity with unit increases in government output. If deficit spending can increase both consumption and income it is possible that no adverse effects on capital accumulation need occur. It should be noted, however, that any bond financed increase in government output in a closed economy will still generate crowding out effects as interest rates increase. Secondly, Keynesianism presupposes the existence of a large number of myopic or liquidity constrained individuals, which guarantees that aggregate consumption is sensitive to changes in disposable income. This assumption ensures that, when governments increase spending, so too do the nominally wealthier consumers which puts the multiplier effect in motion. Empirical evidence has estimated the net deficit for tax substitution effect on consumption of between twenty and forty cents per dollar (see Boskin 1988) validating the idea that making individuals feel wealthier will indeed make them wealthier, and banishing the old neoclassical view that government spending simply crowded out private spending "to the scrapheap of discarded economic doctrines." (Blinder and Solow 1972)

Keynesian dominance of government macroeconomic ideology since the second half of the 20th century has also meant that deficit financing is a relatively new tool for government to influence fiscal outcomes and, like any new tool, takes time to learn how to use properly. This is especially true where policymakers seek support from the masses: "even sympathetic observers who advocated government spending to revive economies and relieve human misery wondered whether it would really be possible to turn off the tap after citizens in democracies became accustomed to benefits provided by central government." (Webber and Wildavsky 1986) In the United States, between 1950 and 1974, the total national deficits went from averaging only 0.7% of GDP to 3% of GDP between 1975-1979. This increase has been partly associated with diminishing power of committee chairs and leadership in return for "democratizing' Congress and granting increased power to individual members" through the Budget and Impoundment Act of 1974. (Poterba, 1996) Persistent deficits in many developed democratic states throughout the seventies and eighties led to a revival of interest in how deficit financing was used in practice, leading back to the historically neglected objective function of policymakers. Once the law of budgetary gravity is abandoned in the short run, there must be devices to ensure it's balance in the long run.

Figure 26 shows the accumulation of debt for a selected group of countries for a more recent sample of developed economies for the 1990 - 2010 period, indicating that growing levels of debt were generally a prevalent phenomenon during this period. Similarly, these patterns of debt

Figure 26: General Government Gross Debt as a % of GDP (1990-2010)



accumulation remain difficult to explain with tax smoothing and Keynesianism alone.

6 Fiscal Deficits and Political Institutions

The danger associated with a widespread adoption of Keynesian macroeconomic ideology is its potential abuse by policymakers whose objective functions do not reflect those of the collective societies they govern. Relaxing the benevolent planner assumption increases the likelihood of sub-optimal distortionary budget manipulations, depending on the objective function of those empowered with discretionary fiscal decision making, as well as the political and institutional landscape of the state where they govern. Fiscal distortions can arise where *i*) the full costs of the budget are not fully internalized by policymakers, *ii*) optimal policy changes become impossible because of a large number of fractionalized veto-players, or, *iii*) policymaker have finite time horizons which fosters higher discount rates than those of the general population.

6.1 Fragmentation, Polarization and Ideology

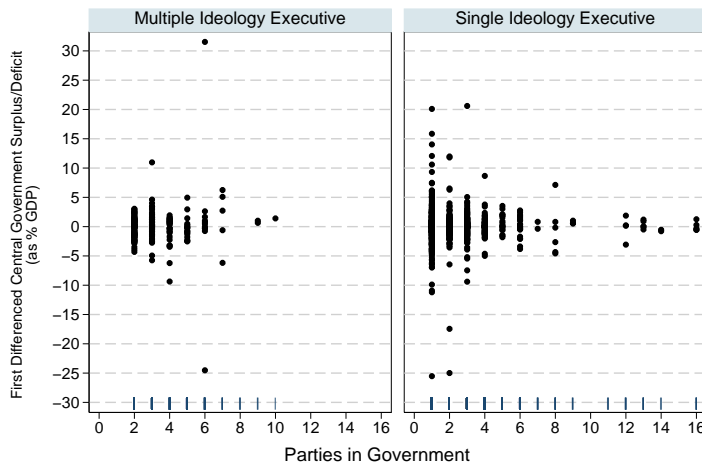
There exist two theoretical avenues for analyzing the relationship between government fragmentation and fiscal performance. Veto player theory, introduced by Tsebelis and later applied to fiscal outcomes by Chang and Tsebelis (2004), demonstrated the increased likelihood of an empty winset as the number of veto players and their ideological distances increase. In the

context of budgeting, this would imply that as the number of, and ideological distance between, veto players increases, the likelihood of any policy changes from the status quo decreases. Slower rates of adjustment in states with relatively larger number of parties in government and spending ministers as well as their ideological range make fiscal reform less likely to occur. (Franzese 2005; Chang and Tsebelis 2004). We should therefore expect that increased levels of ideological polarization and the numbers of veto actors to decrease the likelihood of policy adjustments as was found in Franzese (1995).

Some preliminary evidence is given for a sample of sixty-one countries in Figure 27 which shows the first differenced central government balances for two groups of countries across the number of parties in government. The left hand side graph shows the relationship between changes in fiscal deficits/surplus and parties in government for single ideology central governments. These are government for which the executive is made up of parties from a unified ideology as defined by the Database of Political Institutions. The right hand side graph shows the same relationship for multiple ideology central governments, or, those where the executive is made up of parties representing more than one ideological affiliation. The x-axis shows the number of parties in the executive under each of these subcategories (note that, by definition, there must be more than one party for multiple ideology executives).

The funnel like shape formed by moving from the right hand side to left hand side of the single ideology graph, suggests greater level of flexibility in single party, single ideology governments, which decreases as the number of parties in government increases. This pattern appears to be less clear for multiparty, ideologically dispersed governments where the funnel like shape which appeared in the single ideology executive graph suggesting that these governments are relatively more constrained when it comes to making year-on-year changes to fiscal balances. This preliminary evidence gives partial support for past finding from Chang and Tsebellis (2004) as well as Franzese (2005) who have found that, as the number of veto actors increases, there appear to be smaller changes in fiscal balances.

Figure 27: Executive Polarization, Parties in Government and Central Government Surplus/Deficits

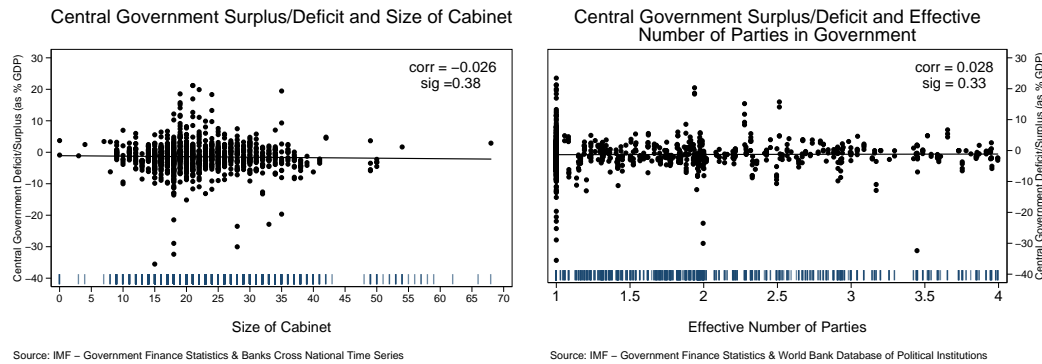


Source: IMF – Government Finance Statistics & World Bank Database of Political Institutions

The common pool problem, on the other hand, emphasizes levels of, rather than changes in, fiscal performance. Where individual policymakers or political parties represent distinct constituencies or ideological subsets of the taxpaying population, each actor will have incentive to protect their constituencies from tax increases, yet will also want to maximize distributive expenditure in their own constituencies. (Weingast, Shepsle and Johnsen 1981) The fact that tax revenues are generated from the entire taxpaying population yet policymakers only feel the burden incurred by their own constituency, leads policymakers to underestimate the national burden of an extra unit of tax revenue relative to the marginal benefit that can be provided to their own constituency. The well known ‘law of $1/N$ ’ leads to the prediction that deviations from optimal social welfare maximizing fiscal policy will be greater as the number of actors who represent subsets of the national purse (spending ministers and parties in government) increases. A higher number of meaningful actors who fail to fully internalize the full costs of raising additional revenue leads to higher than optimal levels of spending and deficit financing. (Shepsle, Weingast and Johnsen 1981; Franzese 1995; Wehner 2010)

Roubini and Sachs were amongst the first to empirically test the relationship between political landscape and budget deficits. Using a pool cross section of OECD countries for the period 1960-1985, they find evidence supporting the hypothesis that dispersion of power (increased N) in the budgeting process positively affects the likelihood of inefficient inter-temporal fiscal out-

Figure 28: Cabinet Size, Effective Number of Parties in Government and Central Government Deficits



comes. Their findings suggest that short lived governments and multiparty coalitions perform relatively poorly at reducing budget deficits. (Roubini and Sachs 1989) The Roubini and Sachs results were subsequently contested, firstly on the grounds of the operationalization of their ‘Index of Political Cohesion’ by Edin and Ohlsson (1991), and then with respect to the party fragmentation finding itself. (DeHaan and Sturm 1997; DeHaan and Volkerink 2001) Edin and Ohlsson note that the ordinal structure of the index itself places unnecessary restrictions on the relative cohesion effects on budgetary outcomes (i.e. the budget effect of a minority government is three times as large as two-party governments) (Edin and Ohlsson 1991) Re-estimating the Roubini and Sachs model with dichotomous indicators for each category of the cohesion index, they find that the budgetary effects found by Roubini and Sachs were entirely due to minority governments rather than increasing linearly with the dispersion of power. Subsequent studies by DeHaan and Volkerink (2001) and DeHaan and Sturm (1997) have found no evidence to support the Roubini and Sachs or the Edin and Ohlsson findings concluding that political fragmentation has no effect on government revenues or expenditure “leaving deficits unaffected.” (Volkerink and DeHaan 2001) Using a panel of 19 OECD countries over the 1970-1995 period, Kontopoulos and Perotti (2002) find some evidence of within-country effects from the number of spending ministers, but very little evidence of an effect from the number of parties; concluding that “The general message we derive from our results and those of the literature is that it is hard to obtain strong evidence, one way or another, on the effects of budget procedures at the country level.” (Kontopoulos and Perotti 2002) Figure 28 gives little preliminary evidence to support an unconditional relationship between cabinet size and effective number of parties in government and central government deficits/surplus.

Both of the veto player and common pool traditions emphasize the role of political conflict as it distorts the budgeting process, generating sub-optimal fiscal outcomes. While veto players attempts to predict the magnitude of fiscal volatility or rates of adjustment, the common pool resource problem emphasizes directional changes. We should therefore expect that as the number of, and ideological distance between, meaningful actors in the budget process increases, there should be less volatility (veto players). Any small deviation from the status quo should, however, have a negative correlation (decrease in fiscal balances) with the number of policymakers as they only internalizes the burdens of those taxpayers whom they represent (common pool). Likewise, a small number of ideologically homogeneous policymakers should be free to make larger year-on-year adjustments and will tend closer to optimal levels of debt than larger and more polarized executives. Empirical evidence has shown some support for a veto players effect, with less consistent support for those predicted by the common pool problem. The preliminary evidence gives some indication that countries with smaller numbers of parties in governments have greater year-on-year budget flexibility but there does not seem to be any clear evidence of additional associations with ideological dispersion. Less support is found for the common pool problem, suggesting that it may be the degree to which policymakers internalize *future*, rather than present, distortionary burdens.

6.2 Time Horizons

There are two ways in which to characterize the relationship between expected tenure and fiscal performance. Where incumbent government's face an exogenously given probability of being in office at time $t + 1$ which is less than unity, the likelihood that they will use the law of motion of public debt to influence successive administrations discretionary budgeting powers is expected to increase. (Alesina and Tabellini 1989, Persson and Svensson 1989, Devereux and Wen 1998, Debrun and Kumar 2007) The implication for fiscal performance would be larger deficits in years where there exists a high expected probability that the executive in office in period t , will not be in office in period $t + 1$. It is also possible that the same executive may use fiscal policy as a campaigning device; increasing government expenditures in years where the probability of a transition is high in order to 'buy back' the voters. These two scenarios make it difficult to separate out whether a defeated executive generated high levels of debt to constrain their successor, or, a winning executive was successful because of deficit financed increases in support. From a theoretical perspective, an easy solution would be to exogenously impose the probability of remaining in office in order to concentrate on the fiscal discount effect with comparative statics.

Alesina and Tabellini take on such an approach proposing a model where citizen disagree-

ment, rather than myopia, influences fiscal policy in democracies. Two parties are assumed to choose the same levels of taxation and public consumption (private consumption-leisure trade-off are equal under both parties), but differ with respect to preferences for the composition of public goods. The incumbent government's objective functions is time separable into an intra period problem of choosing taxes and provision of public goods for a given deficit (static), and, an inter-temporal problem of choosing the size of the deficit (dynamic). This inter-temporal fiscal decision is influenced by the (exogenous) probability of the executive remaining in office in future periods as well as the distance between the preferences of incumbents and successor administrations. For example, a right wing incumbent who knows with a high probability that they will lose power to a left wing successor, can strategically use deficit spending on their preferred composition of expenditures in order to constrain their successors ability to provide its preferred composition. In equilibrium, policymakers set their marginal utility of leaving debt to the future equal to the expected marginal cost of inheriting that debt tomorrow discounted to the present day. This implies that incumbents who have low expectations of inheriting future debt, will fail to internalize the inter-temporal distortions created by running large deficits. Government's who discount the future at higher rates than the general public will run larger than optimal deficits in order to increase expenditure on their preferred bundle of public goods at time t while constraining future governments from spending on their less preferred compositions at time $t + 1$. Alternatively, a social planner with infinite horizons (re-appointed with probability of one), adopts a social welfare maximizing weighted average of the preferences of the citizens and balance the budget in every period. (Alesina and Tabellini 1990) From this, it should be expected that high degrees of polarization between party preferences, and low levels of probabilistic executive tenure to generate sub-optimal fiscal outcomes and relatively higher levels of equilibrium debt (*ceteris paribus*).

Persson and Svensson (1989) take on a similar approach, but assume policymakers to possess different preferences for the level, rather than composition of, government expenditure. Finite horizon governments are confronted with a trade-off between two types of distortions: volume distortions, which occur where government consumption is higher than the optimal level preferred by that government, and; inter-temporal distortion which occurs where, for a given level of public consumption, the time profile of taxes differs from the *ex ante* optimum solution. Assuming that policymakers are forward looking, strategic, and inherited debt has an effect on newly elected governments taxation and spending decisions, 'stubborn' incumbents who put a significant amount of weight on minimizing volume distortions relative to inter-temporal distortions should be expected to borrow more than it would if it had infinite planning horizons. (Persson and Svensson 1989) This is to say that governments who know with some (exogenously given) probability that they will hand over power to a new administration with different preferences

for levels of government consumption, will choose to leave a deficit/surplus in order to force its successor to spend less (in the case of a conservative government) or more (in the case of a liberal government). Again, the ideological distance between current and expected future incumbents, as well as probabilistic tenure of the current executive, are both expected to generate significant distortionary effects on fiscal outcomes.

Treating the probability of remaining in office in the next period as exogenously given assumes away the possibility that it is partially dependent on government's performance, which is likely to influence the longevity of policymakers tenure in office. (Dewan and Myatt 2010) For example, policymakers may use deficit financing strategically to increase their perceived relative performance in close elections. (Milesi-Ferretti and Spolaore 1994) In order for this phenomenon to hold there must exist some degree of fiscal illusion where voters do not understand the inter-temporal budget constraint of the government and overestimate the benefits of current expenditures relative to the future tax burden. Opportunistic office seeking politicians can take advantage of this illusion by deficit financing new spending (without increasing taxation) in order to buy public support in years where the probability of an executive transition is high. (Alesina and Perotti 1995) The probability of being in office in the next period and thus the degree to which policymakers internalize future distortionary burdens can therefore both affect, and, be affected by, fiscal outcomes. Political parties will discount the future to the extent that they believe they will no longer be in power, however, their likelihood of remaining in power can be influenced by expansionary fiscal policy. This endogeneity problem has made it difficult for researchers to measure the effects of expected tenure (outside of a fixed term limit context) on fiscal outcomes.

The small number of empirical contributions thus far have either worked within the context of fixed term limits (Besley and Case 1995; Carey 1996; Zupan 1991) or have ignored the endogeneity of expected tenure, focusing instead on exogenously given levels of government stability or average tenure (Debrun and Kumar 2007; Edwards and Tabellini 1991) From a fixed term limit context, Besley and Case (1995) find evidence that exogenously imposed term limits have a significant effect of fiscal policy outcomes in US gubernatorial elections over the 1950-1986 period. The results suggest that governors who are ineligible to stand for election in the following period are found to generate higher levels of sales taxes (7-8\$ per capita on average), income taxes (9\$ per capita on average) and state expenditure (15\$ per capita on average). Outside of a fixed term limit framework, Debrun and Kumar (2007) find evidence from a sample of 18 European Union economies over the 1990-2004 period, that decreases in government stability (which they dub a "plausible proxy of the risk faced by an incumbent of being voted out") generates negative effects on cyclically adjusted primary balances (CAPB)

to the extent that very unstable governments will, on average, run one percent of GDP higher CAPB than very stable ones (*ceteris paribus*). Finally, Edwards and Tabellini (1991) find some support for a positive relationship between fiscal deficits and the frequency of government changes for a sample of 42 developing countries between 1963-1988, validating the theoretical expectation that “the policymaker may wish to borrow in excess of the optimum, and let his successor ‘pay the bills’.”

The central theme in all of these studies is the importance of finite horizon policymakers whose interest in efficient future fiscal outcomes is influenced by the (exogenous or endogenous) probability that they will be in office in time $t + 1$. Theoretical contributions suggest that as this probability increases, executives are more likely to internalize the future costs of deficit financing the present. Although little is known about the validity of these models (Besley and Case 1995), the sparse empirical evidence thus far has suggested that finite planning horizon effects do indeed exist in the same direction as predicted in the theoretical literature. These empirical studies have, however, been limited by the potential endogeneity of expected planning horizons which have yet to be tested in a statistically appropriate framework.

7 The Data

Data on GDP growth, population, unemployment, inflation and interest rates was taken from the World Banks World Development Indicators (WB-WDI) for the years 1990-2006. Consolidated central government deficits/surplus figures were computed from International Monetary Fund Government Finance Statistics for the years 1990-2006.⁴⁸ The cost of financing the deficit is computed as the interest rate net of GDP growth. With respect to political variables, selection was limited by the scope of the analysis. Data on cabinet size was obtained from Banks Cross National Time Series data set (2010) Given that this data measures raw size without considering the distribution of power, for example in the case of Canada and New Zealand, who are coded as having as high as 50 and 68 cabinet ministers, respectively, it is admittedly an imperfect measure but does provide a proxy for the common pool problem. Ideology is classified into one of three categories of left right and center (see World Bank - Database of Political Institutions (DPI) 2006, p.6-7 for definitions). Again, this is a crude measure but does capture fundamental differences in party economic ideology. Government polarization is also taken from DPI but recoded as the maximum distance (using the left, center, right classification) between the executive party and the three largest parties in government rather than including the largest opposition party as well. Theoretical findings do suggest that ideological affiliation of opposition parties should be expected to play a role in the fiscal decisions of the executive where there is

⁴⁸For countries who reported using accrual accounting, net lending/borrowing was computed.

an ideological divergence (i.e. left executive and right opposition, or vice-versa). Where the executive expects that a transition of power will also be a transition of government ideology, we should expect different fiscal behaviour, relative to a transition of power without a change in government ideology (see Alesina and Tabellini 1989 and Testa 2010). In order to capture this effect, two binary variables are created, the first equaling one where the executive is predominantly affiliated with right-wing ideology and the main opposition party affiliated with left-wing ideology (zero otherwise), and the second equaling one where the executive is predominantly affiliated with left-wing ideology and the main opposition party affiliated with right-wing ideology (zero otherwise). The raw data for this variable is taken from DPI and the variables are coded by the author. A change in the executive is also coded dichotomously, equaling one in years where the executive in year t was not the same as the executive in year $t + 1$. (DPI 2006) There was sufficient information on all dimensions to examine fiscal effects in a globally representative sample of sixty-one countries. I also exclude any country which experienced unique economic circumstances or economic crisis during the sample time interval. (inflation greater than 100% - Zimbabwe 2007; or deficits greater than 100% of GDP - Kuwait 1991)⁴⁹ A list of variables and summary statistics is provided below in Table 4 for the full sample of 61 countries.

⁴⁹I run the analysis below with these country-years included and get very similar parameter estimates to those produced.

Table 4: Summary Statistics

Variable	Mean (s.d.)	Min	Max	Source
Central Government Surplus/Deficit (%GDP) *	-1.13 (4.29)	-32.39	21.22	IMF-GFS ^a & IMF-IFS ^b
GDP growth	3.80 (3.57)	-13.13	18.29	WB-WDI ^c
Inflation (CPI)	8.59 (12.51)	-13.84	99.88	WB-WDI
Unemployment (annual)	8.14 (4.29)	0.90	23.90	WB-WDI
Debt Service Costs *	3.45 (9.71)	-35.12	98.01	WB-WDI
Polarization *	1.62 (0.96)	0	3	DPI ^d
Parties in Government *	2.46 (2.12)	1	16	DPI
Effective Number of Parties in Government *	1.55 (0.80)	1	3.99	DPI
Size of Cabinet	22.10 (7.89)	3	68	Banks CNTS ^e
Dominant Left Executive *	0.32	0	1	DPI
Executive transition *	0.14	0	1	DPI
Legislative election	0.26	0	1	DPI
Executive election	0.09	0	1	DPI
Executive length of time in office	8.00 (9.74)	1	71	DPI
Government Fractionalization	0.28 (0.28)	0	0.89	DPI
Left Executive/Right Opposition *	0.17 (0.38)	0	1	DPI
Right Executive/Left Opposition *	0.18 (0.38)	0	1	DPI

*- Computed from source by author

^a – International Monetary Fund Government Finance Statistics (2009)

^b – International Monetary Fund International Finance Statistics (2009)

^c – World Bank World Development Indicators (2009)

^d – World Bank Database of Political Institutions (2009)

^e – Banks Cross National Time Series (2010)

8 Estimation

Roubini and Sachs's suggest that reverse causality between planning horizons and fiscal outcomes are "highly doubtful" given that the regime character depends on the constitutional process which tends to be fairly stable over time. (Roubini and Sachs 1989) For example, proportional representation electoral systems are well known to produce short lived multiparty governments relative to majoritarian systems, but it is very difficult for policymakers to change the electoral system to increase their tenure in government. In the years where elections do take place, however, reverse causality remains a possibility where governments may run larger deficits in order to increase their popularity in an election year without increasing taxation. (Milesi-Ferretti and Spolaore 1994) In order to rectify this with Roubini and Sachs, we must separate the effects of: *i*) elections, whose frequency varies across political systems, and; *ii*) the probability of being elected, when an election does take place.

I begin with a simple fixed effects model regressing central government fiscal balances on fragmentation (effective number of parties in government), polarization, government ideology, year of executive elections, number of cabinet ministers and tax smoothing variables (unemployment, GDP growth and debt service costs). Common pool resource problem and veto player theory would suggest that both size and government fragmentation should have directional (temporal) and variability (inter-temporal), respectively, effects on government balances. Fragmentation is measured using the effective number of parties in the executive, and the number of cabinet ministers. It should be expected that as the number of veto players increase, as well as their ideological distance, policy changes become more difficult to pass, making adjustments slower. To test for this possibility, I include two interactions terms between a one period lagged surplus/deficit and the number of parties in government as well as government polarization.⁵⁰ I also include dummy variables for ideologically dominated left wing executives to capture any potential effects from ideology of the executive.⁵¹ I estimate the equation for central government surplus as:

$$\begin{cases} y_{i,t} = & \alpha_i + \delta change_{i,t} + \rho_1 y_{i,t-1} + \rho_2 (|y_{i,t-1}| * polar_{i,t}) + \rho_3 (|y_{i,t-1}| * pig_{i,t}) \\ & + \beta_1 enop_{i,t} + \beta_2 polar_{i,t} + \beta_3 cabsize_{i,t} + \beta_4 left_{i,t} + \mathbf{X}_{i,t}\theta + \varepsilon_{i,t} \end{cases} \quad (13)$$

Where the interaction terms with lagged surplus/deficits (polarization and parties in government) are measured with absolute values as veto player theory argues that the number of

⁵⁰A similar approach was used by Franzese (2005)

⁵¹It should be noted that electoral system are not included in equation (13) as these are absorbed in the country fixed effects (as is the case of any other time invariant country characteristics over the sample period).

veto players should constrain the magnitude, rather than direction, of year-on-year changes in fiscal performance (Tsebellis 2002, Franzese 2005), and :

$y_{i,t}$ is the cash surplus/deficit as a percentage of GDP in country i at time t

α_i is an unobserved intercept for country i

$enop_{i,t}$ is the effective number of parties in government in country i at time t

$polar_{i,t}$ represents the ideological polarization of the three largest parties in government in country i at time t

$pig_{i,t}$ is the number of parties in government in country i at time t

$change_{i,t}$ is a dummy variable representing the year of an executive transition in country i at time t

$cabsize_{i,t}$ is the cabinet size of country i at time t

$left_{i,t}$ is a binary indicator of whether the executive was majority left wing in country i at time t

\mathbf{X} is a matrix of economic tax smoothing controls (GDP growth, inflation, annual unemployment rates and debt service costs)

ρ_q, β_p, θ are unknown parameters to be estimated ($q = 1, 2, 3; p = 1, \dots, 5$)

I also assume spherical disturbances, such that:

$$\varepsilon_{it} \sim N(0, \varepsilon^2)$$

$$cov((), \varepsilon_{it}) = 0$$

$$cov(\varepsilon_{it-1}, \varepsilon_{it}) = 0$$

8.1 Results

The results from three specifications are given below in Table 5. The first is a simple fit with no interaction terms, the second builds on past theoretical and empirical findings discussed in equation (13), and the third substitutes election variables with a binary indicator of executive turnovers.

Table 5: Within Country Determinants of Cash Balances
(Fixed effects with standard errors in parenthesis)

Variables	Central Government Surplus\Deficit (% GDP)	Central Government Surplus\Deficit (% GDP)	Central Government Surplus\Deficit (% GDP)
Central Government Surplus\Deficit (t-1)	0.55*** (0.03)	0.65*** (0.04)	0.65*** (0.04)
Central Government Surplus\Deficit(t-1)* Polarization		0.03 (0.05)	0.03 (0.05)
Cash Surplus\Deficit(t-1)* Parties in Government		0.06*** (0.02)	0.06*** (0.02)
Effective Number of Parties	0.16 (0.36)	0.04 (0.36)	-0.10 (0.24)
Left-wing Executive	0.23* (0.49)	0.07 (0.48)	0.09 (0.48)
Cabinet size	-0.002 (0.04)	-0.003 (0.03)	-0.001 (0.03)
GDP growth	0.14*** (0.04)	0.14*** (0.04)	0.14*** (0.04)
Inflation	0.01 (0.01)	0.01 (0.01)	0.01 (0.01)
Unemployment	-0.18*** (0.05)	-0.17*** (0.05)	-0.16*** (0.05)
Debt Service Cost	-0.05*** (0.02)	-0.05*** (0.02)	-0.05*** (0.02)
Right executive/Left opposition	0.22 (0.48)	-0.02 (0.47)	-0.04 (0.47)
Left opposition/Right executive	0.59 (0.54)	0.53 (0.53)	0.52 (0.54)
Legislative Election	-0.32 (0.24)	-0.35 (0.23)	
Executive Election	-0.07 (0.35)	0.06 (0.34)	
Government Fractionalization	0.51 (0.99)	-0.68 (1.00)	
Executive Transition			-0.25 (0.27)
Constant	0.24 (1.05)	0.34 (1.03)	0.30 (1.00)
Countries	61	61	61
Observations	653	96 653	653
R-sq (within)	0.42	0.44	0.47
R-sq (between)	.078	0.76	0.78
R-squared (overall)	0.64	0.61	0.64

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

Consistent with past findings, the evidence in Table 5 suggests that levels of central government fiscal balances during the 1990-2006 period are largely determined by fiscal inertia and economic circumstances. As would be expected in Barro's tax smoothing framework, unemployment and debt service costs significantly reduce fiscal surplus's/increase deficits, while GDP growth has a significant positive effects. With respect to executive fragmentation, there is evidence, as was found in Franzese (2005), that the number of parties in government decreases rates of adjustment (veto players). This can be seen from the positive interaction term between lagged balances and the number of parties in government. There also appears to be little evidence of any common pool effect on the levels of fiscal performance from the number of cabinet ministers and effective number of parties in government. This finding runs contrary to the findings of Volkerink and DeHaan (2001) who find that the effective number of parties and number of cabinet ministers both have a significant negative associations with government debt in a sample of twenty-two OECD countries for the earlier 1971-1996 period. These findings were, however, largely associated with the 1970's and several subsequent studies have confirmed the lack of direct association between the effective number of parties in government and fiscal outcomes in more updated samples. (Kontopolous and Perotti 2002; Franzese 2005; Debrun and Kumar 2007) In the second column of Table 5, I include three variables which are likely to have a significant effect on the probability of an executive transition; mainly, election years and government fractionalization. None of these appear to have a direct correlation with fiscal balances at conventional levels of significance. The third column of Table 5 shows estimates which include a binary indicator for the event of an executive transition which also suggests that no significant correlation exists between a transition and fiscal balances.

Although there appears to be no significant association between executive transitions and central government fiscal balances, the planning horizons literature suggests that the 'true' effect on fiscal performance is generated through the probability of remaining in office in year $t + 1$ rather than a simple binary indicator for whether a transition took place. It should be expected that, where an executive transition takes place with an *a priori* perceived low likelihood (i.e. the executive expects to remain in office in $t + 1$ with a high probability), these governments will be more likely to internalize the costs of future debt and generate lower deficits than incumbents who perceive a high *a priori* likelihood of a transition. In such cases, the estimates from (13) will be biased upwards as they assume that all transitions were fully known to those who left office. Past findings of significant election year effects (Debrun and Kumar 2007; Wehner 2010) may be a reflection of this probability, but like the binary transition indicator, is also measured with error. The omission of the continuous unobserved likelihood of an executive transition along with the potential for expected planning horizons to both affect and be affected by fiscal

outcomes makes it likely that the assumption of exogeneity will be violated in equation (13).

9 Unobserved Transition Probabilities and the Endogeneity Problem

Given that the likelihood of remaining in office is expected to have a significant impact on the degree to which current policymakers internalize future burdens from the accumulation of public debt, the error term in equation (13) should correlate with this unobserved likelihood. Given the additional possibility that governments may use fiscal policy as a device to increase their popularity in election years (in the context of myopic voters or asymmetric information), it is also possible that there exists an endogeneity problem where transition probabilities are partially determined within the equation of fiscal performance.

Assuming the 'true' equation for central government fiscal balances is:

$$\begin{cases} y_{i,t} = & \alpha_i + \lambda ptrans_{i,t}^* + \rho_1 y_{i,t-1} + \rho_2 (|y_{i,t-1}| * polar_{i,t}) + \rho_3 (|y_{i,t-1}| * pig_{i,t}) + \\ & \beta_1 enop_{i,t} + \beta_2 polar_{i,t} + \beta_4 cabsize_{i,t} + \mathbf{X}_{i,t}\theta + \varepsilon_{i,t} \end{cases} \quad (14)$$

Where,

$ptrans_{i,t}^*$ is the true continuous unobserved probability of an executive transition in country i at time t .

Because $ptrans_{i,t}^*$ is a latent variable, equation (13) estimates the effect of executive planning horizons with error ($change_{i,t} = ptrans_{i,t}^* + v_{i,t}$). Substituting this back into equation (1) gives,

$$\begin{cases} y_{i,t} = & \alpha_i + \lambda(change_{i,t} + v_{i,t}) + \rho_1 y_{i,t-1} + \rho_2 (|y_{i,t-1}| * polar_{i,t}) + \\ & \rho_3 (|y_{i,t-1}| * pig_{i,t}) + \beta_1 enop_{i,t} + \beta_2 polar_{i,t} + \beta_4 cabsize_{i,t} + \mathbf{X}_{i,t}\theta + \varepsilon_{i,t} \end{cases} \quad (15)$$

suggesting that $cov[change_{i,t}, (\varepsilon_{i,t} - \lambda v_{i,t})] = -\lambda \sigma_v^2 \neq 0$ which makes the parameter estimates from (13) inconsistent. (Greene 2008; Wooldridge 2002)

In order to obtain efficient estimates for the 'true' equation, it must be taken into account that $change_{i,t}$ is observed with error as in (15). Endogenous Treatment Effects models simultaneously estimate a probit model to obtain the continuous expected likelihood of an executive transition (the endogenous treatment), and linear model of annual central government surplus/deficit as a

function of this likelihood.⁵² The event of an executive transition is therefore modeled as the outcome of a latent variable reflecting the expected probability of an executive transition:

$$ptrans_{i,t}^* = w_{i,t}\gamma + u_{i,t} \quad (16)$$

Where $w_{i,t}$ is a matrix with excluded variables:

$legelec_{i,t}$ takes on a value of one in years of executive or parliamentary election for country i in year t

$govfrac_{i,t}$ is a measure of government fractionalization (DPI) for country i in year t

$tio_{i,t}$ is the number of years that the executive has been in office for country i in year t

Estimating equation (16) as a probit function explicitly takes into account the logical $[0, 1]$ bounds of the transition probability, where, $\varepsilon \sim N(0, \sigma^2)$ and $u \sim N(0, 1)$ with covariance matrix:

$$\begin{bmatrix} \sigma^2 & \tau\sigma \\ \tau\sigma & 1 \end{bmatrix}$$

By estimating equations (14) and (16) simultaneously, the predicted difference between executives who fully expected to be in office at $t + 1$ relative to those who fully expect not to be in office explicitly takes into the correlation between the two equations revealing the bias in the parameter estimates from equation (13). In the two stage case, this difference is measure as:

$$(\hat{y}_{i,t}|ptrans_{i,t}^* = 1) - (\hat{y}_{i,t}|ptrans_{i,t}^* = 0) = \delta + \tau\sigma \left[\frac{\phi(w_{i,t}\gamma)}{\Phi(w_{i,t}\gamma)[1 - \Phi(w_{i,t}\gamma)]} \right]$$

Where ϕ and Φ are the standard normal density and standard normal cumulative distributions respectively, and, $\tau = corr(\varepsilon_{i,t}, u_{i,t})$. In the case of fiscal balances, we would expect a positive hazard rate effect where increases in the probability of a transition leads to higher deficits than were estimated in (1). The Treatment Effects model can be estimated simultaneously using maximum likelihood or a two-step approach, where parameter estimates are obtained by augmenting the regression equation (13) with the estimated hazard rate ($\tau\sigma$) which produce consistent parameter estimates. A failure to reject the hypothesis that $\tau = 0$ would indicate that there is no endogeneity problem and the true equation is that estimated in equation (13). The downfall to these models is the restrictive distributional assumption of a joint normal density of the error terms in equations (15) and (16). This assumption of conditional independence

⁵²along with other covariates from (13).

required in order to identify a treatment effect is often implausible in application due to potential omitted variable problems. (see Greene 2008) Instrumental variable methods is one way of solving this problem of missing or unknown controls.

In order to identify valid instrument for expected time horizons, or the probability of being in office in period $t + 1$, requires valid predictors of executive transitions which are uncorrelated with the error term in (15), $\varepsilon_{i,t}$. Presumably this unobserved probability is significant correlated with election years. While it remains a possibility that these instruments suffer from the same endogeneity problem as expected planning horizons, it could likely be the case that election years themselves only correlate with fiscal balances through the probability of remaining in office, rather than the event of an election alone. This is to say that, fiscal decisions of incumbent executives who believe that they will remain in office in the following period with a probability of one, will not be influenced by an election year making the event irrelevant in their fiscal actions for that year. Although the results in Table 5 validate this expectation, past findings have suggested that election years themselves are significant predictors of government balances. (Debrun and Kumar 2007; Wehner 2010) I therefore provide a further test for its validity as an excluded instrument and include the number of years the executive has been in office as well as government fractionalization as other possible instrument. From a practical perspective, these are all good candidates for instruments for expected planning horizons as it should be expected that any executive should have access to this information prior to the election and use it to predict their likelihood of success.

I estimate the same equation as in (16) but the probability of an executive transition is modeled as a linear, rather than probit, function of the included and excluded variables. Using a Two Stage Least Squares estimator, can predict first stage probabilities outside of the $[0, 1]$ boundary, but still produces efficient estimates of λ . (see Wooldridge 2002) The first stage estimates the linear probability of an executive transition as:

$$ptrans_{i,t}^* = w_{i,t}v + \varepsilon_{i,t} \tag{17}$$

Where $w_{i,t}$ contains all of the exogenous covariates from equation (15) as well as the excluded instruments mentioned above. (year of election, government fractionalization and the executive number of years in office) and, unlike the Treatment Effects estimator, $cov(\varepsilon_{i,t}, \varepsilon_{i,t}) = 0$. The over-identification of the reduced form equation (5) allows for a test of the assumption that the residuals in equation (16) are uncorrelated with $\varepsilon_{i,t}$ using the Sargan-Hansen statistic. I also estimate equations (14) and (16) using a Generalized Method of Moments (GMM) estimator

which is asymptotically more efficient than the Two Stage Least Squares estimator in the presence of heteroskedasticity. (Baum et al. 2003) Given that the efficiency gains from the GMM estimators optimal weighting matrix is a function of fourth moments, requires very large sample sizes to obtain reasonable estimates. I therefore report results from both estimators below.

The tradeoff between the Endogenous Treatment Effects model and the IV approach is one between robustness and efficiency. While treatment effects may give increased precision of the estimates, if the hard to meet joint distributional assumption does not hold, the estimator becomes inconsistent. (Cameron and Trivedi 2010; Greene 2008) IV estimators are not susceptible to violations of this assumption making them more efficient when the assumptions of the Treatment Effects model are not met. The downfall of the IV estimator is the inability to take into account the structural unit simplex constraint on the probability of remaining in office. Estimates from both specifications are provided below with bootstrapped standard errors.

9.1 Results

The first and second stage results are given below in Table 6.

Table 6: Treatment Effects and Instrumental Variable Estimates
(Bootstrapped standard errors in parenthesis)

First Stage (Executive Turnover)

Excluded Instruments	Executive Turnover (Probit)	Executive Turnover (Linear)
Legislative Election	1.39*** (0.15)	0.30*** (0.04)
Executive Election	1.04*** (0.19)	0.30*** (0.06)
Government Fractionalization	0.72 (0.48)	0.06 (0.17)
Executive Years in Office	-0.003 (0.008)	0.02*** (0.004)

Second Stage (Central Government Fiscal Performance)

Variables	CG Surplus\Deficit (% GDP)	CG Surplus\Deficit (% GDP)	CG Surplus\Deficit (% GDP)
	Endogenous Treatment Effects	TSLS-IV*	GMM-IV*
Central Government Surplus\Deficit (t-1)	0.65*** (0.04)	0.65*** (0.06)	0.67*** (0.06)
Surplus\Deficit(t-1)* Polarization	0.04 (0.04)	0.03 (0.11)	0.03 (0.11)
Surplus\Deficit(t-1)* Parties in Government	0.06*** (0.01)	0.06** (0.03)	0.05* (0.03)
Effective Number of Parties	-0.11 (0.24)	-0.14 (0.32)	-0.17 (0.32)
Cabinet Size	-0.00 (0.03)	-0.00 (0.03)	-0.01 (0.03)
GDP growth	0.13*** (0.04)	0.14*** (0.03)	0.14*** (0.03)
Left-wing Executive	0.29 (0.48)	0.19 (0.80)	0.36 (0.39)
Inflation	-0.01 (0.01)	0.001 (0.01)	0.00 (0.01)
Unemployment	-0.20*** (0.05)	-0.18*** (0.07)	-0.17*** (0.06)
Debt Service Cost	-0.05*** (0.02)	-0.05** (0.02)	-0.05** (0.02)
Right executive/Left opposition	0.33 (0.46)	0.06 (0.43)	0.04 (0.45)
Left opposition/Right executive	0.63 (0.52)	0.50 (0.54)	0.53 (0.49)
Likelihood of Executive Transition ^a	-1.73*** (0.47)	-0.75* (0.41)	-0.72* (0.41)
rho (s.e.) ^b	0.61 (0.12)	102	
R-sq (Centred)		0.47	0.47
Countries	61	61	61
Observations	634	634	634

* - standard errors are estimated from 100 bootstraps

^a - Sargan statistic for overidentification=2.54 (p=0.47) in both TSLS-IV and GMM-IV

^b - Wald statistic for $H_0: \rho=0$; $\chi_1^2 = 6.78$ (p < .009)

Standard errors in parentheses (* from 100 bootstraps)

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

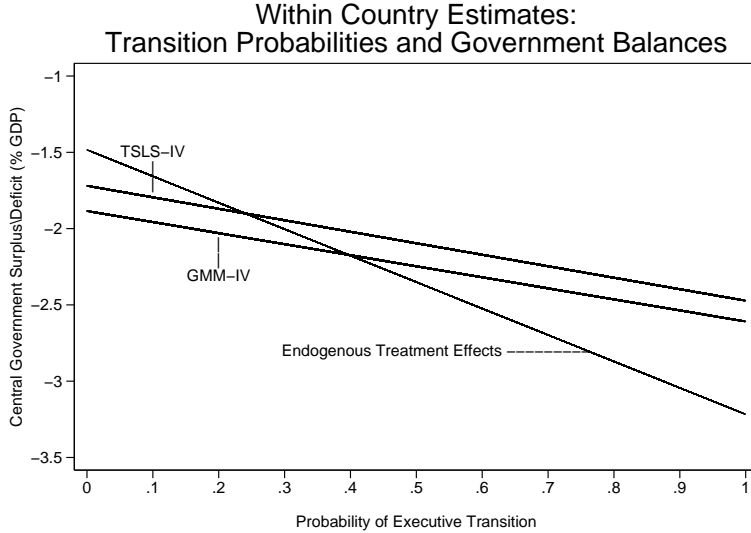
The first column of Table 6 provides parameter estimates from the maximum likelihood Endogenous Treatment Effects estimator and the second and third columns provides parameter estimates from the TSLS-IV and GMM-IV estimators. Consistent with the findings in Table 1, fiscal inertia and economic circumstances are strong predictors of central government fiscal balances. Again, there is evidence from all three estimators that the number of parties in government decreases rates of adjustment (veto players), but little evidence of any common pool effect (cabinet size, effective number of parties in government).

Taking into account the continuous likelihood of expected planning horizons, the results from all three estimators suggests that the unobserved probability ($ptrans_{i,t}^*$) of being in office at time $t + 1$ is significantly correlated with fiscal balances. These results differ dramatically from those estimated in (1) where this probability was measured with error ($change_{i,t} = ptrans_{i,t}^* + \mu_{i,t}$) leading to the conclusion that probabilistic expected time horizons *do* in fact have a significant effect on fiscal performance. Regarding the magnitude of this effect, the correlation between $\varepsilon_{i,t}$ and $\mu_{i,t}$ suggests that, as expected, the direction of the bias on the binary executive transition indicator in (1) was positive ($\tau > 0$) and significantly different from zero at conventional confidence levels. The magnitude of this effect (1.73 % higher deficits for executives who know with certainty that they will not remain in office) differs dramatically from those obtained using an IV approach (between 0.72% and 0.74% higher deficits) due to the fact that the Endogenous Treatment Effects estimator explicitly takes into account the correlation between equations (14) and (16) while IV seeks to find instruments which overcome this correlation. All three estimators suggest that planning horizons are in fact endogenous and an over identification test confirms the validity of our excluded instruments using both TSLS-IV and GMM-IV estimators.⁵³

Figure 29 shows the predicted within-country relationship between the unobserved probability of an executive transition and fiscal performance measured as central governments surplus/deficit as a percentage of GDP. All three estimators predict a significant correlation between the likelihood of remaining in office and fiscal balances, the magnitude of which ranges between an expected difference of 0.72% of GDP to 1.73% of GDP between policymakers who expect to remain in office with certainty relative to policymakers who fully expect to lose power.

⁵³Sargan Statistic =2.54 (p=0.008) for both TSLS-IV and GMM-IV

Figure 29: Predicted Effects of Expected Horizons on Fiscal Performance



10 Myopia of the Masses?

While the above estimates account for measurement error associated with using a binary indicator of executive transitions, there still remains the possibility that fiscal performance affects chances of re-election (Dewan and Myatt 2010). In the case of non-myopic voters (with full information), we would expect responsible fiscal outcomes to improve an incumbents chances of re-election; whereas in the case of myopic voters (or in the case of asymmetric information) we would expect policymakers to use deficits to finance a successful election campaign. (Milesi-Ferretti and Spolaore 1994) In order to get a better idea of whether deficit spending is used as an effective tool for re-election, I begin by fitting a hazard rate model for executive turnover containing only information which incumbents would have access to in the year prior to a transition of power (i.e. all economic variables are lagged two periods). I specify a random intercept logistic equation as:

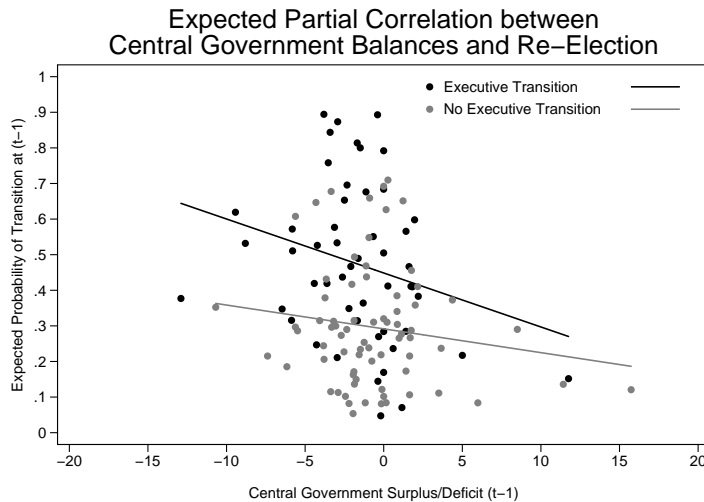
$$Pr(q_{i,t} = 1 | q_{i,t} \geq q_{i,t-1}; \mathbf{B}'\mathbf{X}_{i,t-j}, f(t), \zeta_i) = \frac{1}{1 + e^{-(\mathbf{X}_{i,t-j}\mathbf{B} + f(t) + \zeta_i)}} \quad (j = 0, 1, 2) \quad (18)$$

Where $\zeta_i \sim N(0, \psi)$ is estimated via adaptive quadrature, and, \mathbf{X} contains all of the political and economic information available to the incumbent at the *beginning* of period t . The political factors at time t are years of election, government fractionalization, the number of parties

in government, and executive polarization. While aware of the relatively constant political landscape, incumbents can only be expected to have access to information regarding economic performance for years prior to t so these covariates (GDP growth, unemployment, inflation, debt service costs and cash balances) are lagged by one and two periods ($t - 1$ and $t - 2$). Lastly, I specify a time effect using the natural log of the number of years that the executive has been in office $f(t) = \ln(tio)$.

Isolating only the years where an election took place in the sample of 61 states⁵⁴, I first plot the *perceived* relationship between the probability of being re-elected and fiscal performance (deficit/surplus) based on information at the beginning of the election year. Figure 30 shows the expected relationship between the probabilities of remaining in office and central government surplus/deficits from equation (18). I separate incumbents who remained in office from unsuccessful ones with the black dots represent an observed executive transition in time t , while the gray dots represent an incumbent victory. In both cases there is a significant negative partial correlation between the perceived likelihood of leaving office and the accumulation of debt, implying that large deficits may damper the perceived likelihood of re-election.

Figure 30: Partial Correlation: Fiscal Balances and Expected Likelihood of Re-Election



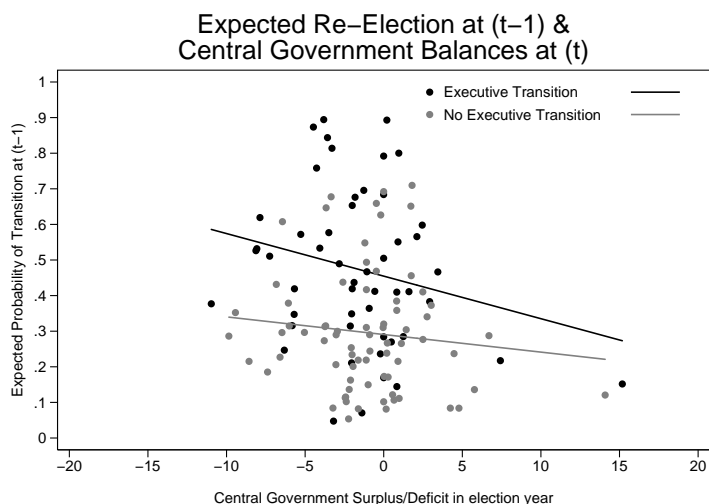
From Figure 30, it appears that perceptions of re-electoral victory are partially a function of their level of fiscal discipline in the year prior to elections taking place, suggesting that voters

⁵⁴Of the 634 country-year observations, elections took place in about 21% of these (134), and, in about 42% (56) of these election years there was a turnover of the executive.

are non-myopic, prefer an economically responsible government, and are not fooled by short run gains from electoral spending exigencies to win them over.

Figure 31 shows the estimated probability of an executive transition from equation (18) and plot it against observed central government's cash balances for the year of the election (t) which were not included in equation (18). Essentially, this is the incumbents fiscal reaction to the information possessed at time $t - 1$. Again, the black dots represent an executive turnover in t , while the gray dots represent an incumbent victory. We can see that incumbents react, in year t , in a similar manner as predicted in Figure 30 with incumbents who perceive a lower likelihood of remaining in office incurring larger levels of deficits. This correlation suggests that incumbents are aware of the negative relationship between fiscal performance (cash balances) and the likelihood of remaining in office with relatively safe executives running higher surpluses/lower deficits than those who are relatively unsafe.

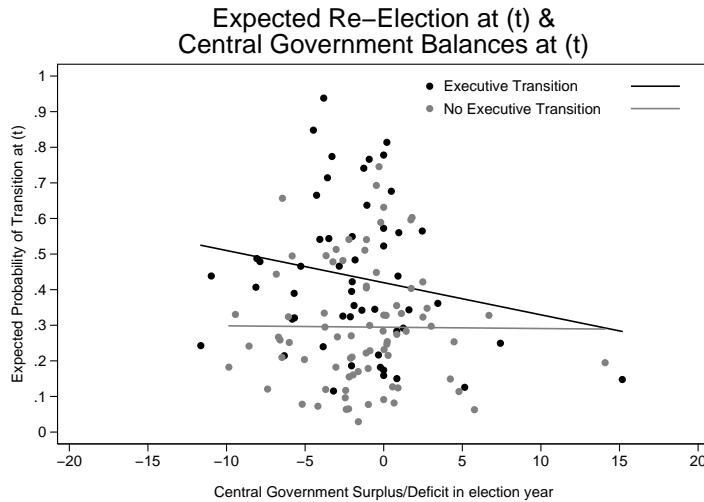
Figure 31: Election year Fiscal Balances and Likelihood of Re-Election at time ($t - 1$)



Because the estimates from equation (18) and the relationship in Figures 30 and 31 are based on economic information from previous periods, these do not take into account the economic climate in the year of the election which will likely have a significant effect on the likelihood of incumbent victory if voters are non-myopic. I run the same specification as in (18) with the inclusion of economic information at time t . Controlling for other economic factors in the election year (growth, inflation, unemployment, and debt service costs), these 'updated' probabilities are plotted against cash balances in Figure 32. Much like the findings in Figures

30 and 31, there appears to be a negative (or at best neutral) association between cash balances and the likelihood of an executive transition.

Figure 32: Expected Probability of Executive Transition and Fiscal Performance at time t



The general implications of these preliminary findings suggests that voters are well informed and non-myopic when it comes to selecting future governments. Fiscal irresponsibility appears to be punished with higher probabilities of an executive turnover and this relationship should be well known to candidates before they form fiscal policy at the beginning of the election year. These results give further validation to those found in Figure 30 where a low perceived probability of re-election leads incumbents to neglect future consequences of their fiscal decisions.

11 Discussion

A long line of literature has now confirmed that fiscal performance is jointly determined by a combination of economic factors, such as economic growth, unemployment rates and debt service costs (tax smoothing), and; political factors, such as the number of veto players in the budgeting process, the degree to which policymakers internalize the total burden of generating additional revenues, and expected time horizons of policymakers. The within-country estimates find evidence that as the number of parties in government increases, there exists lower levels of year-on-year fiscal flexibility as predicted by veto player theory, confirming the results in Chang and Tsebellis (2004) and Franzese (2005). Less evidence is found supporting the common pool problem where the 'Law of $1/N$ ' predicts that, as the number of actors in the formation of fiscal

policy increases, so too should government expenditures. If we assume no unpopular spending increases, this will also lead to fiscal imbalances as policymakers fail to fully internalize the full costs of generating an additional unit of revenue. The insignificant effect of cabinet size runs contradictory to those found in past research (Franzese 2005; Wehner 2010), which is potentially explainable by a less than perfect measure taken from the Banks Cross National Time Series database which does not consider the distribution of power within cabinet. In order to confidently reject the common pool hypothesis would require a better measure of the number of meaningful actors in the budget formulation process (such as that in Wehner 2010 or those provided in IMF-GFSY Institutional Tables), rather than a raw measure of the number of actors listed in cabinet (those without independent responsibility for a specific portfolio).

With respect to probabilistic planning horizons, the small number of empirical contributions to date has consistently estimated a significantly higher level of fiscal indiscipline from incumbent policymakers with a lower expected likelihood of remaining in office. (Edwards and Tabellini 1991; Debrun and Kumar 2007) Past research in this area has been constrained by the fact that probabilistic regime transitions are unobserved. There is also a potential endogeneity problem associated with expected planning horizons. The lack of real world cases where exogenous fixed term limits exist at the national level has forced researchers to rely instead on proxy measures of expected time horizons. The results above, which take into account this endogeneity problem, validate these findings from both an Endogenous Treatment Effects and IV approach suggesting that fiscal indiscipline is *at least* as much a function of how heavily governments discount the future as the institutional setting under which they formulate fiscal policy. There is also little evidence supporting voter myopia where incumbents use expansive fiscal policy to increase their chances of re-election. The consistency of findings across empirical tests of the 'discount rate' effect from finite planning policymakers on fiscal outcomes raises interesting questions regarding potential remedies for a problem which is directly correlated with a fundamental feature of modern democratic systems. A solution must come from within the constitutional boundaries of electoral uncertainty and cannot be rectified by concentrating power in the hands of a small number of policymakers as was the case with veto player and common pool problems. Another popular avenue for rectifying problems associated with inefficient policy-making is the creation of explicit budget rules which constrain the choice set of policymakers but such a rule would be lack credibility in any case where an executive in time t does not discount any of the repercussions of his/her fiscal decisions for time $t + 1$.

12 Conclusion

The historically recent and widespread movement away from neoclassical towards Keynesian macroeconomic ideology has led to a greater degree of flexibility for policymakers to justify the accumulation of fiscal imbalances. Persistence negative imbalances since the 1970's has led the academic community to search for the cause, as well as institutional remedies to improving fiscal discipline and create structure induced socially optimal outcomes. Evidence is found supporting Barro's tax smoothing hypothesis where distortionary burdens are minimized over time with pro and counter-cyclical stabilizers, as well as, the veto player hypothesis which predicts that the number of actors in the budget formulation process will significantly impact the degree of year-on-year flexibility which policymakers possess to make fiscal adjustments. While a considerable amount of literature has been devoted to these distortionary political effects generated by veto player and common pool problems in generating sub-optimal fiscal outcomes, much less emphasis has been given to the planning horizons of policymakers.

Theoretical contributions have predicted that policymakers who heavily discount the future will fail to internalize any increases in debt which they can pass off to future administrations, effectively constraining their policy choice set. The empirical validity of these theoretical expectations has, however, been given limited empirical attention due to the difficulties associated with measuring the unobserved discount factors of policymakers and the potential for reverse causality. Characterizing these discount factor, or the likelihood of remaining in office, as a binary indicator of success or failure fails to recognize that incumbents evaluate their chances of remaining in office *probabilistically*, rather than knowing with certainty. Consistent with these theoretical expectations, this paper finds that as the unobserved expected probability of policymakers remaining in office decreases, so to does the level with which they internalize the future burdens of fiscal imbalances, to the extent that incumbent who know with certainty in time t that they will no longer be in office in time $t + 1$ will generate between 0.72% and 1.73% higher fiscal deficits (as a % of GDP) in their final year in power than those who know with certainty that they will remain in office (*ceteris paribus*). The evidence also suggests that these fiscal imbalances cannot be (and are not) used to win elections.

The general findings suggest that institutional structure, as well as the objective functions of policymakers, *do* play a significant role in determining fiscal outcomes. While institutional problems can be resolved by concentrating power in a small number of ideologically homogeneous actors who fully internalize the costs of their budgetary decisions, the problem of uncertain tenure strikes deeper at the heart of the constitutional framework under which these actors function. The goal then is to devise a mechanism within the institutional bounds of a democratic system which overcomes a problem directly associated with its core.

Part IV

Endogenous Budget Rules?

Abstract

The recent popularity of central government budget rules has led to their internationally widespread adoption over the 1990-2008 period. The existence of such a trend provides a rare and unprecedented opportunity for examining within country budget rule effectiveness, as well as testing for the potential endogeneity problem, where rule adoption may be determined within equations of fiscal performance. Using an event history analysis framework, this paper provides strong evidence supporting the hypothesis that profligate governments are less likely to adopt rules which constrain their discretionary budgeting power. There is, however, some evidence of a second order effect from the adoption of budget rules where their adoption may help to preserve periods of fiscal consolidation. The finding of budget rule endogeneity raises questions about past estimates of the conditional efficacy of these rules where they may be more appropriately characterized as second order, rather than direct, predictor of fiscal outcomes.

13 Introduction

Since the early 1970's, persistent central government deficits have led researchers to explore the cause of these unsustainable imbalances. One avenue that has received increasing attention in public finance literature is the role and objectives of policymakers who may use their discretionary fiscal power to maximize individual, rather than social, utility. In order to overcome the problems associated with increasing the discretionary budgeting power of policymakers, the adoption of budget rules and constitutional constraints has become a popular device for counteracting an existing deficit bias and achieving greater levels of fiscal responsibility. (Von Hagen and Harden 1995; Poterba 1996; Alesina et al. 1999; Volkerink and De Haan 2001; Hallerberg et al. 2007; International Monetary Fund 2009; Wehner 2010) Empirical evidence thus far has predominantly verified a cross-national correlation between unobserved fiscal rules indices and macroeconomic performance, but has been subject to a limited number of tests for within-country effects due to data limitations and the invariance of institutions over short time periods. The fact that any of these findings have been validated with static or pooled cross-sections makes them subject to potential omitted variable biases commonly found in cross national studies, nor is there any indication of how well specific rules function rather than the

more popular composite indices which mask the effects of individual institutional features that make up these indices.

In studies which have considered the within-country effects of budget rules, there is also a commonly neglected potential endogeneity problem where profligate policymakers may be less likely to adopt, or comply with, rules which limit their discretionary budgeting power. This would result in responsible policymakers adopting rules which are intended to constrain them to act responsibly, with the rules themselves potentially having no *real* first order effect. (Kumar and Debrun 2007) In this case, past cross-sectional or within-country estimates of the effectiveness of fiscal rules may reflect the unobserved reluctance of irresponsible governments to adopt, or comply with, such rules rather than the efficacy of the rules themselves.

The unprecedented number of countries who have adopted executive budget rules over the 1990-2008 period allows for a rare opportunity to test for this possibility. Using an event history analysis approach, this paper examines the effects of economic and political characteristics of the state which may influence the likelihood of budget rule adoption in a globally representative sample of between 34 and 39 countries. The results suggest that the adoption of fiscal rules are highly influenced by past movements in primary balances and levels of inflation, but there does not appear to be any political effects beyond that of election years which increase the likelihood of fiscal rule adoption. Finding evidence to support the hypothesis that profligate, or fiscally irresponsible, governments are less likely to adopt budget rules, this paper concludes with some informal non-parametric evidence for the within-country efficacy of three specific fiscal rules (Expenditure, Debt, and Balanced Budget) adopted by central governments over the 1990-2008 period.

Part 1 of this paper will provide a brief overview of the reasons which necessitate the existence of budget rules. Part 2 will provide an overview of the data as well as test for potential factors which may affect the likelihood of adopting a fiscal rule within countries. Finding strong evidence that governments who are in the midst of a period of successful fiscal consolidation are more likely to adopt budget rules, part 3 firstly provides parametric results which ignore this endogeneity problem, and, concludes with an informal non-parametric analysis of the 'real' effects of budget rules. Part 4 will discuss the implications of the results, and Part 5 will conclude.

13.1 Why Do We Need Budget Rules?

Budget Institutions can be defined as “all the rules and regulations according to which budgets are drafted, approved and implemented.” (Alesina *et al* 1999) Breaking the budget process down

into these three distinct stages has allowed for a closer evaluation of the procedural difficulties, or “co-ordination failures” which exist at each stage. (Fabrizio and Mody 2006; Hallerberg et al. 2007; Hallerberg et al. 2009) From a political perspective, several theories have stood the test of time in the political economy literature relating to the first two. The common pool problem emphasizes the number of actors who have a meaningful input in the drafting and approval of the budget where larger numbers of individuals involved in each stage leads to sub-optimal fiscal outcomes as they fail to internalize the distortionary burdens, or costs, associated with increased expenditures. From this perspective, we should expect that, in the drafting stage, the size of cabinet, number of parties, and degree of ideological polarization within government, to contribute to the level at which distortionary burdens are internalized which are subsequently translated into fiscal outcomes (Weingast, Shepsle and Johnsen 1981; Von Hagen and Harden 1994; Franzese 1995; Von Hagen 2005). In the approval stage, the size of the legislature, as well as the degree of power they possess in amending the budget, should be expected to influence fiscal outcomes. (Wehner 2010). At the implementation stage, transparency of the budget process makes it possible for policymakers to use creative accounting for circumventing any formal constraints imposed on them in the first two stages. (Milesi-Ferretti 2004; Alesina 1996)

A recently popular solution to the deficit bias problem is the creation of binding rules on the budgeting process which constrains discretionary power of policymakers. The difficulty, however, comes with finding rules which have *real* effects on fiscal outcomes rather than token or ‘ornamental’ measures to improve perceptions or rankings in national indices. (Poterba 1996; Hallerberg et al. 2007; Kopits 2001) One credible solution to the common pool resource problem (‘Law of $1/N$ ’) is the concentration of budgeting powers in the hands of a single actor (generally, the finance minister) who is assumed to fully internalize the full distortionary costs of the budget (i.e. setting $N = 1$), or; in the case of the second stage, limiting the amendment powers of the legislature. This form of ‘hierarchical’ budgeting has been shown to improve fiscal performance measured in terms of primary deficits using additive indices of fiscal rules. (Von Hagen 1992; Von Hagen and Harden 1994; Alesina et al 1999; Wehner 2010⁵⁵). Hallerberg et al. (2007) builds on this framework, suggesting that the appropriateness of fiscal rules is conditional on the number of parties involved in the budget process. Stringent budget rules are only found to be necessary in “dispersed government coalitions, whereas delegation is effective only in states with single party governments or closely aligned coalitions.” (Hallerberg and Von Hagen 1999; Hallerberg et al. 2007)

While these contributions have been predominantly concerned with procedural constraints at different stages of the budget process, the primary focus of this paper will be on four overar-

⁵⁵Wehner 2010 looks at the effects of specific amendment rules as opposed to using a composite index

ching rules which are meant to govern fiscal *outcomes*, independent of the process under which they are formulated, approved, and implemented. In this sense, budget rules can be seen as those which set explicit targets that are directly tied to fiscal outcomes, rather than procedural constraints designed to implicitly induce optimal performance. The downfall to setting these explicit numerical targets, rather than procedural constraints, is the inability of policymakers to react to dynamic volatility or economic cycles (tax smoothing) suggesting that tight fiscal rules may produce dynamically sub-optimal fiscal outcomes (Poterba 1995; Alesina and Perotti 1996; Kopits 2001; Von Hagen 2005) In this case, budget rules which lack some degree of short run policymaker flexibility may result in less, as opposed to more, macroeconomic stability over time. However, given that these rules have explicitly defined targets, it is much easier to assess their efficacy, or is it?

The empirical evidence regarding the effectiveness of such budget rules, thus far, could be characterized as cautiously optimistic. While evidence has been found suggesting that self imposed numerical targets *do*, in fact, produce real fiscal outcomes (Poterba 1995; Bohn and Inman 1995; Corsetti 1996), there remains at least two directly unobservable factors which may distort these findings. Firstly, fiscal intransparency may allow policymakers to adopt budget rules, yet, through the use of creative accounting, avoid complying with them. In this case, budget rules may induce untransparent behavior, as governments who desire higher rankings in international indices or a credible reputation with taxpayers, may adopt rules, yet incur no real costs in terms of loss of discretionary fiscal power. (Milesi-Ferretti 2004) There exists a long line of literature suggesting that any credible adoption of fiscal rules must be complimented by a sufficient level of transparency to assess the efficacy of that rule. (Alesina 1996; Poterba 1999)

Secondly, it is possible that the creation of, or level of compliance with, fiscal rules is itself a function of past economic performance. In this case it is possible that “policy credibility is formed regardless of actual adherence to rules”, and a “reputation of prudent macroeconomic management [can be] acquired through a prolonged period of good performance”, independent of the existence of fiscal rules. (Kopits 2001) Although the issue of budget rule endogeneity has been explicitly noted in past literature, it has been assumed away on the grounds of high adoption costs and complexity in the short and medium run (Alesina and Perotti 1996; Alesina et al. 1999) If it is the case that the likelihood of rule adoption, or compliance with pre-existing rules, is a partial function of past macroeconomic performance, the ‘true’ effect of these rules becomes difficult to identify. Furthermore, the assumption of exogeneity, found in almost all past statistical validations of fiscal rule effectiveness, would lead to upwardly biased parameter estimates capturing the effect of responsible government rather than, or along with, the actual effect of the rule itself. In this sense, these rules may perhaps be better seen as second order

determinants which confer credibility by signaling the removal of discretionary intervention.

In short, existing structures of the budget process which foster fiscal indiscipline of policymakers can be counterbalanced with rules that constrain their actions. A growing line of literature on the budget process has addressed and validated potential solutions, both empirically and theoretically, with a great deal of support backing the creation of hierarchical (or conditionally hierarchical) and centralized budgeting rules which structurally induce optimal fiscal outcomes. An additional option to procedural constraints is the creation of rules which impose explicit numerical targets on fiscal outcomes. These have the ability to impose directly observable constraints, but may produce sub-optimal results if there is insufficient flexibility or a lack of transparency regarding the degree to which policymakers abide by these rules. There is also a possibility that rules themselves are determined within the equation of fiscal performance making it difficult to identify the 'true' effects of budget rules which may be better characterized as second order reinforcement mechanisms.

14 Fiscal Rule Adoption

Although a great deal of literature has been devoted to examining the effectiveness of fiscal rules, much less work has been done on the circumstances under which these rules are adopted. Given the large number of countries who adopted fiscal rules over the 1990-2008 period (see Figure 1), it is possible, for the first time, within a large sample of states, to examine the context under which these rules are adopted, effectively testing for fiscal rule endogeneity.

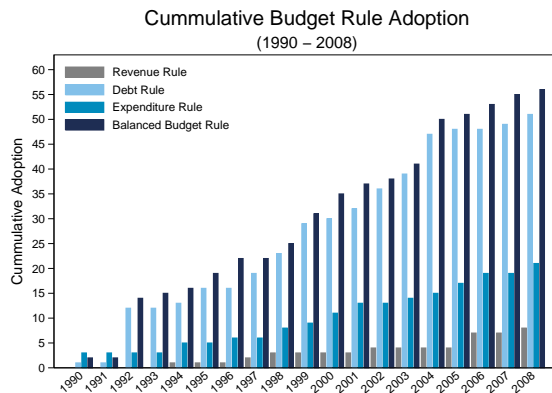
14.1 The Data

Throughout the mid 1990's to mid 2000's, an unprecedented number of governments embraced the adoption of national budgeting rules. The newly created IMF 'Fiscal Rules Database'⁵⁶ contains information on four types of rules adopted at intra or inter-national levels, applying to either general or central governments:

- The *Budget Balance Rule* can be applied to overall balances, structural or cyclically adjusted balance, and balance over the cycle to help ensure the debt-to-GDP ratio converges to a finite level.
- The *Debt Rule* sets an explicit limit or target for public debt as a percentage of GDP. This type of rule is, by definition, the most effective in terms of ensuring convergence to a debt target. The downfall to the debt rule is that it does not provide sufficient guidance for fiscal policy when debt is below its ceiling.

⁵⁶IMF's 'Fiscal Rules: Anchoring Expectations for Sustainable Public Finance' (2009)

Figure 33: Cumulative Adoption of Budget Rules



- The *Expenditure Rule* sets permanent limits on total, primary, or current spending in absolute terms, growth rates, or as a percentage of GDP. These rules are not directly linked to debt sustainability since they do not explicitly constrain the revenue side. They can provide, however, “an operational tool to trigger the required fiscal consolidation consistent with sustainability when they are accompanied by debt or budget balance rules.” (IMF 2009)
- The *Revenue Rule* set ceilings or floors on revenues and are aimed at boosting revenue collection and/or preventing an excessive tax burden. These rules are, again, not directly linked to the control of public debt, as they do not explicitly constrain expenditures.

Figure 33 shows the cumulative adoption of these four rules over the 1990-2008 period. By the end of this sample period, a total of eight countries had adopted revenue rules, twenty-one had adopted expenditure rules, fifty-one had adopted debt rules and fifty-six had adopted budget balance rules. A full list of these countries and the years of adoption is provided in Appendix C.

Budget Rules data was manually coded by the author using the International Monetary Fund’s Fiscal Rules Database⁵⁷ All other government finance data for consolidated central government was taken from the International Monetary Funds Government Finance Statistics Yearbook (GFSY) for the years 1990-2008. While it is possible that policymakers might assess their overall fiscal balances (including interest), I assume that they only take into account fiscal per-

⁵⁷(This data is found in the Appendix of the IMF’s ‘Fiscal Rules: Anchoring Expectations for Sustainable Public Finance’ (2009)

formance which they have discretionary power over, hence use primary balances as a dependent variable. For example, if there is an unexpected increase in interest rates which significantly decreased overall balances, these governments would have to engage in unpopular adjustments of revenues or expenses accordingly in order to be able to comply with the rule they adopted. Data on cabinet size, which provides a proxy for the common pool problem, was taken from Banks Cross National Time Series data set (2010). Executive ideology is classified into one of three categories of left right and center for the largest party in government based on the Database of Political Institutions (DPI) classification.⁵⁸ Government polarization is also taken from DPI but recoded as the maximum distance (using the left, center, right classification) between the executive party and the two other largest parties in government. Summary statistics for all of the data is provided in Table 1 below.

15 Are Profligate Governments Less Likely to Adopt Fiscal Rules?

The assumption of budget rule exogeneity in the short to medium term does not explain whether fiscal circumstances have a causal relationship with the likelihood of adopting fiscal rules when they actually *are* adopted. The idea that “intrinsically profligate governments would be reluctant to adopt or maintain constraining fiscal arrangements, while fiscally conservative governments are more prone to do so” suggests that fiscally responsible governments may be more likely to adopt rules that require them to be fiscally responsible (Debrun and Kumar 2007).

In a sample of eighteen EU states over the 1990-2004 period, Debrun and Kumar find evidence that movements in their fiscal rules index were significantly correlated (at conventional levels) with movements in economic and political circumstances within states, providing evidence that the adoption of fiscal rules is partly determined by fiscal performance. Specifically, they find that government fragmentation has a significant positive effect on the fiscal rules index, supporting Hallerberg *et al*'s commitment approach for coalition governments. Right wing governments are found to be significantly less likely to self impose fiscal constraints and, governments with higher cyclically adjusted primary balances (CAPB) are more likely to increase their fiscal rules index score, giving some support to the idea that responsible governments adopt fiscal rules rather than fiscal rules creating responsible governments. Instrumenting the fiscal rules index with fragmentation, ideology, and dummy variables for the Stability and Growth Pact, the run-up to EMU, the delegation form of fiscal governance, a linear time trend, and a fiscal

⁵⁸World Bank - Database of Political Institutions (2009)

Table 7: Summary Statistics

Variables	Mean (s.d.)	Min	Max
<i>Central Government Primary Balances</i>	1.58 (3.24)	-9.44	19.73
<i>Inflation (CPI)</i>	10.08 (52.64)	-13.13	1058.37
<i>Unemployment</i>	8.64 (4.28)	1.5	23.90
<i>Debt Service Costs</i>	3.22 (9.81)	-64.55	86.51
<i>Trade (% GDP)</i>	86.87 (46.02)	15.87	224.50
<i>Dominant Left Executive Polarization</i>	0.39 (0.69)	0	1
<i>Cabinet Size</i>	20.68 (7.01)	9	68
<i>Parties in Government</i>	2.60 (1.89)	1	16
<i>Effective Number of Parties in Government</i>	1.75 (0.85)	1	3.96
<i>Government Fractionalization</i>	0.33 (0.28)	0	0.89
<i>Election Year</i>	0.26	0	1
<i>Budget Balance Rule</i>	0.52	0	1
<i>Expenditure Rule</i>	0.26*	0	1
<i>Revenue Rule</i>	0.20	0	1
<i>Debt Rule</i>	0.20*	0	1
	0.05	0	1
	0.05*	0	1
	0.46	0	1
	0.16*	0	1

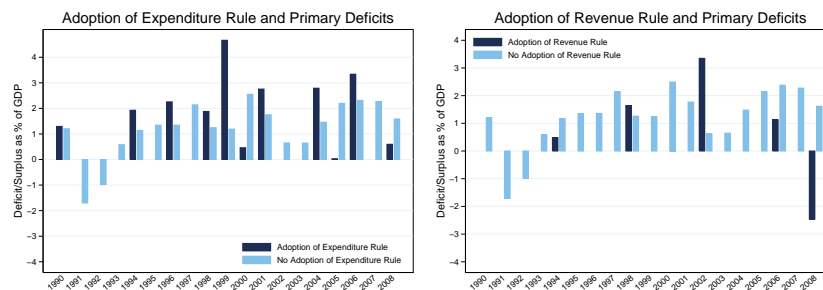
*- Adopted at National Level (not supra)

council index score, they find that both the restrictiveness and coverage of budget rules have no statistically meaningful impact on CAPB concluding that budget rules have no *real* effect on central government deficits. (Debrun and Kumar 2007)

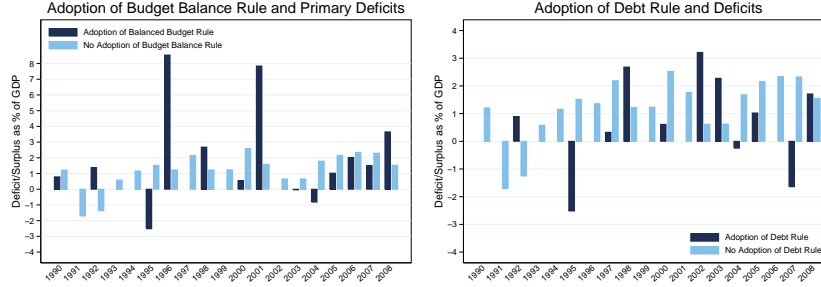
Lastly, the IMF “Fiscal Rules: Anchoring Expectations for Sustainable Public Finance” (2009) finds strong evidence from a conditional ‘fixed effects’ binary logistic specification that fiscal performance has a significant effect on the likelihood of adoption; mainly, those countries who experienced past years of successful fiscal consolidation (reduction of public debt ratio by two percentage points) were found to be twice as likely to adopt a rule compared with countries who had not consolidated. They conclude that prior consolidation adds credibility to the rules, signaling “the authorities’ commitment to undertake the requisite measures to put the budgetary situation on a sustainable footing.” (IMF 2009) These results, along with those found in Debrun and Kumar, suggest that the decisions to adopt fiscal rules is not a random one, with fiscally conservative governments being more likely to adopt. Taking into account this non-randomness, the effectiveness of rules becomes either indistinguishable from zero or a second order enforcement mechanism to preserve a period of successful consolidation.

Some preliminary evidence is provided below in Figure 34 which shows the relationship between adoption of deficit rules, balanced budget rules, revenue rules and expenditure rules (respectively) and a country’s primary surplus/deficit⁵⁹ in the year of adoption (dark bars) relative to those countries who did not adopt a fiscal rule (light bars). The preliminary evidence does not give any strong indication of endogeneity, although there is some evidence that countries running large primary surplus’s might tend to favor adoption of a budget balance rule.

Figure 34: Primary Balances at the time of Adoption



⁵⁹For country-years where reporting is on an accrual, rather than cash, basis, net lending/borrowing is used.



15.1 Estimation

This paper takes on a slightly different approach to that used by Debrun and Kumar (2007) and the IMF Fiscal Rules Report (2009) to test for the endogeneity of budget rules. Firstly, rather than using a continuous and unobservable index of fiscal rules (Debrun and Kumar), I instead look at the 'event' of adopting specific rules restricting the sample to countries for which there exists central government public finance data at least two years prior to adopting a fiscal rule so that there is sufficient (in a minimalistic sense) information to be able to compare within-country fiscal circumstances in adoption years with non-adoption years. Secondly, while the *IMF* Fiscal Rules Report fits a conditional logistic ('fixed effects') specification to estimate the unobserved prevalence of adoption, this paper is interested in the the *incidence* rather than *prevalence* of adoption (see King and Zeng 2001). This is to say that IMF 2009 looks at the difference in macroeconomic performance in years where a budget rule exists versus years where it does not, whereas this paper looks at what macroeconomic indicators help explain the event of adoption itself. Therefore, countries who have adopted in year t are dropped out of the sample for all remaining years ($t + 1, t + 2, \dots$) which is not possible using a conditional logistic specification. Countries who fail to adopt a specific rule are kept in the sample for the entire sampling period which is not possible to model using a conditional logistic specification. I also expand beyond the IMF-Fiscal Rules Report's list of economic variables to include potential institutional/political factors which may influence the decision to adopt budget rules.

Using discrete annual time periods, the hazard probability of adoption can be defined as:

$$\lambda(t|\mathbf{X}_{i,t}, f(t)) = p(y_{i,t} = 1 | y_{i,t} \geq y_{i,t-1}; \mathbf{B}'\mathbf{X}_{i,t-j}, f(t)) = \frac{1}{1 + e^{-(\mathbf{X}_{i,t}\mathbf{B} + f(t))}} \quad (19)$$

Where $\mathbf{X}_{i,t}$ contains,

$primsurpl_{i,t}$ is the primary surplus/deficit as a percentage of GDP in country i at time t

$(primsurpl_{i,t-j} - primsurpl_{i,t-(j+1)})$, ($j = 0, 1$) is the change in primary balances in country i for period t and $t - 1$

$right_{i,t}$ is a dummy variable for ideologically right wing executives in country i at time t

$enop_{i,t}$ is the effective number of parties in country i at time t ⁶⁰

$polar_{i,t}$ is the degree of ideological polarization in the executive of country i at time t ⁶¹

$cabsize_{i,t}$ is the size of the cabinet in in country i at time t

$infl_{i,t}$ is the rate of inflation (CPI) in country i at time t

$grwth_{i,t}$ is the GDP growth rate in country i at time t

$unempl_{i,t}$ is the rate of unemployment in country i at time t

$debtstv_{i,t}$ is the debt service cost in country i at time t

There are several ways of characterizing time $f(t)$, ranging from the least restrictive dummy variable approach to a much more restrictive linear scale (see Beck et al 1998; Box, Seffensmeier and Jones 1997) I estimate several of these including dummy variables, logarithmic transformations, as well as linear and restricted cubic splines, finding that a simple two knot linear spline provides a good fit for a time effect.

Due to the small number of countries who adopted revenue rules, (see Figure 34) the specification in equation (19) is estimated separately for the adoption of expenditure, debt, and balanced budget rules across a sample of between 34 and 39 countries using a random intercept logistic approach. (Rabe-Hesketh and Skrondal 2005) The logistic transformation of both sides of equation (19) gives:

$$\lambda(t|\mathbf{X}_{i,t-j}, f(t), \zeta_i) = \ln \left[\frac{\lambda(t|\bullet)}{1 - \lambda(t|\bullet)} \right] = \delta f(t) + \mathbf{B}'\mathbf{X}_{i,t-j} + \zeta_i + \varepsilon_{i,t}$$

Where $\varepsilon_{i,t}$ follow a logistic distribution $\varepsilon_{i,t} \sim L(0, \pi^2/3)$ and ζ_i are country specific random intercepts estimated using adaptive quadrature. $\zeta_i \sim N(0, \psi)$

⁶⁰The Effective Number of Parties is computed as the inverse of the sum of squared seat shares of all parties in government.

⁶¹Polarization is measured as the greatest distance between ideological affiliation (Left, Center, Right) in the executive (data from WB-Database of Political Institutions)

15.2 Results

Table 8: Budget Rule Adoption (Odds-Ratios)

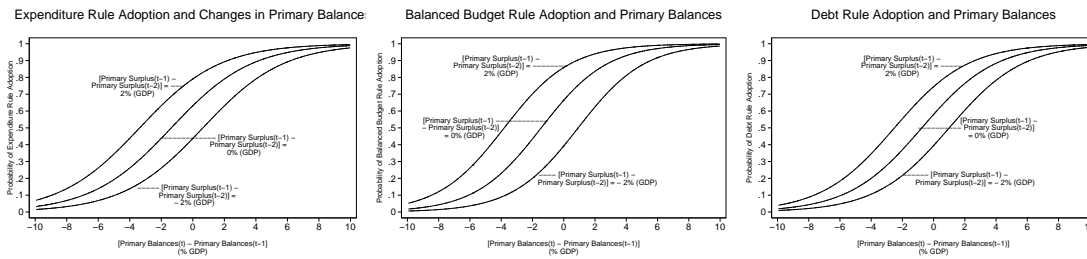
Variables	Expenditure Rule	Budget Balance Rule	Debt Rule
Primary Surplus (% GDP)	0.97 (0.10)	0.82* (0.08)	0.81** (0.07)
Δ Primary Surplus	1.48** (0.29)	1.61** (0.30)	1.53** (0.30)
Δ Primary Surplus (t-1)	1.48** (0.23)	1.75*** (0.31)	1.45** (0.25)
Inflation (CPI)	0.86* (0.07)	0.88* (0.06)	0.91* (0.05)
Unemployment	0.98 (0.08)	1.03 (0.06)	1.18** (0.08)
GDP growth (%)	1.13 (0.15)	0.84 (0.11)	0.91 (0.11)
Debt Service	1.18*** (0.07)	0.94 (0.06)	0.91 (0.05)
Election Year	1.47 (0.98)	3.65** (2.08)	1.23 (0.72)
Cabinet Size	0.96 (0.05)	1.01 (0.04)	0.97 (0.04)
Polarization	1.12 (0.61)	0.73 (0.39)	1.00 (0.47)
Dominant Right Executive	0.61 (0.42)	0.79 (0.44)	0.60 (0.34)
Effective number of parties in government	0.92 (0.39)	1.30 (0.42)	0.79 (0.27)
Spline 1 (1990-1995)	0.89 (0.55)	0.14*** (0.07)	0.25*** (0.11)
Spline 2 (1996-2001)	1.04 (0.22)	1.47** (0.29)	1.13 (0.21)
Spline 3 (2002-2006)	1.28 (0.32)	1.42 (0.33)	1.42 (0.33)
Observations	376	233	259
Countries	39	34	35

odds-ratio standard errors in parentheses

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

Consistent with past research, the results above suggest that the likelihood of adopting all three rules is significantly associated with past changes in fiscal performance. Countries who have experienced large positive increases in primary balances (as a % of GDP) for the past two years are much more likely to adopt expenditure, balanced budget, and debt rules. The magnitude of this effect is between a 48% and 61% greater probability of adopting a fiscal rule given a one percentage point increase in year on year changes in primary balances between t and $t - 1$ (as % of GDP), and, between 45% and 75% greater probability given a one percentage point increase between $t - 1$ and $t - 2$ (*ceteris paribus*). This relationship is shown in Figure 3 which predicts the likelihood of adoption across changes in primary deficits between the year leading up to fiscal rule adoption ($primsurpl_{i,t-1} - primsurpl_{i,t-2} = 0$). Because the likelihood of adoption is significantly influenced by changes in fiscal performance for two periods, I depict three scenarios below in Figure 35. The first is a positive 2% change in primary balances between year $(t - 1)$ and year $(t - 2)$ which gives these countries additional fiscal inertia increasing the likelihood of adoption greater. The second, is no lagged changes in primary balances ($primsurpl_{i,t-1} - primsurpl_{i,t-2} = 0$); and, the third is a negative 2% change in primary balances between year $(t - 1)$ and year $(t - 2)$ as a percentage of GDP.

Figure 35: Probability of Fiscal Rule Adoption and Changes in Primary Balances



The marginal effects depicted in Figure 35 indicated that the probability of budget rule adoption for all three rules, is highly influenced by the fiscal performance of government over the past two years. As can be seen by moving along the x-axis (primary balances), countries who are experiencing a period of successful fiscal consolidation (improvements on the primary balances) are much more likely to adopt expenditure, budget balance, and debt rules. This effect is heightened in countries who have improved fiscal balances for the year prior to adoption as can be seen by comparing countries who have run a two percent (of GDP) surplus in year $(t-1)$, relative to those who have run a two percent deficit. This shows that, for countries who are experiencing a period of positive fiscal adjustments which they believe are sustainable over time

are much more likely to adopt a budget rule, relative to those who are not. These findings run consistent with those found in both Kumar and Debrun, as well as the IMF-Fiscal Rules Report, where governments may use the adoption of these rules as a second order enforcement device to maintain the credibility of a period of fiscal consolidation. There is also evidence suggesting that governments experiencing high inflationary periods will be significantly less likely to adopt any of the three fiscal rules.⁶²

With respect to political factors, there is little evidence that cabinet size, executive polarization, the number of parties in government or the dominant ideology of the executive have any significant association with the likelihood of budget rule adoption. There is some evidence that governments may be more likely to adopt in an election year, especially in the case of the budget balance rule, which may be used to boost their perceived level of fiscal responsibility. Generally speaking, however, the adoption of budget rules seems to be predominantly a function of economic inertia with consistent positive year on year changes in primary balances leading to a significantly higher likelihood of adoption, and, high inflationary periods dampening this likelihood regardless of political factors. The fact that these rules are adopted in the midst of a period of successful consolidation leads to a question of whether these rules have any *real* effect beyond their ability to reinforce an already existing trend.⁶³

16 Budget Rule Effectiveness

Past large N empirical tests of fiscal rule effects have predominantly validated their effectiveness in counteracting fiscal deficits (Alesina et al. 1999; Poterba 1995; Wehner 2010). However many these have been limited to cross-national or pooled samples.⁶⁴ This problem raises “questions about the interpretation of the findings” (Poterba 1996). The fact that fiscal rules are created to increase macroeconomic performance *within* rather than *between* countries leaves two over-arching questions regarding these results. The first is the likely potential for omitted variable biases in cross-national studies. It is likely that there exist country specific characteristics which vary systematically across states as well as across fiscal outcomes that have been neglected in past specifications. The release of the IMF Fiscal Rules database in December of 2009 has made it possible to overcome the omitted variable bias by testing for within-country effects of specific budget rules rather than an unobserved index of fiscal institutions.

⁶²Due to the fact that some countries in the sample experienced periods of hyperinflation (see summary statistics), I re-run the analysis excluding these countries and get very similar results.

⁶³‘real’, in this sense, would indicate a direct, rather than second order indirect, effect.

⁶⁴Hallerberg et al. (2007) and Wehner (2010) - who was the first to find a significant multiplicative association between procedural constraints and fiscal outcomes *within* countries, being exceptions. There are also several within country analysis of state budget rules in the US (Poterba, 1995; Bohn and Inman, 1995; Corsetti 1996)

Secondly, finding evidence that governments who are in the midst of a period of successful consolidation are much more likely to adopt these rules raises questions about the direct effectiveness of the rules themselves. I begin by ignoring this endogeneity problem, as was done in the IMF report, running a fixed effects regression of central government primary balances with jackknifed standard errors on a set of covariates defined below, including dummy variables for country-years for which each of the four budget rules was in place to test for their within country efficacy. The specification also accounts for the effect of the unobserved probability of the executive remaining in office by running a IV - Two Stage Least Squares model where this probability is modeled as a function of election years and the number of years that the executive has been in office. (see Section 3). The first stage specification is:

$$ptrans_{i,t}^* = w_{i,t}v + \epsilon_{i,t} \quad (20)$$

Taking into account the standard errors in (20), the second stage model is defined as:

$$y_{i,t} = \alpha_i + \delta y_{i,t-1} + \lambda ptrans_{i,t}^* + \mathbf{P}_{i,t}\beta + \mathbf{X}_{i,t}\theta + \omega_{er}er_{i,t} + \omega_{rr}rr_{i,t} + \omega_{dr}dr_{i,t} + \omega_{bbr}bbr_{i,t} + \varepsilon_{i,t} \quad (21)$$

Where:

$y_{i,t}$ is the primary surplus/deficit as a percentage of GDP in country i at time t

\mathbf{P} is a matrix of political variables

\mathbf{X} is a matrix of economic variables

$ptrans_{i,t}$ is the unobserved probability of an executive transition in country i at time t from ()

$er_{i,t}$ is a dummy variable indicating whether country i had an expenditure rule in time t

$rr_{i,t}$ is a dummy variable indicating whether country i had an revenue rule in time t

$dr_{i,t}$ is a dummy variable indicating whether country i had an debt rule in time t

$bbr_{i,t}$ is a dummy variable indicating whether country i had an balanced budget rule in time t

$\beta, \theta, \lambda, \omega_q$ ($q = er, rr, dr, bbr$) are unknown parameters to be estimated

16.1 Results

Due to the fact that, where budget rules are adopted supra-nationally (i.e. Maastricht), there is less government discretion in their adoption, the results in Table 9 are divided into two categories. The first codes only those countries where budget rules were adopted at the national

level as having adopted them, and the second codes all countries who adopted budget rules (both nationally and supra-nationally).

Table 9: Determinants of Primary Balances (Fixed Effects with Jackknifed standard errors)

Variables	Primary Balances	Primary Balances
	(% GDP)	(% GDP)
	National	All
Primary Balances \((t-1)	0.61*** (0.07)	0.64*** (0.08)
Balanced Budget Rule	1.12** (0.49)	0.76 (0.52)
Revenue Rule	-0.32 (1.25)	-0.35 (1.27)
Expenditure Rule	0.91 (0.60)	0.99* (0.53)
Debt Rule	-0.36 (0.60)	-0.12 (0.53)
Dominant Left Executive	0.32 (0.29)	0.31 (0.29)
Polarization	-0.12 (0.29)	-0.15 (0.27)
Cabinet Size	-0.05* (0.02)	-0.04* (0.02)
GDP growth	0.20*** (0.06)	0.19*** (0.05)
Inflation (ln)	0.28* (0.16)	0.28* (0.15)
Unemployment	0.06 (0.05)	0.06 (0.05)
Debt Service Cost	-0.02 (0.02)	-0.03 (0.02)
Trade (% GDP)	-0.01 (0.01)	-0.01* (0.01)
Parties in Government	0.08 (0.12)	0.09 (0.12)
Government Frac	1.28 (0.82)	1.20 (0.81)
<i>ptrans*</i>	-0.93** (0.42)	-0.89** (0.41)
Constant	-0.16 (1.05)	-0.07 (1.07)
Observations	460	460
Number of cid	42	42

Standard errors in parentheses
*** p<0.01, ** p<0.05, * p<0.1

The results suggest that primary balances are highly determined by inertia from past balances and economic growth, to the extent that a one percent increase will, on average, generate a 0.2% GDP increase in primary balances. As for political factors, cabinet size seems to have a significant negative correlation with primary surplus's supporting the common pool literature where larger numbers of actors in the budget process should lead to sub-optimal fiscal outcomes through the famous Law of '1/N'. For each additional member of cabinet, the results predict that, on average, we should expect a 0.04% (of GDP) increase in fiscal deficits as policymakers fail to internalize the distortionary burdens of their fiscal decisions (Franzese 1995; Weingast, Shepsle and Johnsen 1981; Von Hagen and Harden 1994; Von Hagen 2005). There also appears to be evidence that executives who have a low (unobserved) likelihood of remaining in office in time $(t + 1)$ will generate higher deficits to the extent that an executive who knows with certainty that they will no longer be in office in the following year, will, on average, run between 0.89 and 0.93% (of GDP) higher deficits relative to those who know with certainty that they will remain in office (see Section 3). Lastly, ignoring the endogeneity of budget rules, there appears to be evidence that both expenditure and budget balance rules have a significant positive effect on fiscal performance. Countries who have adopted these rules, at the national or supranational levels, on average, should be expected to run about 1% higher surplus's (between 0.74% and 1.12% for budget balance; 0.91% and 0.99% for expenditure) than those who have not adopted these rules. These estimates are, however, inconsistent as they fail to take into account the fact that the adoption of rules themselves is partly determined within this equation.

To illustrate this problem, the results in Table 2 indicate that the existence of budget rules within countries is partly a function of changes in primary balances $a_{i,t} = f(y_{i,t} - y_{i,t-1})$, ($a = er, bbr, dr, rr$). By estimating the specification in equation (21), ignores this relationship.

Re-arranging the terms in equation (21) and taking into account the relationship between budget rule adoption and fiscal performance gives:

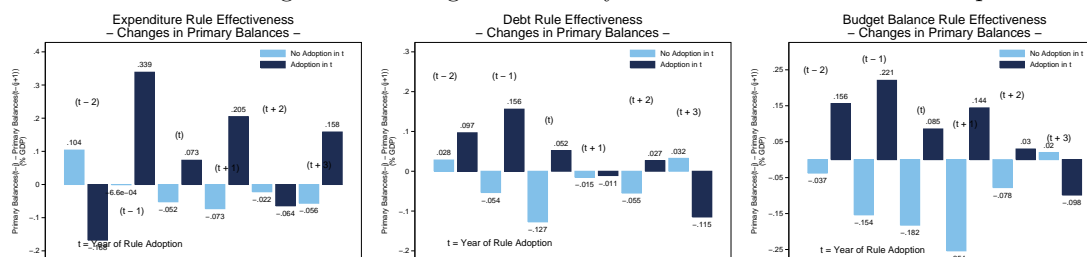
$$\begin{cases} y_{i,t} - \delta y_{i,t-1} = \alpha_i + \lambda ptrans_{i,t} * + \mathbf{P}_{i,t}\beta + \mathbf{X}_{i,t}\theta + \\ \qquad \qquad \qquad + \omega_a a(y_{i,t} - y_{i,t-1}) + \varepsilon_{i,t} ; (a = er, bbr, dr, rr) \end{cases} \quad (22)$$

Because the adoption of budget rules is partly determined within this system (i.e. is a function of first difference primary balances), these results do not produce consistent parameter estimates, nor do they allow us to identify any direct effect of fiscal rules $(\partial y_{i,t} / \partial \omega_a)$. Given a lack of viable instruments for budget rules with a global sample of countries, I approach the endogeneity problem conservatively with some preliminary non-parametrics, leaving a more formal test for the 'true' effect of budget rule adoption for future research.

If budget rules are to act as an enforcement mechanism or have any real effects on primary balances, we should expect that, after adoption, fiscal performance should either remain strong (second order) or improve (first order). Figure 36 plots the relationship between changes in primary balances for the run-up to, and after-effects of, the adoption of budget rules in countries who did adopt relative to countries who did not. The dark blue bars show the mean primary balances in the run-up to, and after the adoption of a budget rule while the light blue bars represent the mean primary balances in countries who did not adopt a budget rule for the five years covered. In all three scenarios there is strong evidence of the conditional relationship found in Table 9 where countries who adopted a budget rule in time t experienced strong fiscal performance in the two years leading up to the adoption, relative to countries who did not adopt. The after effects of having adopted these rules is less clear. Fiscal performance diminishes substantially, on average, in the first post-adoption year ($t + 1$) for countries who adopted expenditure rules, but out-performing non-adoption countries for the two following years. The same phenomenon occurs with the adoption of a debt rule where, in the first year after adoption, countries experience, on average, negative balances followed by two years of relatively strong fiscal performance. The most convincing evidence for a positive budget rule effect is found in the third graph of Figure 36 with countries who adopt budget balance rules showing consistently strong fiscal performance, running a primary surplus in the two years leading up to, as well as three years after adoption, relative to countries who did not adopt a budget balance rule.

The preliminary finding that a balance budget rule acts as an effective deterrent to the accumulation of large primary deficits has also been confirmed in past research across US states by Poterba (1995) as well as Bohn and Inman (1995). The explicit mandate of improving debt-to-GDP ratios as a flow, rather than stock, variable means that we should expect the balanced budget rule to act as the most effective mechanism for sustaining positive balances or preserving a period of fiscal consolidation.

Figure 36: Changes in Primary Balances and Fiscal Rule Adoption



17 Discussion

The systematic influence of fiscal performance on budget rule adoption does not invalidate the use of budget rules as an effective mechanism for inducing optimal fiscal outcomes. It is likely that the adoption of rules, during a period of successful fiscal consolidation, signals a commitment from policymakers to sustain future improvements in macroeconomic performance, suggesting that these rules have a second order relationship with fiscal outcomes by preserving strong past primary balances. (Poterba 1996; IMF 2001) The difficulties associated with finding an appropriate instrument for these rules confines the efficacy results in this paper to a preliminary non-parametric and unconditional relationship between changes in primary balances for years leading up to and after the adoption of budget rules. Given that these results are not conditional on economic and political circumstances and do not control for economic cycles⁶⁵ means that we cannot derive a conclusive evidence as to whether fiscal rules have any *real* effects. The finding of budget rule endogeneity, however, raises questions about past parametric approaches which ignore this problem, effectively assuming the adoption of budget rules to be exogenous.

There is also a question of a multiplicative relationship between fiscal rules and institutional features which generate suboptimal outcomes. If budget rules are to act as effective deterrents for fiscal indiscipline, we should expect their adoption to counteract the effects of large fragmented government. That is to say, the negative effects produced by the common pool problem found in Table 9 may be partially offset by effective budget rules. This multiplicative relationship between budget institutions and fragmentation as they affect fiscal outcomes has been validated by both Wehner (2010) and Franzese (2005) yet these interaction effects remain largely unexplored in the literature and deserve more careful analysis in future theoretical as well as empirical applications to fiscal outcomes.

The general findings suggest that future work on fiscal rules requires that researchers take account of the fact that the decision to adopt budget rules is partly determined by past levels of responsible fiscal performance for which they are designed to sustain in the future. By assuming these to be exogenous does not allow us to derive any meaningful results regarding the first order effectiveness of these rules where it could be the case that even long lived rules only receive compliance from responsible governments. Given the large number of countries who adopted national budget rules over the 1990-2008 period, there remains a great deal of potential for examining how these rules function within, rather than between, a large sample of countries.

⁶⁵Kopits 2001; Also Debrun and Kumar use a cyclically adjusted measure of primary deficits which helps to overcome this problem but is not currently available for a global sample of states.

18 Conclusion

For the past thirty years, the academic community has devoted a great deal of attention to discovering the reasons behind the persistent and unsustainable accumulation of public debt. The objective function of policymakers, as well as institutional apparatus under which fiscal policy is formed, has become a subject of great interest and has proven to have a significant relationship with fiscal performance. The discovery of these procedural deficiencies requires solutions which structurally induced policymakers to formulate optimal policy within the confines of the constitutional boundaries under which they function. Procedural and overarching budget rules have since become a popular device for improving fiscal performance with a long line of literature verifying a cautiously optimistic correlation between the adoption of these rules and fiscal performance. Unfortunately, these results have predominantly been limited to cross national samples and unobservable fiscal indices which collapse a multidimensional budgeting process into a simplified single dimension. By confining the analysis to within country effects still fails to disclose the true effect of budget rules where profligate policymakers may be less likely to adopt (or comply with) rules which limit their budgetary discretion making them an endogenous variable in equations of fiscal performance.

The evidence in this paper suggests that governments who are in the midst of a period of successful fiscal consolidation are much more likely to adopt expenditure, debt, and budget balance rules at both the national and supranational level, confirming an endogeneity problem where the adoption of budget rules is partially determined within the equation of fiscal performance. Ignoring this endogeneity problem, there is evidence that the adoption of an expenditure or budget balance rule has a significant effect on primary balances as a percentage of GDP over the 1990-2006 period, to the extent that countries should be expected to run about 1% higher surplus's after the adoption of either of these rules; however these results do not give any insight into the *real* effectiveness of these rules. Preliminary non-parametric evidence confirms that countries are much more likely to adopt fiscal rules if they have experienced positive changes in primary balances in the years leading up to adoption, with the adoption of a budget balance rule having a consistent positive effect on primary balances. The evidence for adoption of an expenditure and debt rule is less clear with some signs of relatively better fiscal performance for countries who have adopted these rules.

The general findings in this paper suggest that, in order to discover the true effects of fiscal rules, the research community must examine the problem at a within country level as well as take into account the fact that a governments decision to adopt, or comply with, these rules is not a random one. Preliminary evidence confirms past empirical findings of a positive

correlation between fiscal rules and macroeconomic outcomes, however the fact that the adoption of such rules becomes significantly more likely during periods of successful consolidation raises endogeneity problems as well as questions regarding their 'true' efficacy and whether these effects are first or second order.

Part V

Conclusion

With the unprecedented growth of central governments and increasing levels of flexibility in 21st century systems of public finance, fiscal outcomes have become extremely important for macroeconomic stability. In order to rectify an apparent gap between theory and reality, the research community has begun moving towards a multidimensional, as well as instrumentally disaggregated, approach to the study of public finances. One of the centerpieces of this multidimensional approach has been the incorporation of political institutions and behaviour into equations of macroeconomic performance, or, the study of political economy. (Alesina and Perotti 1994) Overwhelming empirical evidence has shown that political behaviour and institutional context play a significant role in macroeconomic outcomes, meaning that these interests and institutions need to be tied back into a theoretical framework with endogenous institutions and policymakers.

19 The Composition of Revenues

The results in this section provide new insight into the relationship between revenue compositions and institutional structures of government. While these are the first to provide budget equation estimates, taking into account the unit simplex constraint associated with revenue compositions, there still remain several issues for future research to uncover before a full understanding can be gained. At the center of these, is the inability to directly estimate compliance effects from a micro perspective. While empirical evidence suggests that democratic and durable governments are able to extract larger revenue shares from more difficult to administer tax bases, there still remains the issue of the *mechanisms* through which taxpayers themselves are willing to supply relatively higher levels of revenue, as well as the increase in demand for these revenues. The static and dynamic supply and demand relationship has yet to be explored from a micro perspective and remains limited by the availability of reliable micro-level data. This is especially true in the case of unobservable 'tax moral' effects where past evidence has confirmed that such a relationship does exist, yet data limitations, along with the difficulties that come with measuring tax compliance itself, make it difficult to incorporate these directly into large scale analysis. The evidence of indirect democratic effects found in this section implicitly rely on the assumption that a small number of country specific past findings are generalizable across a global sample of states. The findings, as mentioned in the section, can only be interpreted as correlations with the micro level causal mechanisms yet to be confirmed in a large sample of states.

An additional difficulty addressed in this section is the translation of increases in the tax burden into taxpayer discontent. From a theoretical perspective, outside of the deterministic median voter world, there is no indication of how this parameter varies at a micro-level across taxpayers, and what causes it to do so. While the empirical results assume that political influence are uniformly distributed with two vote seeking parties converging on the median voter who prefers redistributive tax bases, there are several real world contexts, especially proportional representation electoral system systems, in which these assumptions are violated. (see McKelvey's chaos theorem) In such cases, further micro-level analysis (and data) is, again, required before this heterogeneity can be fully understood and tested.

To sum up, while significant correlations between tax compositions and political regimes confirm that these institutional constraints do produced systematically varying fiscal outcomes, the micro foundations or direct causal mechanisms require further theoretical and empirical analysis within a comprehensive Representation Theorem framework which incorporates the economic, administrative, and political contributions the policymakers tax decision. Tax compliance provides one potential mechanism through which the taxation for representation relationship is manifested suggesting that a relationship of trust between the taxpayer and government plays a significant role in both the administration, as well as political costs associated with revenue extraction. It is likely that this will prove an interesting and fruitful area of future research in the study of public finance.

20 Planning Horizons and Fiscal Outcomes

Over the past thirty years, a niche of literature has confirmed that the accumulation of public debt is jointly determined by a combination of economic factors relating to tax smoothing, as well as political factors, such as the number of veto players in the budgeting process, the degree to which policymakers internalize the total burden of additional revenues, and expected time horizons of policymakers. The result in this section find strong empirical supporting the veto player hypothesis, yet, the common pool problem, or the 'Law of $1/N$ ', receives less empirical support where cabinet size.

One of the most understudied areas in the political economy of public finance is that of probabilistic planning horizons. The few empirical contributions which do exist in this area have consistently validated theoretical expectations that policymakers with relatively lower expected likelihood of remaining in office leads to lower levels of fiscal discipline. Much of this past work, however, has been constrained by the fact that probabilistic planning horizons are unobserved, leading to difficulties in estimating their true effects. The lack of real world cases

where term limits are fixed, has forced researchers to rely instead on proxy measures of expected time horizons. The results in this section are the first to take into account this endogeneity problem, validating these findings in an appropriate statistical framework. Fiscal indiscipline appears to be *at least* as much a function of how heavily governments discount the future as the institutional setting under which they formulate fiscal policy.

A second empirical difficulty is the possibility of voter myopia. In cases where taxpayers exhibit short memories when it comes to fiscal performance, incumbents will be able to use expansive fiscal policy to increase their chances of re-election through increased expenditures with no increases in taxation. The results in this section suggest that voters do indeed remember past fiscal performance and judge actors accordingly, with less responsible governments being more likely to be kicked out of office in period $(t + 1)$.

The consistency of findings across the small niche of empirical tests of the 'discount rate' effect of finite planning policymakers on fiscal outcomes raises interesting questions regarding potential remedies for a problem which is a fundamental institutional feature of modern democracies. Electoral uncertainty cannot be rectified through the concentrating of power in the hands of a small number of policymakers; or, through the use of budget rules, which would lack credibility in this context. We can, however, rest assured that taxpayers memory of the past is greater than incumbent policymakers ability to internalize the future.

21 Endogenous Fiscal Rules

The systematic influence of fiscal performance on budget rule adoption suggests that the decision to adopt these rules is partly determined by it's past macroeconomic circumstances. As noted, the results in this section do not invalidate the use of budget rules as an effective mechanism for inducing optimal fiscal outcomes, but do take into question the order of it's effect. It is likely that the adoption of rules, during a period of successful fiscal consolidation, signals a commitment from policymakers to sustain future improvements in macroeconomic performance, suggesting that these rules have a second, rather than first, order relationship with fiscal outcomes by preserving strong past primary balances. The preliminary non-parametric and unconditional relationship between changes in primary balances for years leading up to and after the adoption of budget rules suggest that there may exist a second order effect, yet it remains an important question for future research to statistically validate, given that these results are not conditional on economic and political circumstances. The finding of budget rule endogeneity, however, raises questions about past results which have ignored this problem, effectively assuming the adoption of budget rules to be exogenous.

In sum, the results in this section suggest that the assumption exogenous fiscal rule adoption cannot be empirically justified. The finding that these rules are determined within equations of fiscal performance does not allow researchers to derive any meaningful results regarding the true effectiveness of these rules without taking into account the endogeneity problem. The large number of countries who have adopted national budget rules over the 1990-2008 period provides a rich resource of data for future research to examine in more depth how these rules function within countries. One interesting line of research would be to examine the problem using a backwards approach, isolating only countries who have adopted specific rules, and separating those who maintained strong fiscal balances from those who have adopted and failed to comply. If any systematic patterns emerge across economic and political circumstances (transparency) which distinguish the successful adoption from unsuccessful adoption, this would allow policymakers to get a better idea of the circumstance under which budget rules work. This would provide interesting insight into the apparatus under which compliance with rules is achieved, rather than the general effectiveness of rules themselves.

22 What Should the Reader Gain from this?

In the introduction to this thesis, the granting of discretionary budgeting powers to policymakers whose utility functions potentially fail to match those of the societies they govern was highlighted as a central theme as well as an argument for endogenizing the role of these actors when studying macroeconomic outcomes. In Part 2, both the theoretical literature and new empirical evidence in this thesis suggests that the structure of tax compositions are significantly influenced by the broad overarching political framework under which they are formulated as well as the dynamic relationship of trust between the taxpayer and government (as was highlighted in the case studies of part 1). Although these findings lead to a large number of currently unanswered questions regarding the microfoundations of the mechanisms behind these significant differences, the fact that they exist suggests that future research is necessary for further advancement. The results of part 3 suggest that institutional constraints placed upon policymakers do, in fact, lead to real effects on macroeconomic performance. The discount rates associated with uncertain tenure, however, strikes deeper at the heart of the framework under which policymakers function, leading to more fundamental questions regarding how to overcome fiscal problems associated with the core institutional bounds of a democratic system. In order to structurally induce social welfare maximizing outcomes requires some degree of 'checks' on the discretionary power of policymakers. These checks have recently been accommodated by a large number of governments who have adopted explicit budget rules in order to constrain their policymaking powers. The

downfall to the adoption of such rules is the potential endogeneity problem where policymakers may adopt such constraints in times where they are necessary under the current macroeconomic climate. The results in part 4 suggest that this may be the case, however these rules may act as second order determinants which commit policymakers to maintain such rules over longer periods. Although the greater part of this thesis suggests that more research is required before conclusive evidence can be proclaimed, the overarching theme that political institutions do matter for macroeconomic outcomes, has been greatly advanced.

Appendix A - List of Countries for Part 2

Afghanistan	Germany	Norway
Albania	Greece	Pakistan
Argentina	Guinea	Panama
Armenia	Honduras	Paraguay
Australia	Hungary	Peru
Austria	India	Poland
Bahrain	Indonesia	Portugal
Bangladesh	Iran	Romania
Belarus	Ireland	Russian Federation
Belgium	Israel	Rwanda
Bhutan	Italy	Singapore
Bolivia	Jamaica	Slovak Republic
Brazil	Japan	Slovenia
Bulgaria	Kazakhstan	South Africa
Burundi	Korea, Republic of	Spain
Cambodia	Kuwait	Sweden
Canada	Latvia	Switzerland
Chile	Lebanon	Syria
Colombia	Lithuania	Tajikistan
Congo, Republic of the	Macedonia	Thailand
Costa Rica	Madagascar	Tunisia
Cote D Ivoire	Malaysia	Turkey
Croatia	Mauritius	United Arab Emirates
Cyprus	Mexico	United Kingdom
Czech Republic	Moldova	United States
Denmark	Mongolia	Ukraine
Dominican Republic	Morocco	Uruguay
Egypt	Myanmar	Venezuela
Estonia	Nepal	Zimbabwe
Finland	Netherlands	
France	New Zealand	
Georgia	Nicaragua	

Appendix B - List of Countries for Part 3

Albania	Latvia
Argentina	Lithuania
Armenia	Luxembourg
Australia	Madagascar
Austria	Malaysia
Bahrain	Malta
Belarus	Mauritius
Belgium	Mexico
Bhutan	Moldova
Bolivia	Mongolia
Brazil	Morocco
Bulgaria	Netherlands
Burundi	New Zealand
Canada	Nicaragua
Congo, Republic of	Norway
Costa Rica	Pakistan
Croatia	Panama
Cyprus	Peru
Czech Republic	Poland
Denmark	Portugal
Dominican Republic	Romania
Egypt	Russian Federation
Estonia	Singapore
Finland	Slovak Republic
France	Slovenia
Georgia	South Africa
Germany	Spain
Greece	Sweden
Honduras	Switzerland
Hungary	Tajikistan
Iceland	Thailand
India	Tunisia
Indonesia	Turkey
Iran	United Kingdom
Ireland	United States
Israel	Ukraine
Italy	Uruguay
Jamaica	Venezuela
Kazakhstan	Zimbabwe
Korea, Republic of	

Appendix C: Country - Year of Budget Rule Adoption (Part 4)

	Revenue Rule	Expenditure Rule	Debt Rule	Balanced Budget Rule
Argentina		2000	2000	2000
Armenia			2008	
Australia	1998		1998	1998
Austria			1995*	1995* & 1999*
Belgium			1992*	1992*
Benin			1999*	1999*
Botswana		2003		
Brazil		2001	2001	2000
Bulgaria		2006	2003	2007*
Burkina Faso			1999*	1999*
CAR			2002*	1996*
Cameroon			2002*	1996*
Canada		1998	1998	1998
Cape Verde				1998
Chile			2002*	2000
Congo Rep				1996*
Costa Rica		2001		
Cyprus			2004*	2004*
Czech Republic		2005	2004*	2004*
Denmark	2002	1994	1992* & 2003	1992 & 1992* 2003
Ecuador			2004*	1993 & 2004*
Estonia		1999	1995*	1995* & 1998
Finland		1998	1992* & 2008	1992*
France	2006	1982	1992*	1972
Germany			1992*	1992*
Greece			1998*	
Grenada			2004*	2004* & 2007
Hungary		2004		
Iceland				2004
India				1967
Indonesia			1992*	1992*
Ireland		2005		1992
Israel			1992*	1992*
Italy			1997	
Kenya	1997		2004*	2004*
Latvia			1997	2004*
Lithuania	2008	2008	1990 & 1992*	1992*
Luxembourg		1990		2006
Madagascar	2006	2006		1999*
Mali			1999*	1999*
Malta			2004*	2004*
Mauritius		2008	2008	
Mexico	2006			2006
Namibia			2001	
Netherlands	1994	1994	1992*	1992*
New Zealand			1994	1994
Niger			1999*	1999*
Norway				2001
Pakistan			2005	2005
Panama			2002	2002
Peru		2000		2000
Poland			1997 & 2004*	2004*
Portugal			1992*	1992* & 2002
Romania			2007*	2007*
Senegal			1999*	1999*
Slovak Republic			2004*	2004*
Slovenia			2004*	2001 & 2004*
Spain			1992*	1992* & 2003
Sri Lanka			2003	2003
Sweden		1996	1995*	1995* & 2000
Switzerland				2003
Togo			1999*	1999*
UK			1992* & 1997*	1992* & 1997*

*- Supra National Budget Rule

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