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Fiscal Policy from a Public Choice Perspective

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1. Introduction

Fiscal policy is one of three major policy tools (the others being monetary policy and regulation) used by government to influence the private economy. For some time now monetary policy--money rules and inflation targeting--has been the focus of policy attention at the aggregate level (Blinder, 2006), while regulation/deregulation issues have preoccupied policy analysts at the micro level. However the events of last few years, particularly those associated with the 2007-2008 financial crisis, have reawakened interest in fiscal policy. In part this is due to the perceived failure of financial regulation to prevent the crisis and the concomitant failure of traditional monetary policy (the hitting of the zero interest bound) to moderate the subsequent recession. There are now new fears over the consequences of the huge deficits accumulating to deal with the ongoing recession.

Fiscal policy refers to the government's ability to tax and spend either to influence the economy directly or to realign the incentives facing private agents and so restructure the economy indirectly. From a public choice perspective fiscal policy raises a host of collective choice problems associated with how citizens use or abuse the powers of the state to achieve private and collective objectives. From a macro perspective, public choice considerations raise issues associated with endogenizing government within formal macro models.

The reasons why individuals in a community might wish to use government to intervene fiscally in the economy are usually grouped into one of two categories: reasons for government to have a permanent presence in the economy and reasons why temporary government intervention might be desirable. The former are viewed as long run in nature and are usually discussed in terms of the factors that explain the size of government in the economy and/or its growth through time (Borcherding, 1985). The reasons for transitory government intervention in the economy relate to the perceived gains that

can arise from smoothing the business cycle. The latter issues are the ones that usually fall under the heading of fiscal policy.

It is apparent, however, that while it is possible to separate the motives for government spending and taxation conceptually into those directed at long versus short run objectives, the actual policies adopted typically combine both. For example, adopting progressivity in income tax rates may help to achieve greater business cycle stability but at the same time promote a larger sized government by lowering the political cost of maintaining that size. Similarly fears that the absence of an effective constraint on government spending has encouraged myopic politicians to adopt excessive debt has led to the imposition of constitutional constraints on political behavior, such as through the adoption of balanced budget amendments. These in turn restrict government's ability to address instability over the shorter run (Poterba, 1997; Hou and Smith, 2010). Perhaps even more fundamentally, if tax decreases and expenditure increases were equally effective in influencing aggregate demand, the choice of which policy instrument to use in relation to the business cycle would depend in part upon whether the long run size of government was believed to be too large or too small.[1] These examples suggest that policy choices involving the scale or even the instrument to be used in short run intervention will involve considerations that interact with the long run. They involve more than just the transitory deadweight losses associated with business cycle analysis. From a public choice perspective the two sets of considerations are even more interrelated because both short and long run decisions are made by the same set of agents.

Even if the theories explaining long and short run government policy were strictly separable, the measures of taxation and spending used for hypothesis testing combine both policies in a single time series. Hence neither type of policy can be tested independently. This is not something that can be overcome by disaggregation, since each separate element combines both. The result is that the test of

[1] For example, the belief that government is too large means that recessions would be better fought with tax reductions than with further spending increases.

any short run fiscal hypothesis must recognize that longer run spending/taxation choices are jointly present in the data and that any actual test will incorporate, at least implicitly, a long run hypothesis relative to government size. It follows that how the long run is removed from the data becomes an important part of any test of the level or effectiveness of fiscal intervention. Hence from a public choice perspective, both conceptual and data concerns suggest that the two types of policy decisions should be tested jointly (Winer and Ferris, 2007; Ferris, Park and Winer, 2008).

Finally, a public choice perspective also means recognizing that fiscal policies reflect collective choices exercised through political means and implemented through bureaucratic institutions. Because of this, the characteristics of both the political and the institutional environment will play an important role in the analysis of long and short run fiscal choices.

2. Plan

In the following pages I discuss a subset of these issues beginning from a basic model designed to illustrate the methodology typically used in fiscal analysis and to provide a departure point for public choice considerations. I begin by endogenizing government within a traditional macroeconomic model. The model is typically macroeconomic in the sense that it avoids distributional issues, is general equilibrium in nature, and achieves tractability by assuming away various types of transactions and coordination costs. For example, macro models typically assume away the costs of using private markets and the principle-agent problems that arise within the firm. Under competitive conditions this collapses the distinction between the household and the firm on the private side of the model.[2] For our purposes, the more important initial assumption is that the political process lying behind the use of the state to provide government services is competitive and works costlessly so that no principle-agent type

[2] Another simplification that has received considerable attention recently is the assumption that credit markets and the financial intermediaries that bring together savers and investors operate costlessly. The recent failure of such financial coordinating mechanisms has made the question of how to incorporate such problems tractably into macro analysis perhaps the most important current issue in macroeconomics.

problems arise between households, politicians and policy makers. While an obvious exaggeration, this case provides a convenient benchmark against which different longer run theories of government can be compared. It also highlights the macroeconomic significance of the steady state from which the transitory shocks that lead to short run departures and the demand for fiscal intervention are typically discussed. Throughout examples of the hypotheses, tests, and empirical findings relevant to a public choice perspective are given. The last section of the paper deals explicitly with the measurement issues associated with testing theories of fiscal behavior and the problems presented by combining economic and political data.

3. A traditional macro model of government size and fiscal policy: the Long Run

I begin by building a simple closed economy macro model where the community consists of two parts: a household sector and a government sector. The household sector consists of a representative agent that maximizes a time separable utility function together with an aggregate production function from which private consumption, government services, private and government investment can be fashioned.[3] The household chooses the hours of work (leisure), h_t (l_t) , private consumption, c_t, along with the holdings of real money balances, m_{t+1}, and real government bonds, b_{t+1}, and private investment, $k_{t+1} - (1-\delta)k_t$, that will maximize its expected lifetime utility subject to a production technology and given levels of lump sum transfers/taxes, τ_t, an income tax rate, s_t, and the levels of services, g_t, and capital stock, , provided by government. Given their knowledge of household behavior, the government then chooses the tax rate, the levels of government service, government investment, and the issuance of money and bonds that will maximize its objective function. To start I assume that the government's objective function coincides with household's. This provides a neutral starting position from which alternative theories of the role of government can depart. It also provides a convenient point to engage

[3] For the existence of a unique money economy I assume that the three goods are complements and that the household can be satiated in their holdings of real money balances.

traditional macro analysis, where typically it is simply assumed that governments maximize household utility and policy should be evaluated relative to household preferences.

i. The Community Decision Problem

The household to maximize a continuous concave welfare function of the form,

where and , (1)

subject to HBC: (2a)

TC: , (2b)

PF: where (3)

GBC: (4)

The model has one random (exogenous) shock that introduces uncertainty and variability into the model (in production) but others could be added to the model and typically are. The representative agent assumption implies that private debt must cancel so that the bonds in this problem are government bonds (the analysis also assumes that the interest paid to the central bank on its holdings of government bonds is repaid to the government as operating profit). The maximization problem is subject to initial conditions, M_0 and B_0, and to transversality conditions.

Using a value function, this economy can represented as a dynamic optimization problem with two sets of decision makers: households and the government. The constrained optimization version of the problem can then be represented through the lagrangian

. (5)

The first order conditions for an internal household optimum are:

, (6a)

, (6b)[4]

, (6c)

, (6d)

. (6e)

The corresponding first order conditions for government are:

, (7a)

, (7b)

, (7c)

, (7d)

. (7e)

The envelope conditions for the household (advanced one period) are:

, (8a)

, (8b)

(8c)

To interpret these conditions, first note that from (6a) and (7b) that the lagrangians are found as

and . Combining the equations in (8) with those in (7) we find for the household:

, (9a)

, (9b)

[4] This assumes that the household recognizes its contribution to the production of public goods through the tax revenue it generates from working.

— —— , (9c)

— — . (9d)

The first of these conditions is the Euler equation for allocating consumption optimally over time. This is achieved by equating the marginal utility of a unit of consumption foregone today with the present value of the expected utility received by consuming the gross return realized next period. The second condition sets the marginal value of lost leisure equal to the marginal utility gain from enhanced private and public output. Equation (9c) requires the utility generated by holding a real dollar today to equal the utility loss from postponing consumption for one period (and receiving no interest on money holdings.) The final condition states that the optimal investment strategy for the household is to accumulate capital as long as the discounted expected utility gain from investment (increasing both expected future private output net of taxes that can be consumed and future taxes that results in more government spending) exceeds the utility foregone today from making that investment.

Turning next to the government, after using the lagrangian solutions of (6a) and (7b) in (7a), the optimal tax rate should be set by the government such that the marginal utility gained from additional government spending is just equal to the utility loss in present consumption. That is, s_t is set such that

which implies . (10)

Deriving the envelope conditions for government and advancing them one period we find:

—— , (11a)

————, (11b)

. (11c)

Substituting these conditions back into (7c)-(7e),

— ——, (12a)

, (12b)

(12c)

Note that the first of these conditions, (12a), in conjunction with (12b) requires the government to increase the supply of real money balances as long as (see the discussion following (22)). The second condition is the corresponding Euler equation for government and states that government bonds should be issued as long as the utility gain from having more government consumption today exceeds the loss in utility tomorrow when the borrowing must be repaid in terms of foregone future government consumption.[5] The third condition represents the optimal investment rule for the government. The government should increase the government capital stock as long as the present value of the expected utility gain from additional private consumption and additional tax revenue (and hence future government output) generated by that investment exceeds the utility cost of foregoing government consumption today.

If we now use the optimal tax rate setting condition from (10), then it also follows that the accumulation decisions for the government and the household are consistent. More specifically, from (12c) and (9c)

. (13)

Similarly from (12b) and (9a), the expected returns from household and government borrowing/lending are equalized,

. (14)

[5] Substituting (12b) into (12a) shows that the expected utility gain from reallocating government consumption through time by bonds and money must be equalized.

ii. Steady State Values

With this background we can solve for steady state values by setting the shock equal to zero, i.e., $z_t = 0$, and then imposing the steady state conditions

etc. Applying this to (9a), the household Euler equation gives us,

—— or, if , , (15)

which are alternative ways of writing the Fisher equation. Using (10) in the steady state version of (13),

, (16)

and using either (12b) and (12c) together with (9a) and (9c) and (15),

—

so that . (17)

If we assume that the production function, satisfies the Inada conditions for both inputs, then the steady state values of k^{ss} and k^{gss} implied by (17) will be unique. This in turn implies that steady state output is uniquely determined as

. (18)

In the steady state real money holdings must be constant over time. This implies that

—— —— which in turn means that ———— ———— That is, in the steady state the rate of growth of the money supply, will equal the inflation rate, , so that . If we assume that in the steady state money growth enters the model only through lump sum transfers made by the government, then

———— ∀ j in the steady state. (19)

Finally we note that government bonds have no value in the model other than reallocating consumption and tax payments through time. Hence the constancy of the stock of government bonds in the steady state implies It follows that the government budget constraint becomes

. (20)

Using the same information, the household budget constraint reduces to

. (21)

where both g^{ss} and c^{ss} both depend upon the tax rate chosen, s. Finally, in the steady state the optimal tax requires

. (10)

While it would seem that (20),(21) and (10) are sufficient to define a solution to c^{ss}, g^{ss}, and s^{ss} (and thus result in what is called superneutrality) the marginal utilities in (10) are not independent of the level of real balances, m^{ss}, and hence are not independent of the rate of inflation, θ^{ss}, or the rate of interest i^{ss}.[6] Hence to close the model, we note that (10) also implies that the steady state demand for money in (9a) and (9b) will equal the supply of money in (12a) and (12b). In addition, using (9a) and (9b), we see that

_____ ___ . (22)

Hence the four equations (20), (21), (10) and (22) can be used to solve for the values of c^{ss}, g^{ss}, s^{ss} and m^{ss}.[7] Because c and g are complementary with m^{ss}, (22) implies that real money holdings will fall as the steady state money growth rate and money rate of interest rise. Similarly because real money holdings generate utility and are complementary with the other goods in the model, the optimal rate of inflation will be the one that generates the highest level of real money holdings, often called the Friedman rule. This implies an inflation rate that drives the money rate of interest to zero, i.e., is optimal. In this case and real money holdings are satiated.

[6] The resource constraint for the economy is the sum of the two individual budget constraints which, for the steady state, becomes $sy^{ss} + (1\text{-}s)y^{ss} = c^{ss} + \delta k^{ss} + g^{ss} + \delta k^{g\,ss}$ or $y^{ss} = c^{ss} + \text{investment}^{ss} + g^{ss}$.

[7] In a more general context that distinguished the services of capital and labor, Char, Christiano and Kehoe (1994) solve for a steady state in which the optimal expected tax rates set on capital and labour differ (with an optimal expected tax rate on capital of zero).

The model above solves for the levels of g^{ss} and $k^{g\,ss}$ that maximize representative household utility subject only to underlying community fundamentals--household tastes and production technology (and the assumed mechanisms for collecting taxes). Its optimality provides a convenient starting point for the discussion of fiscal policy because to the extent that external random shocks drive the economy temporarily away from this long run equilibrium, any movement back towards equilibrium will increase community welfare (should fiscal intervention be implemented at low enough cost). As presently structured, however, there are no reasons in our analysis for policy to be relevant. The absence of externalities and public goods means that the productivity shock brings a change in real transformation possibilities to which households will wish to adjust and the model contains no impediments to adjusting optimally. As currently structured, the absence of information and flexibility constraints on adjustment implies no departure between any private and social cost and hence no efficiency gain from induced readjustment.

It follows that for fiscal intervention to increase welfare, the model must contain additional elements (information and transaction costs, frictions, or rigidities in the short run) that mirror real world constraints on the ability of private agents in the economy to adjust to altered circumstances while not constraining as severely the ability of government to recognize and respond. Typical ways of adding frictions to the analysis include the addition of temporal restrictions on the information set available to households relative to government and the adoption of Calvo pricing or costs of adjustment to restrain price flexibility in the short run (in models with price setting). Alternatively information and other transactions costs can be used to generate reasons for explicit or implicit private contracts. Such obstacles to short run adjustment then lead to a series of temporary equilibrium that define a transition process from impact effect back to long run equilibrium. In such a context short run fiscal policy can have an efficiency role by minimizing the departure from and/or speeding the process of adjustment back to long run equilibrium.

iii. Public choice and long run government size

Before turning to a description of how fiscal policy can be used to affect short run deviations arising about the steady state, it is worth considering what fiscal features of this long run equilibrium have been tested and receive empirical support. To the extent this departure point is biased, the resulting short run analysis would need to be modified.

The feature of the model that has perhaps received the greatest attention is the hypothesis of Ricardian equivalence and its corollary that government bonds are not net wealth (Barro 1974). In our model, if τ_t is increased with and $\forall$ t kept constant (representing a reduction in current lump sum taxes), the necessity of maintaining its budget constraint means that the government must borrow more today. The addition of the no Ponzi game condition then implies that future taxes (of equivalent present value) must be raised to pay off higher borrowing.[8] Because government tax collections are household tax payments, the formal combining of household and government budget constraints forces household recognition that the presently received reduction in taxes will be matched with an equivalently valued increase in taxes in the future such that its net wealth is unaffected.[9] It follows that because the consumption possibilities available to the household in the model depend only on the present value of its net income, there is no reason for any consumption choice to be altered.

The limitations of Ricardian equivalence are now well known (Bernheim, 1987 and Seater, 1993) and are reflected in the assumptions built into the formal analysis above. For example, if the households choosing today face a limited rather than infinite lifetime, then any lowering of taxes today can result in the postponement of tax repayment into a future generation. It follows that unless utility of future generations is fully reflected in today's choices (intergenerational altruism), the choices made today will

[8] Successive substitution into the short run budget constraint results in a long run budget constraint that nets out inter-period bond holdings except for initial holdings and net borrowing at infinity. The no Ponzi game condition requires this later term to be zero.

[9] A corollary of the hypothesis is that fiscal deficits are stationary. See Bohn (1998) who provides strong evidence of fiscal stability for the U.S. and Neck and Getzner (2001) for Austria.

be different than otherwise. Similarly if reallocating income across time through the government budget constraint can be done at lower (or higher) cost than reallocation through private markets, household wealth will be increased (decreased) and household consumption affected correspondingly.

Early tests by Kormendi (1983) and Aschauer (1985) positioned Ricardian equivalence with respect to a tax decrease relative to a Keynesian alternative (where government bonds were viewed as net wealth and household consumption was separable from government spending) and found evidence broadly consistent with Ricardian equivalence. These results initiated a large number of further studies with results that often depended upon the time period chosen and/or variables covered (Haug, 1990; Feldstein, 1982). Nevertheless, in an extensive survey of the large literature that had grown up on this topic Seater (1993, p. 143) found that despite the near certain invalidity of Ricardian equivalence as a literal description of the economy, a "dispassionate reading of the literature" leads to the conclusion that Ricardian equivalence may hold as a "good approximation".[10]

The significance of the long run outcome captured in the model above is that the addition of exogenous random shocks, either real or nominal, will perturb endogenous variables symmetrically about an optimum. Hence the case for short run fiscal policy can be analyzed in the context of foregone utility from symmetric departures from an otherwise efficient long run equilibrium (as they could not if starting from a position of either too large or too small a government size).[11] However, the assumption that government chooses to maximize household utility is highly problematic from a public choice perspective both because government services are allocated through political markets that function differently than economic markets and because the agents that make the choices on behalf of the

[10] The theoretical limitations highlighted by the Ricardian equivalence debate provide a stronger motivation for the role of debt finance/tax reduction in relation to short run policies to address temporary departures from long run equilibrium (e.g., the importance of distribution, liquidity, uncertainty, and information asymmetries in the transition).

[11] Hence the concern in New Keynesian models such as Woodford's (2003) that monopoly producers receive a production subsidy to align the monopolistically competitive output of the private sector with the output that would be produced under competition.

government have no particular reason to maximize household utility at the cost of their own. For this reason, a long list of public choice economists (Tullock, 1959; Ohlson, 1965; Caplan, 2001 to mention only a few) have argued that utility maximizing politicians accountable only to myopic voters who suffer from fiscal illusion (or rational ignorance), or who use voting rules that give decision making power to the median voter (Black, 1948, Meltzer and Richard, 1983) and/or who implement policy with behavioral incentives that allow for bureaucratic or regulatory capture (Niskanen, 1975; Peltzman, 1980) result in a government size that is too large from the household's perspective. In the context of macro analysis, this implies that the objective function determining choice in the government sector weighs more highly the value of government services and the productivity of government capital than do households. The result would be a steady state where instead of equations (10) and (17) holding, we would find

and . (23)

Alternatively it could be argued that as the monopoly supplier of some services, governments either lack the incentives and the information needed to respond fully to household demands (Downs, 1960; Ram, 1989) or are run by politicians/bureaucrats with private opportunities for corruption (Giuranno, 2009) such that too low a level of government service is provided.[12] In this case the objective function determining government choices would give a lower weight to government consumption and investment and the conditions in (23) would be reversed. On the margin, the household's evaluation of government services would exceed that of private goods while productivity in the government sector would exceed that of the private sector.

Finally, a growing number of public choice economists (Wittman, 1989; Breton, 1996; Hettich and Winer, 1999; Besley, Persson, and Sturm, 2005), many of whom use probabilistic voting models (Coughlin and Nitzan, 1981; Enelow and Hinich, 1989; Adams, Merill and Grofman, 2005) argue that

[12] A literature search in Econlit reveals very few of the many recent papers on government size take seriously the hypothesis that government size may be too low. Those that do are typically concerned with issues of corruption in developing economies (e.g., Yavas, 1998).

competition among political parties is the key requirement for politicians and bureaucrats to behave as if they maximized household utility. Here a sufficient level of political competition is needed to reward those who provide voter valued services at lower cost and penalize those who do not. When that is present, one would find the equations in (23) meeting more or less with equality.

It is then households' evaluation of current levels of private versus government consumption and the productivity of private versus government investment that are the tests for whether the size of government is too large or too small. However the fact that government services are not marketed makes the evaluation of the first of these conditions somewhat problematic (Carr, 1989). As a consequence most researchers have turned to analyze the effect of a permanent change in government spending on output, wealth, productivity, and/or growth and used this outcome to assess optimal size. Aschauer (1988) notes, for example, that in general equilibrium a permanent rise in government spending (an injection valued at 1) will withdraw equivalent resources from the private sector that will reduce private consumption (whose value in his analysis is represented by γ) and/or private investment (whose value in his analysis is represented by μ). Aschauer then reports estimated values of γ in the range of .25 to .4 (Aschauer, 1985 and Kormendi, 1983) and an estimate of μ of approximately .4 (Ahmed, 1986). Because $\mu + \gamma < 1$, he concludes that government size is "too large" with a permanent increase in government size reducing the aggregate size of the pie available to the community and hence net wealth.[13] On the other hand, Karras (1996b) examines a large number of countries and finds that government is overprovided in Africa, underprovided in Asia, and more or less optimally provided in the rest of the world.[14] Moreover, in a series of papers that focus on the productivity of government investment in Europe, Karras (1996a and 1997) finds the hypothesis that the marginal products of

[13] This analysis abstracts from further losses that would arise if tax rates are distorting.

[14] Recent work on OECD countries by De Witte and Moesen (2010) suggests that only Australia, New Zealand, Norway and the U.K. would benefit from larger sized governments.

private and government capital are equal cannot be rejected.[15] Ram (1986) provides one of the few studies that concludes that larger government size would improve economic performance and finds a higher level of factor productivity within government than that found in the private sector, at least for the period of the 1960s.

There have been many more empirical studies on the relationship between government size and growth. Most of these concur with Landau (1983) and Barro (1991, 1997) who find that increase in the ratio of government consumption to GDP will depress output growth (see also Folster and Henrekson, 2001). However, a number of authors have questioned these findings, stressing the 'fragility' of the relationship of most fiscal measures with growth (Easterly and Rebelo, 1993) and point to reliability issues coming from simultaneity and selection problems in combination with weak instruments (Agell, Ohlsson and Thoursie, 2006). Even so most recent studies tend to confirm the negative association of growth with government consumption (see Afonso and Furceri, 2008; Romero-Avila and Strauch, 2009; Ghosh Roy, 2009). But while the consumption relationship may be negative, the relationship between government investment and growth is most often found to be positive. Ram's early work (1986, 1989) stresses a positive externality arising (implicitly) from government investment to growth while Easterly and Rebelo (1993) find a strong positive effect arising from the government's provision of transportation and communication capital. Still others point to a strong positive relationship between government provided education expenditures and growth (Landau, 1983; Evans and Karras, 1994). Expanding dimensionality from size to variability, Romero-Avila and Straud (2009) investigate the relationship between growth and the size and volatility of most components of government spending/taxes and find that while most components have a negative association with trend economic growth, public investment is one of the few that has had a positive impact on European growth.

[15] Unlike Kormendi (1983) and Aschauer (1985), Karras 1994 finds that private and government consumption are complements rather than substitutes.

Despite a widespread presumption in the public choice literature that government size is too large, there appears no strong empirical consensus on whether government size overall is too large, too small, or just about right for most countries.[16] While there does seem a consensus that further increases in government consumption would be harmful to growth, there remains sufficient evidence on the positive benefits of government investment to support one's favorite theory of government size. Because of the advantage offered by generating symmetric welfare losses in departures from long run equilibrium, I retain the steady state derived in the analysis above as the point of departure for short run or transition analysis.

4. Fiscal Policy and the Short Run

i. DSGE Modeling

Given stability so that the endogenous variables converge on long run equilibrium, permanent and transitory changes to the model's fundamentals set in motion a pattern of adjustment in time. This dynamic adjustment process is typically modeled by linearizing the system (using first or, increasingly, second order approximations) about its steady state and then solving the resulting set of difference equations. While a solution that describes the transition process between steady states (comparative dynamics) or back to the old equilibrium (stability analysis) can often be shown to exist, an analytic solution is usually not possible. To make the analysis operational, a dynamic stochastic general equilibrium (DSGE) model is constructed by calibrating the model, i.e., applying empirical estimates of the model's key parameters, and then simulating the characteristic movements of the specific economy under study. Here the usefulness of the model is judged by how closely the model replicates certain characteristic empirical moments of the economy through time (e.g. the humped shaped response of output to external shocks). If successful, the resulting structure is used to explore such questions as the

[16] The empirical finding that appears most frequently, that an increase in government consumption share of GDP will decrease the growth rate, need not imply that government consumption services are oversupplied. In the same way that a change in tastes from future to present (private) consumption would reduce growth but raise welfare, the loss of final output need not mean that the new combination of outputs is not more highly valued.

effect on the model's key variables (and ultimately welfare) of changes in government spending, taxes, and deficits (accumulated debt).

When we linearize the real business cycle model developed in Section 3, the resulting DSGE model has the productivity shock affect output not only directly but also indirectly by increasing the marginal productivity of labour and so the incentive to work both intra- and inter-temporally. As importantly, the productivity change will affect lifetime earnings and hence both private consumption and labour supply through the resulting wealth effect (Baxter and King, 1993). It is though these wealth effects that permanent and transitory changes in government spending (and taxes) produce different effects on aggregate demand and supply (depending in part on the information structure of the economy and thus the degree to which Ricardian equivalence is expected to hold).

But while DSGE models can be used to describe the effects of alternative policy rules and policy shocks on the time pattern of employment and output, the role of fiscal policy in the short run is not simply to remove the fluctuations produced by external shocks. Some shocks, such as the productivity shock above, represent changed circumstances to which welfare will be lost if no adjustment is made.[17] Rather, the economic motivation for policy is an improvement in welfare and that possibility requires the presence of private adjustment costs to individuals and private institutions that prevent or slow down readjustment relative to what could be produced by policy. Hence for policy to be relevant in the short run, the dynamics modeled must embody frictions, imperfections, conventions, information and/or other transaction costs that generate one or more externalities whose negative effects policy can minimize. The need for these types of adjustments to the basic model is suggested by studies that note empirical regularities in most economies that cannot be accounted for by flexible price, real business cycle models (Rotemberg and Woodford, 1996; Gali and Rabanal, 2004). Typical features that are then added to the basic model of section 3 include monopolistic completion with Calvo pricing (Calvo, 1983)

[17] Hence Woodford's emphasis on optimal policy defined through government's ability to close the gap between actual and flexible price equilibrium rather than between the actual outcome and the stationary state.

and/or costly price adjustment (Blanchard and Kiyotaki, 1987), wage or price contracting (Taylor, 1979, 1980), asymmetric information (Lucas, 1975), liquidity constraints (Zeldes, 1989) and allow aggregate demand to feature more prominently in adjustment. These new Classical or Keynesian DSGE models are given additional features such as price indexation (Christiano, Eichenbaum, and Evans, 2005), habit formation (Campbell and Cochrane, 2000), a financial accelerator (Bernanke, Gertler and Gilchrist, 1996), capacity constraints (Gilchrist and Williams, 2000) and various other strategic complementarities (Cooper and John, 1988) to allow the analysis to capture the higher degree of persistence observed in the data. It follows that the welfare gains possible from policy in these models will be a function of the types of imperfections built into the analysis.

The difference in approach and emphasis within DSGE modeling can be illustrated by two recent papers. In Uhlig (2010) a DSGE model incorporating real business cycle features is used to evaluate the size of government spending and tax multipliers. Applying estimates by Cogan et al (2009) of the size of the recent US fiscal stimulus package, Uhlig finds fiscal spending multipliers that are positive in the short run but become both negative and largely so over the long run. The positive multiplier effect in the short run is driven by the negative wealth effect on labour supply (spending is initially funded by government borrowing) and the long run negative effect on output arises from the higher levels of distortionary taxation needed to pay off higher short run borrowing. The tax alternative has a smaller short run effect but remains positive over the long run. Fernandez-Villaverde (2010), on the other hand, introduces financial frictions (arising from asymmetric information between borrowers and lenders) into a new Keynesian DSGE model that incorporates Calvo pricing and habit persistence. The financial friction adds a 'Fischer effect' to firms in the model so that the effect on aggregate demand that would typically arise from an increase in government spending (with price stickiness) is magnified by a reduction in real firm indebtedness (as the price level increases unexpectedly). This reduces the degree of crowding out in private investment. On the other hand, a reduction in labour taxes lowers inflation, increases real firm

indebtedness and hence the finance premium. This works to offset the otherwise expansionary effects on output. For this reason spending multipliers become stronger than tax multipliers.

While the usefulness of DSGE modeling to the analysis of fiscal policy may seem apparent, DSGE modeling has been directed primarily at monetary policy, analyzing such issues as alternative money rules and inflation targeting. An August 2010 Econlit search for DSGE models, for example, yielded 426 entries, which fell to 25 when the search was restricted to fiscal policy (with none arising earlier than 2005). One typical use of DSGE modeling is represented by the work by Mertens and Ravn (2009) who use DSGE modeling to evaluate what frictions would be needed to account for the observation that unanticipated tax reductions generate persistent expansionary effects in output, consumption and investment while anticipated tax cuts produce contractions in output, hours worked and investment at implementation (with expansion only thereafter). In their model the addition of adjustment costs, liquidity constraints and consumption habits were needed to replicate the observed pattern. In a similar vein, Chahrour, Schmitt-Grohe and Uribe (2009) use a DSGE model to evaluate the hypothesis that the different sized tax multipliers found empirically by structural VARs versus those using the 'narrative approach' are due to differences in their assumed reduced-form transmission mechanisms rather than to differences in their shock identification schemes. Their model allows them to reject differences in reduced forms and thus conclude that the observed differences in the estimated multipliers are due either to the different models failing to identify the same tax shocks or to small-sample uncertainty.

In work more applicable to the recent financial crisis, Werner, Szekely and Turrini (2010) investigate empirically the role played by fiscal policy across 56 countries during banking crises for the period 1970-2008. They then use DSGE simulations to provide an interpretation for their empirical finding that the strong expansionary impact of fiscal policy during banking crises is not driven by underutilized resources. Rather they find that if agents are constrained in their borrowing by the value of their collateral, fiscal multipliers during banking crises will be higher (because the fiscal expansion has

the additional effect of increasing the collateral value of collateral-constrained households thus boosting demand via a relaxation of lending constraints by banks).[18] Erceg and Linde (2010) use a DSGE model to examine the related issue of whether fiscal policy will get a "free ride" in conditions of a liquidity trap. In a model where the duration of the trap is dependent on the size of the fiscal stimulus, they show that even if the multiplier is initially high for small increases in government spending it may decrease substantially at higher spending levels. Hence it becomes crucial to distinguish between the average and the marginal spending multiplier. Similarly Christiano, Eichenbaum, and Rebelo (2009) explore explicitly the consequences for the government spending multiplier of the zero interest rate bound. Using a calibrated DSGE model with wage and price frictions, habit formation, variable capacity, and investment costs of adjustment, they show that when the central bank follows a Taylor rule the fiscal multiplier is typically less than one. However once the zero interest bound is hit (so that expansionary spending does not raise the nominal rate of interest) the multiplier becomes much larger.[19]

Finally, while fiscal and monetary policies are most often discussed separately, it is important to recognize that monetary and fiscal policies are necessarily linked through the government budget constraint. This observation has led to a literature exploring the implications of one policy being subservient to the other (Christ, 1968; Sargent and Wallace, 1987; Leeper, 1991). In this context, Resende and Rebei (2008) use a DSGE model to explore the implications of having fiscal policy dominate monetary policy. In their model with price stickiness and non-zero trend inflation, Resende and Rebei use a simple parameter to represent the fraction of government debt that must be backed by current and future budget surpluses versus the fraction financed by seigniorage. The results of varying this

[18] Note that this reinforces the mechanism used by Fernandez-Villaverde (2010) for the lending rather than borrowing side of the market.

[19] In this case the increase in government spending increases both output and prices. The expectation of inflation then lowers the real interest rate and increases aggregate demand further through increased private spending.

parameter in their DSGE model suggest significant welfare losses for countries that exhibit a high degree of fiscal dominance—in their sample Mexico and South Korea versus the U.S. and Canada.[20]

ii. Empirical Studies of Short Run Fiscal Policy

Much of our knowledge of the effects of fiscal intervention on the economy derives from VAR analysis. The classic is the work of Blanchard and Perotti (2002) who built a three variable structural VAR (featuring G,T, and GDP) to isolate the effect of exogenous shocks to taxes (T) and government spending (G) on GDP in the U.S. between 1960:1 and 1997:4. Because simultaneous contemporary effects arise among the three variables, all VAR estimations result in compacted coefficients that require additional assumptions for identification. Blanchard and Perotti used a recognition lag reinforced by administrative information on the timing of taxes and transfers to identify the automatic response of G and T to Y and so isolate fiscal shocks. Their results suggest that both increases in government spending and reductions in taxes result in relatively small, similarly sized positive multiplier effects on output. In part this is because fiscal shocks impact adversely on private investment. Perotti (2005) extended this analysis to the set of OECD countries and found similar results but with a tendency for fiscal multipliers to decline in size after 1980.[21] Studies by such authors as Benassy-Quere and Cimadomo (2006) that extend the investigation to other countries and longer time frames tend to find expenditure multipliers that are weak and often negative over longer durations.

It is important to recognize that the VAR approach seeks to identify only the effects of fiscal policy shocks--shifts in spending and/or taxes--unrelated to the response of policy to developments in the economy. Thus if short run fiscal policy were characterized completely by a feedback rule from

[20] It should be noted that DSGE modeling assumes that the behavior of the system out of equilibrium is consistent with the behavior underlying long run equilibrium. The type of behavior that arises in periods of financial crisis has suggested to some writers that 'out of the corridor' the behavior of the economic system may be quite different and call for a special role for fiscal policy. On this see Leijonhufvud (2009).

[21] As an alternative to specifying the identification conditions, Fatás and Mihov (2001) use a Cholesky ordering to identify fiscal shocks and similarly find increases in government expenditures to be expansionary.

cyclical activity in the economy, there would be no exogenous policy shock and VAR methodology would conclude that fiscal policy did not matter. Yet much of the interest in fiscal policy and its design is precisely because we desire an endogenous response by policy to the state of the economy. Hence while a fiscal policy shock may not cause output to vary much, it need not follow that fiscal policy is unimportant. The way the economy responds to non-policy shocks may depend importantly on the way fiscal policy is structured to respond to the cycle.[22]

An alternative to the VAR method for isolating fiscal policy has been to use political speeches and/or legislative actions to identify the timing and duration of tax and spending changes. Ramey and Shapiro (1998) and Edelberg, Eichenbaum and Fisher (1999) use this "narrative approach" to isolate political events and find significant and positive short-run spending effects on U.S. output and consumption. More recently, Romer and Romer (2010) use a similar approach to separate changes in taxation that arise for reasons related to economic conditions from those that arise for other exogenous reasons. Using only the latter, they find that their exogenous tax increases are highly contractionary, producing larger and more significant effects than when all tax increases were used. In a similar vein, Alesina and Ardagna (2009) focus on "large changes" in fiscal stance to assess the relative effect of government spending versus taxes on output growth and deficits in OECD countries from 1970-2007. They find that tax cuts are more likely to increase output growth than spending increases (while spending decreases are more likely than tax increases to reduce deficits).

The large differences in multiplier sizes found under these two approaches are quite striking and have generated strong efforts to resolve these differences. Tenhofen and Wolff (2007), for example, reconcile the strong multiplier effects under the narrative approach with the weak multiplier effects arising in VARs by arguing that anticipations are missing from the VAR framework. By modeling expectations formation within the VAR framework, Tenhofen and Wolff show that once the model

[22] On different meaning for fiscal multipliers, see Hansen (1973).

allows for one-period-ahead anticipation, shocks to non-defense government spending can result in significant increases in U.S. consumption (and hence larger multipliers). Others have worked to extend the dimensionality of spending and taxes, as well as the range of potential outputs, to better capture the complexities of the multipliers at work.[23]

iii. Short Run Fiscal Policy and Public Choice

Public choice adds to the analysis of short term fiscal policy by considering "the processes through which individual choices are transmitted, combined, and transformed into collective outcomes" (Buchanan, [1967] 1987, p. xi). It asks to what extent do the cyclical expenditure and tax policies set by bureaucrats charged with implementing the wishes of political parties depart from the decision making implied by DSGE analysis or from the objectives embodied in the design of political and bureaucratic institutions. More generally it asks in what way the form of the political process/institutional framework feeds back on policy choices and whether the incentives or design of bureaucratic decision making can be altered in ways that will improve efficiency and welfare?

The traditional reasons for expecting an independent political effect on policy decisions are based on either opportunistic or partisan reasons for why a political party would wish to influence economic policy.[24] Dealing first with opportunism, Nordhaus (1975) argued that an incumbent political party would use its control over policy to attempt to gain votes opportunistically by increasing aggregate demand and so output in the period immediately prior to each election. This would work in presence of information costs if myopic voters associate higher incomes/lower unemployment with more capable politicians. Then because the benefit of remaining in office is independent of the ideology of the party

[23] See the recent work of Afonso and Sousa (2009) and Afonso and Furceri (2008).

[24] See Alesina, Roubini, and Cohen (1997, particularly pages 36 and 62) for a convenient summary of opportunistic and partisan political theories and associated empirical tests. Haynes and Stone (1990) suggest that partisan and opportunistic effects may not be separable, where interdependence can be tested for with interaction terms.

in power, opportunism predicts higher rates of real output growth and/or lower unemployment rates in the period leading into elections--the appearance of a political business cycle. Following the rational expectations revolution, however, it was recognized that the continued use of pre-election spending would be anticipated such that systematic use would be ineffective in influencing voters and/or output. Since that time a variation of that hypothesis has evolved, rational opportunism (Rogoff, 1990), that uses short run asymmetric information with respect to political competence to motivate an equilibrium budget cycle. In this case, knowledge of their superior competence leads more competent politicians to use higher pre-election spending/promise lower taxes as a signal. The ability to verify competence and expose cheating ex post makes this behavioral strategy feasible over the longer run and thus generates an equilibrium political budget (rather than output) cycle on average.[25]

The second major strand of political influence on fiscal policy argues that the ideology of the political party in power matters (Hibbs, 1977). In the case of two contending political parties, the left of center party would be expected to spend more when in power than its more conservative rival. Hence the test for traditional partisanship becomes a positive sign on the coefficient of a dummy variable representing time period when the more liberal party is in power. However because any predictable policy stance must ultimately be recognized by voters, higher government spending from left wing governments will be adjusted to voters and become ineffective. For this reason rational partisan political theories refine the traditional hypothesis by arguing that only so long as the electoral outcome is uncertain will the realization of a more liberal (conservative) political party victory generate an unexpected boost to (contraction in) aggregate output or inflation (Alesina, 1987; Alesina, Roubini, and Cohen, 1997). The size of that effect will depend upon: (a) the degree of surprise in the election result; and (b) the passage of time since the election, since the realized outcome will be incorporated in revised expectations.

[25] See J. von Hagen (2010) for the prediction of a 'projection' cycle arising from the institutional incentives of the Stability and Growth Pact of the European Union.

The two sets of political hypotheses described above have generated numerous tests, the results of which have been quite mixed.[26] In general, tests for opportunism in output or unemployment have been unsuccessful, while tests of rational opportunism and its prediction of a political budget cycle are only somewhat more successful (Drazen 2001).[27] The relative lack of success in finding a political business/budget cycle has led to various refinements of the basic hypothesis. For example, Frey and Schneider (1978) have argued that political parties have multiple objectives besides retaining power so that the pursuit of opportunism will come at the cost of leaving other objectives/promises unfulfilled. This implies that opportunism will be tried only in those cases where elections are close.[28] Abrams and Iossifov (2006), on the other hand, focus on coordination costs. For them an important principal-agent problem arises between politicians and policy makers implying that the implementation of opportunism will be more likely when the decision making agents share ideologies (measured as belonging to the same political party).[29] On yet another dimension, Shi and Svensson (2006) and Brender and Drazen (2005) argue that cross-sectional evidence for the existence of a political budget cycle is explained primarily by its strength in lesser versus more developed democracies. This is seen as consistent with the hypothesis that relatively underdeveloped political institutions in newer democracies have weaker institutional controls over opportunism and hence generate more pronounced budget cycles.[30] Still others have questioned the statistical basis for cross-country studies that find no budget or output cycle by arguing that these studies do not allow for a sufficient degree of heterogeneity among the countries being tested (Bayar and Smeets, 2009).

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[26] See, for example, Serletis and Afxentiou (1998) who argue for the complete absence of any systematic effects in Canada.

[27] See Lagona and Padovano (2008) who extend the argument to predict a political legislative cycle.

[28] See also Aidt, Veiga and Goncalves (2009).

[29] While this argument is developed for monetary policy, the same argument could be applied to fiscal policy.

[30] Fatas and Mihov (2003) produce evidence from a cross country study of 91 countries that legislative constraints on 'aggressive' discretionary fiscal policy have been successful in reducing the volatility of output and increasing economic growth.

A more serious identification issue arises when the timing of each election is not predetermined. Hence in parliamentary systems, for example, opportunistic behavior suggests not only that pre-election policy may be used to manipulate or signal voters but also that the election call may be timed to take advantage of favorable economic circumstance. The latter possibility has generated a theoretical and empirical literature in the political science under the headings of election timing and cabinet or parliamentary duration (Smith, 1996; Kayser, 2005; Ferris and Voia, 2009). When election timing is endogenous, the direction of causation in the statistical association arising between economic outcomes and election dates becomes complex and more problematic (Ferris and Voia, forthcoming).

Other dimensions of political decision making process that may feedback on opportunism and fiscal policy have also been examined. For example, Persson, Roland and Tabellini (2004) argue that democracies with proportional versus majority voting rules will have less control over spending plans because their governing coalition is inherently more unstable/fragmentary. Kontopoulos and Perotti (1999) make a similar case for federal versus unitary governments. Both imply a diminished ability to use fiscal tools for opportunism.

When evidence of political influence on fiscal response is found, the evidence is more likely to be for partisan effects than for opportunism. A typical conclusion, quoted here from Alesina (1989, p.55), is that "when [opportunistic and partisan] theories are confronted with actual cycles in a number of industrial countries, the pattern of inflation, unemployment, output, and budget deficits indicates that partisan policy making is a fairly widespread phenomenon, with more limited evidence that electoral preoccupations result in major fluctuations".[31] Not only have partisan effects been found by many authors at the national level (Winer, Tofias, Grofman and Aldrich, 2008), but partisanship has also been found at state and provincial levels (Besley and Case, 2003; Kneebone and McKenzie, 2001). Of growing interest is the emergence of a wider political spectrum than simply left/right ideology for

[31] However, see Heckelman (2006) who challenges the statistical tests used most often to test for rational partisanship.

partisanship. For example, Brauninger (2005) broadens the partitioning of partisanship from the left /right distinction usually used to ask whether program preferences more generally differ across political parties in ways that are sufficient to generate a spending cycle. His results suggest that more subtle dimensions of partisanship can play a role in generating predictable party influences on policy and/or output. Similarly, Solé-Ollé and Sorribas-Navarro (2008) use coordination cost arguments such as those used by Abrams and Iossifov (2006) to document partisanship in intergovernmental transfers (for Spain). Finally, in an interesting application of DSGE-type analysis to these public choice issues, Blomberg and Hess (2003) modify a real business cycle model to include both partisan and competency effects and generate characteristic variable movements that conformed (better than did the model without these elements) to post-WWII US data.

While opportunism and partisanship have occupied most empirical attention, the relationship between political competition and economic outcomes has had a long history in public choice and this intersects with the short run by raising the question of whether the degree of political competition matters for the extent and/or design of fiscal policy. That is, not only is political competition needed to align political incentives with household demands in relation to long run government size, but political competition may police rent seeking in the scaling of policies designed to respond to the business cycle.[32] In partial answer, greater political competition has been found to provide a greater the degree of transparency in decision making allowing for more informed monitoring of government actions (Alt, Lassen and Rose, 2006). This may be one of the underlying factors behind the finding by Besley, Persson, and Sturm (2005) that greater political competition was essential for promoting the enhanced economic performance of the southern US states by producing higher qualitative choices among policies, policy instruments and governors.[33] Looking more narrowly at government spending, Ferris, Park and Winer

[32] See Svaleryd and Vlachos (2009) who find evidence of rent-seeking falling with greater electoral competition in Sweden.

[33] Similar effects have been found by Padovano and Ricciuti (2009) for Italy and Rumi (2009) for Argentina.

(2008) find evidence in Canada that political competition is a significant explanatory variable in both long and short run dimensions of fiscal policy. There a smaller electoral victory margin (the measure of political competition) is associated not only with a smaller sized government but also with less spending variation about that smaller size (independent of party type).[34] The latter finding is reinforced by studies such as Galli and Padavano (2002) who find that the sizes of fiscal deficits respond to the degree of government fragmentation (another measure of competition) and Skilling and Zeckhauser (2002) who study differences in debt accumulation between the US and Japan and conclude that political competition encourages fiscal prudence. Finally, other economists have investigated the relationship between political competition and partisanship. Both Solé-Ollé (2006) for Spain and Dubois, Prince and Paty (2007) for France find that greater political competition reduced the degree of partisanship found in fiscal choices.

iv. Measurement Issues for testing hypotheses the role of Politics in Fiscal Policy

The key difficulty in testing hypotheses that relate economic and political variables such as those discussed above is that economic variables typically grow through time while political/electoral variables usually do not. Hence one would not expect a stationary or I(0) political variable (like partisan party type or an election date) to be able to provide a meaningful economic or statistical explanation for a trending or non-stationary I(1) economic variable (like GDP or government size). In order to apply the test procedures typically used in statistical analysis, political variables need to be related to stationary economic measures. The testing of political influence in relation to either short run fiscal policy and/or economic growth would then seem to present less of a concern because the measures used to describe fiscal policy allow alike stationary variables to be juxtaposed in a meaningful statistical manner.

[34] See also Dickson (2009).

Hence if the stationary variables used to measure concepts like fiscal policy and the business cycle were unique and unambiguous, a test of political influence on fiscal policy would be relatively straightforward. However because fiscal intervention arises as a departure in expenditure or taxation from long run equilibrium size and because the cycle itself represents a variation in output/growth, employment, or inflation rates relative to its longer run equilibrium, the measures of fiscal intervention and the cycle cannot arise independent of a theory of their long run size. It follows that to test hypotheses that relate political variables to either the scale of fiscal intervention or the business cycle, longer run equilibrium values must be removed from time series data.

In practice nonstationary variables are transformed into stationarity variables either by deterministic detrending, by taking a first difference, or by using a filtering technique such as the Hodrick-Prescott (HP) filter. The separately transformed variables are then tested against each other. Unfortunately, the three techniques do not often generate the same measure of fiscal policy or even imply the same stage of the business cycle. An example of the differences that can arise among the different measures is illustrated below for the case of the logarithm of Canadian real GNP (between 1870 and 2009).[35] By inspection it apparent that the resulting cycles are not coincident and that the use of different detrending techniques can result in different measured relationships. What is worse is that the mechanical use of a detrending technique can itself produce spurious cycles in the detrended data (Harvey and Jaeger, 1993), a particular issue when the HP filter is used on time series that are difference stationary (Cogley and Nason, 1995). While tests exist to distinguish between trend and difference stationary time series and hence point to the appropriate detrending technique, in many cases the lack of power in these tests means that it is often difficult to distinguish between them.

insert Figure 1 about here

[35] Note that all three time series are I(0) with ADF statistics of -3.05 for the deviation from time trend, -6.60 for first differences and -8.03 for HP cycle. The critical value of the Mackinnon test statistic at 1% is -2.58.

From a public choice perspective, the important reason why long run government size has not remained stationary through time is because the factors underlying and so determining long run size have changed, sometimes systematically and sometimes more dramatically. This is the premise of models built to explain the growth of government and/or its pattern of evolution through time (Borcherding, 1985; Kau and Rubin, 1981; Ferris and West, 1996). It follows that an alternative way to filter the long run from time series that combine both is to explicitly model the long run relationship. To the extent that the two sets of considerations are separable and a long run model can be identified, the subtraction of the long run estimate from the aggregate measure would result in a short run series purged of predictable long run variations. More accurately, the procedure would generate a short run cycle contingent on the theory utilized to isolate the long run.

The empirical implementation of this approach requires both a theory of government size and cointegration analysis. For example, public choice theory suggests a number of variables that would serve as proxies for the changes in tastes and composition of the electorate underlying the demand for government services and for the changes in technology/organization that have altered the cost of providing government services (and/or collecting taxes). By and large these variables are nonstationary so that regressing them against government size raises the likelihood that the resulting estimates and implied relationships will be spurious. However cointegration theory tells us that if a linear combination of these nonstationary variables is stationary, then that set of variables will form a cointegrating relationship and the equation estimate can be interpreted as a long run equilibrium relationship among these variables. The residuals of this equation must (by definition) be stationary and as such represent only transitory departures from the long run equilibrium relationship embodied in the cointegration equation. It follows that the residuals become a measure of short run fiscal intervention and random disturbances that can be used both to test theories of fiscal response to the business cycle and to test

for the response (or lack thereof) to the I(0) measures of political opportunism, partisanship and/or political competition.[36]

One example of the difference between the residuals generated by a cointegration model of long run size and the residuals arising from the use of a Hodrick-Prescott trend is illustrated below for case of the log of real per capita government (expenditure) size over the post WW2 period in Canada.[37] As that figure illustrates, the measures are not dissimilar but do contain some significant differences in size and timing. The case for using cointegrated residuals is that unlike the HP residuals, cointegration residuals are generated with the use of more relevant information than the just the internal characteristics of the series itself and thus have a an interpretable meaning that allows for potentially more insightful interpretations with respect to the short run. Cointegration residuals have then been used together with first differences in an error correction model to represent a more precise description of the systematic process of short run adjustment about long run size.

insert Figure 2 about here

Finally a recurring theme of this paper has been that the short and long run reasons for government spending/taxation interrelate both conceptually and within the same measure. This suggests that rather than using a long run theory to separate the time series into two distinct parts and testing the two types of theories separately, the two hypotheses should be tested together on the data. This can be done by combining the separate stages of the Engel-Granger error correction model and estimating the long run model of government size at the same time the transition process about the long run equilibrium is estimated.

5. Conclusion

[36] Note that the definition of fiscal policy here includes endogenous as well as exogenous responses to the business cycle. As such it captures a much broader definition of fiscal response than does the measure isolated in SVARs.

[37] The model uses the cointegration relationship used in Ferris, Park and Winer (2008) estimated over the 1948-2008 time period.

In this paper I have focused on how public choice intersects traditional macro analysis both in relation to the determination of long run government size and in relation to the business cycle. By focusing on macroeconomic concerns, however, this approach has been unable to do justice to the public choice literature concerned with the consequences for fiscal policy of differences in electoral processes and/or political party structures among and across groups of countries (e.g., Efthyvoulou, 2008 and Redzepagic and Llorca, 2007). Similarly little attention has been given to the rapidly growing literature on the significance for policy of particular differences in the institutional and organizational structure of decision-making within the bureau (e.g., Besley and Persson, 2009). Instead the analysis has focussed on how traditional public choice considerations such as partisanship, opportunism and political competition intersect with the measure of traditional countercyclical macroeconomic policy and the different techniques used within macro to address traditional public choice concerns. The particular concern of this paper has been to highlight the issues involved in measuring the scale and intensity of short run fiscal intervention and the analytic problems raised by having long run policies related to size and shorter run policies related to stabilization combined in a single fiscal measure. It reflects the belief that unless there is a greater recognition of the issues involved in measuring short run fiscal intervention it will be difficult to establish any consensus on the scale of actual government intervention that arises at any particular point in time. Without this there will be even less chance of agreeing on the effect (or lack of effect) of different fiscal stimuli on the business cycle.

Figure 1

Alternative Cycles in the Log of Canadian real GNP

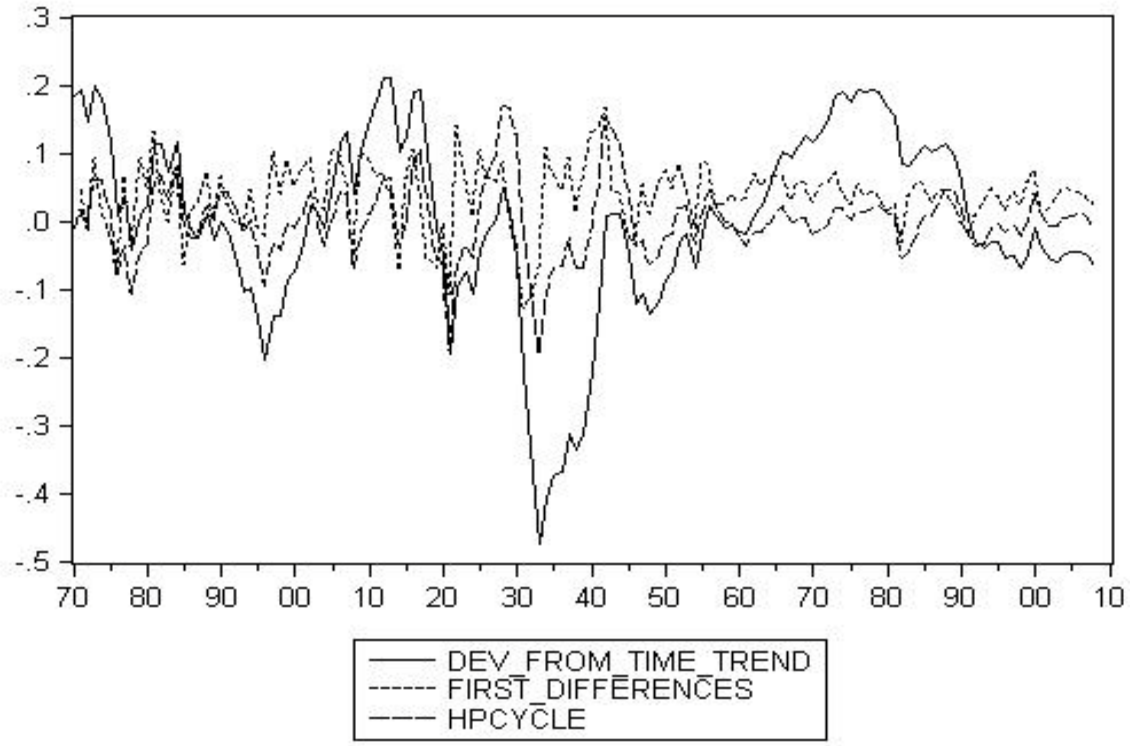
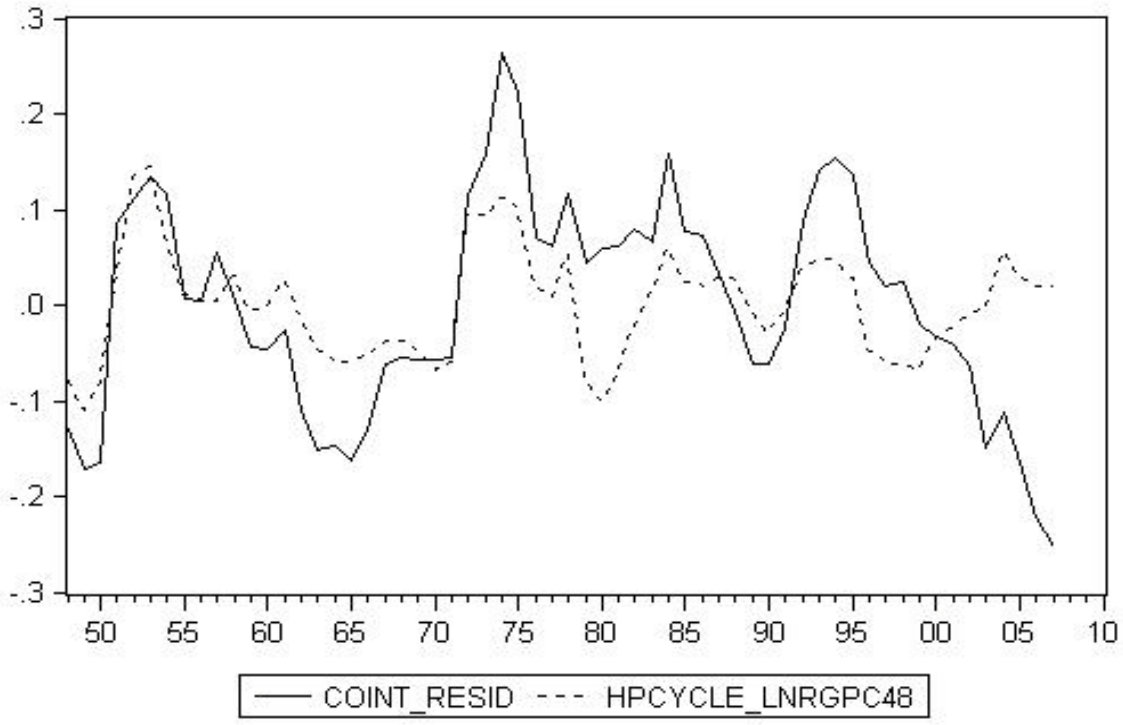


Figure 2

Alternative Measures of Fiscal Intervention as a Fraction of GDP: Canada 1948-2008



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