Public Spending, Quality of Bureaucracy and Economic Growth: A Theoretical Analysis

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This paper develops a theoretical framework to investigate the relationship between public spending and economic growth, where public spending provides both productive capital and unproductive services. We take into account the quality of bureaucracy with the possibility of rent-seeking motives. A key feature of the model is that it distinguishes between utility enhancing and productivity enhancing public spending. In the absence of rent-seeking motives, the paper demonstrates that public spending will promote economic growth only if marginal productivity of spending is high enough to offset the potential output loss due to increased taxation. In the presence of rent-seeking, however, the impact of public spending on economic growth depends on the quality of bureaucracy and how the latter impinges upon the rent-seeking behaviour. The analysis shows that while improvement in bureaucratic quality would unambiguously raise the share of utility enhancing public spending, its impact on economic growth would depend on how bureaucratic quality influences the relative magnitudes of the two types of public spending as well as on how far bureaucratic extraction will be controlled as a result of improvement in bureaucratic quality. Bureaucratic extraction is likely to be minimised with strong institutions and effective monitoring and accountability mechanisms thereby improving the prospects of economic growth.

1. INTRODUCTION

The role of public spending in the process of economic growth has received a great deal of attention in the literature [see, for example, Barro (1990); Barro and Sala-i-Martin (1992); Devarajn, Swaroop, and Zou (1996); Easterly and Rebelo (1993); Glomm and Ravikumar (1997) and Ghosh and Mourmouras (2002)]. Most of the studies, however, ignore bureaucratic quality and the possibility of rent-seeking that is linked with public spending and provision of public goods. It is well known that public spending programmes can be used as a vehicle for rent-seeking which can adversely impact the effectiveness of public spending and hurt economic growth [see, for example, Gupta, Davoodi, and Tiongson (2000); Johnson, Kaufman, and Zoido-Lobatan (1999); Mauro (1998) and Tanzi and Davoodi (1997)]. Our starting point in this research is to argue that the effectiveness of public spending depends crucially on the quality of bureaucracy that is responsible for administering the public spending programmes.[1] If bureaucracy is

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[1]According to Acemoglu (2005) bureaucratic quality is one of the most important factors determining the overall quality of governance in an economy. Acemoglu (2005) argues that the nature of government determines whether it is creating positive externalities or extracting from the society.

efficient with proper incentives for performance, it will tend to adopt public spending policies that can promote economic growth. On the other hand, as is commonly observed in many developing economies, if the bureaucracy lacks effective checks and balances on its performance, then the consequent lack of accountability makes government officials prone to abuse of power and rent-seeking from public spending projects which ultimately impede the process of economic growth.[2]

The aim of this paper is to explore the relationship between public spending and economic growth while taking into account the quality of bureaucracy with the possibility of rent-seeking behaviour. In particular, we develop a theoretical framework that endogenises public expenditure policies in a setting that explicitly incorporates the role of bureaucracy in determining public spending. A key feature of our study is that it makes a distinction between productivity enhancing and utility enhancing public spending.[3] The two types of public spending may have different implications for economic growth for at least two reasons. First, the two types of spending may influence productivity in different ways and thus may have different impacts on economic growth. For example, Devarajan, *et al.* (1996) find that growth increases with an increase in the current expenditures of the government while it declines with an increase in the stock expenditures of the government. This result questions the policy of giving more attention to capital expenditures rather than current expenditures especially in the context of developing economies. It is noteworthy that previous work has mainly focused on productivity enhancing expenditures and largely ignored the utility enhancing expenditures. In this respect, our study makes an important contribution to the literature by incorporating the two types of spending in a rigorous growth framework.[4] Second, the two types of public spending may entail different incentives for the bureaucracy in terms of opportunities for rent-seeking resulting in different growth outcomes. For example, if bureaucratic extraction takes place in utility enhancing expenditures, growth may still be achievable if substantial resources are allocated to the productivity enhancing expenditures. So this type of extraction may be less harmful for the economy. On the other hand, however, if bureaucratic extraction takes place in productivity enhancing expenditures, it may have deleterious consequences for economic growth by stifling private activity.

The analysis provides insights into how rent-seeking behaviour may impact growth outcomes of public spending programmes. In particular, the analysis points out what type of bureaucratic extraction would be more harmful for economic growth.[5] For example if extraction takes place in utility enhancing expenditures then welfare of the

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[2]Keefer (2004) argues that in economies with bad governance, public spending is not deployed productively and is rather often used as an instrument for maximising rents by bureaucrats. So even if public spending is high in such economies, it does not necessarily mean that it is growth promoting because it may be wasted on non-productive activities.

[3]Productivity enhancing expenditures include spending on public goods such as physical infrastructure while utility enhancing expenditures include social security programmes, income transfer programmes, and health and education spending.

[4]In the growth literature, the famous optimising models of Ramsey (1928), Cass (1965) and Koopmans (1965) are aimed at studying the required savings rate to put the economy on a balanced steady state growth path. However, these models are silent on the role of composition of public expenditures on economic growth.

[5]Some studies have argued that exclusive focus on overall public spending does not fully capture the bureaucratic rent-seeking in public spending policies as different types of public spending may entail different rent-seeking opportunities [Aberbach and Rockman (1976); Bendor and Moe (1985)].

citizens may be compromised while growth may still be achievable through productivity enhancing expenditures. On the other hand, rent-seeking opportunities in productivity enhancing expenditures may hamper economic growth by raising transactions costs of the private enterprises.

The rest of the paper is organised as follows. Section 2 provides a brief review of literature. Section 3 develops the model while Section 4 discusses the key implications of the model considering a benchmark case when public spending is taken as exogenous and there is no rent-seeking. Section 5 introduces bureaucratic choice in the model to endogenise the composition of public spending in terms of bureaucratic quality and the associated issue of rent-seeking. Section 6 provides summary and conclusions. The appendix provides detailed derivations.

2. REVIEW OF LITERATURE

The literature that deals with the question of public spending and economic growth can be broadly classified into neoclassical/endogenous growth models, and the new institutional approach.[6] The neoclassical and endogenous growth models pay scant attention to the material self-interest of key actors (e.g. bureaucrats) involved in the policy-making process. The new institutional approach takes into account the incentives and constraints faced by these actors that influence the public spending outcomes. This section provides an exposition of the literature in particular on two thematic areas including public choice and bureaucracy and institutional quality.

Starting from the seminal work of Arrow and Kurz (1970), the growth literature in the tradition of neoclassical and endogenous growth models provides robust evidence of positive link between economic growth and public spending. In the neoclassical tradition, some authors follow Devarajan, *et al.* (1996) and explore the link between public expenditures and economic growth in a growth framework that distinguishes between productive[7] and unproductive[8] expenditures [Chen (2006); Ghosh and Roy (2004); Carboni and Medda (2011)]. These studies analyse optimal composition of government expenditures in a setting where public expenditure is composed of two types—one leads to growth and the other leads to welfare—and investigate which composition is optimal to maximise the long-run growth rate [Turnovsky (2000a)]. However, the growth literature pays scant attention to the quality of bureaucracy duly taking into account the rent-seeking motives which may contribute to wasteful public spending.

In a departure from the neoclassical tradition, an influential strand of literature incorporates self-interest motives that determine the constraints and incentives faced

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[6]Early neoclassical growth models envisaged no role of public expenditures in economic growth and instead emphasised savings rate and physical capital accumulation as the main drivers of economic growth [Ramsey (1928); Cass (1965); Koopmans (1965); Solow-Swan (1956)]. Arrow and Kurz (1970) first described the scope of fiscal policy within the neoclassical framework and since then a vast body of literature has explored the linkages between public spending and economic growth emphasising a variety of transmission channels [Barro (1990); Barro and Sala-i-Martin (1992); King and Rebelo (1990)]. While the theoretical literature generally predicts a positive relationship between public spending and economic growth, the empirical studies have found mixed results.

[7]See, for example, Barro (1990).

[8]Some studies argue that public consumption expenditures are always unproductive and hence resources should be allocated to physical capital alone. See, for example, Barro (1990), Barro (1991), Aschauer (1989) and Grier and Tullock (1989).

by key actors including politicians and bureaucrats who are responsible for devising and implementing public spending policies [see, e.g. Buchanan (1968); Carpenter (2001); Milward (1980); Rochefort and Cobb (1994)]. Following the seminal work of Tullock (1967) who first introduced the idea of rent-seeking, Krueger (1974) describes rent-seeking as the behavior of public officials acting as self-interested economic agents who try to maximise their individual gains which results in social losses. Pursuing this line of inquiry, the public choice paradigm explores how bureaucrats who are responsible for the implementation of public spending policies can be involved in rent-seeking activities[9] [see, e.g. Hillman (2003), Chapter 6; Mueller (2003), Chapter 15, for a survey of rent-seeking literature]. Furthermore, dynamic growth models based on public choice approach provide insights into how public spending may lead to negative growth outcomes in the presence of rent-seeking behaviour.[10] A key point of this line of research is that inefficiencies may be explained by maximisation of personal gains[11] by public agents [Mises (1944); Parkisnson and Osborn (1957) and Niskanen (1971)].

Following the arguments of Niskanen (1971), budget-maximising bureaucracy is shown to result in an overprovision of public goods,[12] as bureaucrats try to maximise the size of budget. It follows that the growth framework with productive public spending in the presence of rent-seeking bureaucrats would result in sub optimal provision of public goods.[13] Dethier (1999) departs from the conventional view of government officials as benevolent who seek to maximise social welfare to argue that government agencies are complex entities characterised by agency relationships. Efficient utilisation of public resources not only depends on the quality of institutions but also on incentive schemes in public organisations. Therefore, reforms need to be focused on designing appropriate incentive schemes that ensure effective implementation of policies so as to maximise social welfare. Such reforms would also ensure good governance that in turn would lead to better growth outcomes supported by physical and human capital accumulation and efficiency in the use of resources. Niskanen (1968) develops a model of the bureaucracy in which bureaucrats enjoy absolute powers and use their power to maximise their budget resulting in outcomes that are suboptimal from a social point of view.

Several studies have extended Niskanen's budget maximisation framework to incorporate more nuanced approaches for modelling the budgetary allocations, emphasising in particular the discretionary powers of bureaucracy [see, for example, Breton and Wintrobe (1975); Romer and Rosenthal (1978); Mackay and Weaver

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[9]See, for example, Evans (1989), Weingast and Moran (1983), Epstein and O'Halloran (1999), and Keefer and Stasavage (2003). McNubbis, Noll, and Weingast (1987) describe in detail the bureaucratic discretion imposed by the US Congress through the Administrative Procedures Act.

[10]Public choice literature that emphasises rent-seeking originated with the works of Buchanan and Tullock (1962) and Olson (1971).

[11]See Mueller (1989).

[12]Earlier studies that investigate the issue of overprovision of public goods include Orzechowsky (1977), Breton and Wintrobe (1975), Tullock (1965), and Romer and Rosenthal (1978).

[13]Some authors have highlighted the potentially positive impact of rent-seeking on public goods provisions. For example, Rose-Ackerman (1996) notes that in the presence of rent-seeking opportunities, public officials are more motivated to maximise gains from public projects and thus generate aggregate benefit for the overall society.

(1981); Miller and Moe (1983); Conybeare (1984); Bendor, Taylor, and Van Gaalen (1985) and Bendor and Moe (1985, 1986)]. In an influential contribution, Migue and Belanger (1974) develop a model of bureaucratic discretion and argue that bureaucrats maximise their budget leeway, defined as the total budget less the cost of production of the bureau's output. It is shown that the equilibrium output may range from the level of a profit-maximising monopolist to that of an output maximising bureau, depending on the bureaucrat's utility from productive and non-productive spending. In any case the budget of a bureau is too large and the output is not produced at the minimum cost.

The problem of rent-seeking in public spending programmes varies across sectors. Mauro (1998) argues that corrupt officials will choose to spend public resources on activities with greater opportunities to extract bribes. The study finds that rent-seeking reduces public expenditures on education as such spending is often more transparent leaving little room for public officials to engage in extractive practices. Building on the same line of argument Tanzi and Davoodi (1997) find that higher rent-seeking is related to higher public investment, lower government revenues, lower expenditures on operations and maintenance, and lower quality of public infrastructure. Moreover, rent-seeking is likely to increase the number of large and more complex public investment projects because of greater rent-seeking opportunities associated with such projects. This is because more complex expenditures cannot be easily scrutinised by the public thus providing better opportunities to extract rents. The same argument holds for defense spending which is kept away from public scrutiny purportedly for security reasons.[14]

Besides bureaucratic quality, the distortion in fiscal policy and development budgets can originate from many sources such as the nature of the political process, lack of transparency, and low level of public awareness of the budgetary process. A number of studies in the political economy literature have emphasised the role of the political process in generating sub-optimal public spending outcomes [Alesina and Perotti (1995); Eslava (2006)]. Furthermore, the politico-institutional approaches show that even in the democratic countries with accountable bureaucracy, distortions in the public spending can stem from lack of awareness by the voters that makes it easy for the bureaucrats to seek rents. This point has been highlighted, in the context of Pakistan, by Uppal (2011) who examines political institutions and budgetary processes that affect the fiscal policy, and shows how greater transparency and strong institutional checks and balances can encourage fiscal discipline [Ghani and Din (2006); Easterly (2001)].

To sum up, a rich body of literature has explored the role of public spending on economic growth. However, the quality of bureaucracy and the associated problem of rent-seeking have received little attention in the theoretical discussions that link efficiency of public spending to economic growth. Adding to this stream of research the present paper aims at investigating the impact of rent-seeking behaviour of bureaucrats on public policy outcomes, when it is assumed that public spending is composed of utility enhancing and productivity enhancing expenditures. In the next section, we propose a simple theoretical framework to explain how the quality of bureaucracy and the presence of rent-seeking motives may impinge on growth outcomes of public spending policies.

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[14] See also Gupta, Mello, and Sharan (2001) for a similar argument.

3. A FORMAL ANALYSIS OF PUBLIC SPENDING COMPOSITION AND QUALITY OF BUREAUCRACY

The model is an extension of Devarajan, *et al.* (1996) in two ways. First, in contrast to Devarajan, *et al.* (1996) who distinguish between productive and non-productive expenditures in the production function, our study focuses on utility enhancing and productivity enhancing public expenditures and examines how this composition of public spending impacts economic growth. Second, while Devarajan, *et al.* (1996) treat public spending as exogenous, our study incorporates bureaucratic choice in the model so that public spending policies are endogenously determined. The model developed here provides a simple framework to study the determination of sectoral composition of public expenditures and their impact on growth and welfare in the presence of rent-seeking bureaucracy.

A representative infinitely lived household in a closed economy maximises:

$$U = \int_0^\infty u(c, g_u)e^{-\rho t}dt \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (1)$$

Where c is per capita consumption, g_u is per capita public spending on utility enhancing goods and services, and $\rho > 0$ is the constant rate of time preference. Population is assumed constant.

Let the utility function be additively separable and logarithmic:[15]

$$u(c, g_u) = \ln c + v \ln g_u \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (2)$$

Where $v \geq 0$ measures the weight given to public consumption relative to private consumption.

Each household producer has the production function:

$$y = f(k, g_p) \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (3)$$

Where y is output per capita, k is private capital per capita, and g_p is per capita public spending on productivity enhancing goods and services. We assume such public goods and services are provided free of charge and there is no congestion. Following Barro (1990), the production function in the paper represents government expenditures as a public good into the production process. Here the idea is that public good characteristics of public expenditures raise productivity and hence boost economic growth. In the literature on public spending, both approaches are used by researchers treating public expenditures as stock variable[16] [Futagami, *et al.* (1993) or flow variable[17] [Barro (1990)] that directly raises the marginal product of capital. More specifically, the public expenditures are described as public capital and treated as stock variable where these expenditures solely represent infrastructure, which affects marginal product of private capital. In our case, we use public spending to represent the availability of productivity enhancing public goods and hence the use of flow variable is more appropriate. Furthermore, if the public expenditures are introduced as stock variables then the analysis becomes more complex as it would

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[15]See, Park and Philippopoulos (2005).

[16] See for example, Fisher and Turnovsky (1998), Rioja (1999), Rivas (2003), Turnovsky (2004), and Agénor (2012).

[17]See for example, Rebelo (1991), Glomm and Ravikumar (1994), Turnovsky and Fisher (1995), Turnovsky (2000a).

require the introduction of an additional variable such as expenditures on maintenance of stock of public capital. It is mostly believed that the tradeoff between stock and flow variable treatment of public expenditures is more of a choice between analytical tractability and scope of research. Furthermore, flow and stock treatment have been shown to yield empirically similar results in most cases [Posada, *et al.* (2015)].

The production function is assumed to be Cobb-Douglas which can be written as:

$$y = k^{\alpha}.g_p^{1-\alpha} \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (4)$$

We assume that government expenditure on the two types of public expenditures is financed contemporaneously by a flat-rate income tax:

$$\tau y = g_u + g_p \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (5)$$

Where τ is tax rate.

Now let $\theta_p = {g_p}/{y}$ and $\theta_u = {g_u}/{y}$ be the shares of productivity enhancing expenditure and utility enhancing expenditure respectively in national output. Then the budget constraint can be written as:

$$\tau = \theta_p + \theta_u \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (6)$$

Taking τ, g_u and g_p as given, the representative agent chooses consumption c and capital k to maximise:

$$\text{Max} (\ln c + v \ln g_u) e^{-\rho t} dt \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (7)$$

$$\text{Subject to } \dot{k} = (1-\tau).k^{\alpha}.g_p^{1-\alpha} - c \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (8)$$

Where Equation (8) defines investment as after-tax output less consumption. Solving the optimisation problem using optimal control methods yields the following growth equation of the economy.

$$\gamma = [\,\alpha.\left(1 - \theta_p - \theta_u\right).\left(\theta_p\right)^{1-\alpha/\alpha} - \rho] \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (9)$$

According to Equation (9), the growth rate depends on the output elasticities with respect to private capital and public good, composition of public spending, and discount rate.

4. A BENCHMARK CASE WITH NO RENT-SEEKING

For comparative purposes, we first examine a benchmark case when the composition of public spending is exogenous and there is no rent-seeking. First, we explore the impact of an increase in the ratio of productivity enhancing public spending on economic growth. Differentiating Equation (9) with respect to θ_p:

$$\frac{\partial \gamma}{\partial \theta_p} = (1-\tau).(1-\alpha).\theta_p^{1/\alpha} - \alpha.\theta_p^{1-\alpha/\alpha} \qquad \dots \qquad \dots \qquad \dots \qquad (10)$$

Slight manipulation shows that:

$$\frac{\partial \gamma}{\partial \theta_p} > 0 \text{ if } (1-\tau).(1-\alpha).\theta_p^{-1} > \alpha \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad (11)$$

Where $(1-\tau).(1-\alpha).\theta_p^{-1}$ is the after tax marginal product of productivity enhancing goods and services and α is the output elasticity of capital.

Proposition 1: An exogenous increase in the share of productivity enhancing public spending will have a positive impact on economic growth as long as the after tax marginal product of productivity enhancing goods and services is greater than the output elasticity of capital.

An increase in productivity enhancing spending directly raises the productive capacity of the economy which contributes positively to economic growth. However, as the share of utility enhancing spending is held constant, an increase in the share of productivity enhancing spending necessitates an increase in the tax rate which reduces output and hence capital. So as long as the contribution of the productivity enhancing spending outweighs the loss in output caused by decline in capital, economic growth would increase. This result has an important implication. Even if public spending is concentrated on productivity enhancing goods and services, economic growth would only accrue when the contribution of such goods and services in terms of their marginal productivity is high enough so as to outweigh potential loss of output as a result of increase in taxation. This implies that government may have to prioritise its spending in terms of allocating budget to those public goods and services which have the highest potential to raise productivity. For example, the government may choose to invest in physical infrastructure such as roads, railways and bridges as such investments are likely to substantially raise productivity and hence boost economic growth. Similarly, public spending on education and health may significantly boost productivity and hence economic growth.

The theory suggests that the public expenditures have both short run demand effects as well as long run supply effects. However the magnitude of these effects depends on many factors such as efficiency of public investment that affects the long run elasticity of output with respect to public expenditure and how public spending is financed such as taxes.

By explicitly referring to these magnitudes the proposition (1) suggests that beyond the share of public expenditures the government also controls other policy instruments such as tax rate which govern the total size of public intervention in the spirit of Devarajan, *et al.* (1996). These results essentially describe how the growth effects of public good provision may be mediated by the changes it induces in marginal productivity of capital and its magnitude in relation to the elasticity of capital.

Next, we differentiate Equation (9) with respect to θ_u to obtain:

$$\partial\gamma/\partial\theta_u = -\alpha.\theta_p^{1-\alpha/\alpha} < 0 \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \quad (12)$$

Proposition 2: An exogenous increase in the share of utility enhancing public spending will have a negative impact on economic growth.

The above result follows from the fact that an increase in utility enhancing spending does not add to the productive capacity of the economy but has to be financed by taxes which negatively affect the growth rate.[18] Furthermore, the impact on growth

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[18] In a similar vein, Barro (1990) argues that government consumption necessitates higher taxes which introduce distortions in the economy and hence negatively impact economic growth. See also Grier and Tullock (1989).

rate will be more pronounced the higher is the output elasticity of capital. This result serves to underscore the fact that the impact of public spending on economic growth depends on the type of public spending which must be taken into account while analysing public spending-growth nexus. In contrast to the counterintuitive findings of Devarajan, *et al.* (1996) which suggest that switching public spending from investment to consumption would promote economic growth, our result is more plausible and captures the idea that consumption related public spending would hamper economic growth by pulling resources away from productivity enhancing public investments, a point also highlighted by Gupta, *et al.* (2001).

5. PUBLIC SPENDING, BUREAUCRATIC QUALITY AND RENT-SEEKING

We now introduce the bureaucratic choice to endogenise the composition of public spending in terms of bureaucratic quality and the associated issue of rent-seeking. We assume that a representative bureaucrat chooses the composition of public spending to maximise the following weighted utility function:

$$\text{Max } u_g = \pi.(\ln c + v \ln g_u) + (1 - \pi).(\varrho(\pi).g_p) \quad \dots \quad \dots \quad \dots \quad (13)$$

$$\text{Subject to } \tau y = g_u + g_p \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (14)$$

Where $\ln c + v \ln g_u$ is the utility of the representative consumer, the parameter π captures bureaucratic quality, and $\varrho(\pi)$ is the proportion of g_p extracted by the bureaucrat as rent which is assumed to be a function of bureaucratic quality. We assume that the extent of rent-seeking declines with the bureaucratic quality and hence $\varrho_\pi < 0$. We suppose that $\pi \in (0,1)$ with higher values of π reflecting better quality of bureaucracy. The higher is the bureaucratic quality, the higher is the weight attached to the maximisation of social welfare by the bureaucrat. On the other hand, with weak institutions the bureaucracy is likely to be geared less towards maximisation of social welfare and more towards rent-seeking activities. We assume that only productivity enhancing spending is prone to rent-seeking. This is plausible because spending on physical infrastructure is often non-transparent and complex creating possibilities for rent-seeking.[19] On the other hand public consumption expenditures such as wages and salaries are quite transparent and offer little chance for rent-seeking. The solution of the above optimisation problem yields the following values for g_u and g_p:

$$g_u = {}^{\pi.v}\!/_{(1 - \pi).\varrho(\pi)} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (15)$$

$$g_p = \tau y - {}^{\pi.v}\!/_{(1 - \pi).\varrho(\pi)} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (16)$$

Slight manipulation yields:

$$\theta_u = {}^{\pi.v}\!/_{y.(1 - \pi).\varrho(\pi)} \quad \dots \quad \dots \quad \dots \quad \dots \quad \dots \quad (17)$$

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[19]This assumption also lends analytical tractability to the model by simplifying the analysis. While relaxing these assumptions may change the inner dynamics of the model with more complex derivations, it will likely not change the major thrust of the theoretical arguments and overall direction of the conclusions.

$$\theta_p = \tau - \frac{\pi.v}{y.(1-\pi).\varrho(\pi)} \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \quad (18)$$

It is clear from Equations (17) and (18) that for a given level of income, both θ_u and θ_p are functions of bureaucratic quality directly as well as indirectly through its influence on rent-seeking, i.e.:

$$\theta_u = \theta_u(\pi, \varrho(\pi)) \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \quad (19)$$

$$\theta_p = \theta_p(\pi, \varrho(\pi)) \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \qquad \cdots \quad (20)$$

The above equations can be used to derive the following result (see Appendix for detailed derivations).

Proposition 3: *An improvement in bureaucratic quality will increase the share of utility enhancing public spending while squeezing the share of spending on productivity enhancing goods and services.*

With strong institutions and better quality bureaucracy, the policy-makers would be more inclined to maximise social welfare and thus public spending will be tilted towards public goods and services that lead to maximisation of social welfare. In this case, public spending will be channelled more into utility enhancing public goods and services because these entail no rent-seeking and raise the level of welfare. On the other hand, with weak institutions and poor accountability the opportunity cost of extracting rents is low so bureaucrats have an incentive to allocate public spending towards those expenditures that maximise rents rather than social welfare. In this case, since productivity enhancing public spending is prone to rent-seeking, such spending will increase to maximise rents. Similarly, more rent-seeking opportunities will curtail utility enhancing spending and expand public spending on productivity enhancing goods and services.

How do these impacts translate into changes in economic growth? To see this, we plug Equations (19) and (20) in the growth Equation (9) to obtain:

$$\gamma = [\, \alpha.\big(1 - \theta_p(\pi, \varrho) - \theta_u(\pi, \varrho)\big).\big(\theta_p(\pi, \varrho)\big)^{1-\alpha/\alpha} - \rho] \qquad \cdots \qquad \cdots \quad (21)$$

Now we can investigate how variations in the parameters of bureaucratic quality and rent-seeking impact economic growth through their impact on the composition of public spending (see Appendix for detailed derivations).

Proposition 4*: The impact of an improvement in bureaucratic quality on economic growth depends on the relative magnitudes of changes in the shares of utility enhancing and productivity enhancing spending resulting from an improvement in bureaucratic quality.*

The above result shows the importance of explicitly recognising the role of bureaucratic quality in the process of economic growth. It is generally believed that an improvement in bureaucratic quality will be beneficial for economic growth. However, our results show that this may not be necessarily the case because bureaucratic quality and the associated problem of rent-seeking affect the composition of public spending in different ways which may result in different implications for economic growth. To see this, observe that the impact on economic growth is composed of two opposing forces. On the one hand, there is an *allocation effect* whereby an improvement in bureaucratic

quality leads to an increase in the share of utility enhancing spending and a reduction in productivity enhancing spending both of which constrain economic growth. On the other hand, an improvement in bureaucratic quality leads to an *efficiency effect* which reduces the bureaucratic extraction in the productivity enhancing spending thus freeing up resources that can be deployed for increasing production which spurs economic growth. So the net impact of an improvement in bureaucratic quality on economic growth depends on the relative magnitudes of changes in the two types of public spending. More importantly, the impact of bureaucratic quality on economic growth depends on how strongly an improvement in bureaucratic quality curtails the incentives for rent-seeking. For example, strong institutions and robust mechanisms for monitoring and accountability can be very effective in checking the rent-seeking behaviour, as argued by Uppal (2011) in the case of Pakistan. In this case, an improvement in bureaucratic quality will be likely to produce favorable growth outcomes. In contrast, as argued by Kimenyi and Tollison (1999), weak institutions may permit diversion of resources to wasteful rent-seeking activities thus contributing to adverse public policy outcomes.

A significant body of literature emphasises the role of institutional quality in ensuring positive growth outcomes of public policies [see, for example, Acemoglu (2005) and Keefer (2002)]. In economies with good governance and effective checks and balances on institutions, public spending tends to be productively used thus contributing positively to economic growth. However, in economies with bad governance, public spending is not deployed productively and is rather often used as an instrument for maximising rents by bureaucrats and politicians [Keefer (2002)]. The governments tend to be responsive to its citizens in terms of provision of soft public goods such as property rights, and rule of law in countries where institutions are strong and provide right incentives for government officials to cater to the demands of the citizens [Keefer (2004)]. However, in economies with weak institutions rent-seeking opportunities are pervasive and are often linked to the size of public sector [Ott (2005)]. If incentives for rent-seeking are sufficiently high, the size of public investment would be strongly associated with rent-seeking as public officials would have an incentive to undertake public investment to maximise their rents. As our analysis suggests, such investments may be counterproductive if quality of the bureaucracy is low implying strong incentive for rent-seeking in the public sector.

One implication of the model developed in this paper is that rent-seeking governments may actually deliver high economic growth by channeling resources into public investments that offer more rent-seeking opportunities while also raising productive capacity of the economy. However, this can only come at the cost of potential loss in public welfare as resources are diverted from utility enhancing public spending.[20] This issue has been debated in the policy circles as well as in the academic literature and a number of empirical studies show that the link between democratic institutions and economic growth is tenuous [Rioja (1999); Rivas (2003)].

6. CONCLUDING REMARKS

This paper has analysed the relationship between public spending and economic growth by developing a model that explicitly incorporates quality of bureaucracy with the

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[20] The author is thankful to an anonymous referee for highlighting this point.

possibility of rent-seeking behaviour, and that distinguishes between utility enhancing and productivity enhancing public spending. In the benchmark case of no rent-seeking, the paper shows that even when public spending is channelled into productivity enhancing goods and services it may not achieve the desired growth outcomes if the marginal productivity of such spending is low. We show that economic growth would result only if marginal productivity of public spending is high enough so as to outweigh the potential loss of output as a result of increase in taxation. This highlights the need for prioritising public spending and allocating resources to public goods and services that have the potential to raise productivity. In the presence of rent-seeking motives, it is shown that while an improvement in bureaucratic quality would unambiguously raise the share of utility enhancing public spending, its impact on economic growth would depend on how bureaucratic quality influences the relative magnitudes of the two types of public spending as well as on how far bureaucratic extraction will be curtailed as a result of improvement in bureaucratic quality. In cases where bureaucratic reforms create strong institutions and effective monitoring and accountability mechanisms, bureaucratic extraction is likely to be minimised and public spending is more likely to foster economic growth.

A key limitation of the analysis is that rent-seeking is assumed to take place only in productivity enhancing public spending. Though this is a plausible assumption, future work may focus on extending the model to incorporate rent-seeking in the utility enhancing spending on goods and services. Also, though the tradeoff between economic growth and public welfare is not the focus of the paper, maximisation of economic growth by the policymakers at the expense of public welfare is not endorsed by the paper. Finally, we have assumed that bureaucratic quality affects economic growth only indirectly through the composition of public spending. However, bureaucratic quality may also directly affect economic growth through an improvement in overall policy and regulatory environment that may raise total factor productivity in the economy. The model can be extended to incorporate this direct impact in the production function.

APPENDIX

Derivations for Propositions 1 and 2

The optimisation problem can be solved in terms of the current value Hamiltonian which is given by:

$$H = (\ln c + v \ln g_u) e^{-\rho t} + q[(1 - \tau).k^\alpha.g_p^{1-\alpha} - c] \quad \ldots \quad \ldots \quad \ldots \quad (A1)$$

Where $q = \lambda e^{-\rho t}$ $\quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (A2)$

First Order Conditions

$$\frac{\partial H}{\partial c} = (1/c).e^{-\rho t} - \lambda.e^{-\rho t} = 0 \Rightarrow \lambda = 1/c \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (A3)$$

$$\dot{q} = -\frac{\partial H}{\partial k} \Rightarrow \dot{\lambda} e^{-\rho t} - \rho \lambda e^{-\rho t} = -\lambda e^{-\rho t}.[\alpha(1 - \tau).k^{\alpha-1}.g_p^{1-\alpha}] \quad \ldots \quad (A4)$$

Equation (A4) simplifies to:

$$\dot{\lambda} = -\lambda[\alpha(1 - \tau).k^{\alpha-1}.g_p^{1-\alpha} - \rho] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad (A5)$$

Differentiating (A3) with respect to time, we have:

$$\dot{\lambda} = -\dot{c}/c^2 \qquad \qquad \qquad \qquad \qquad \qquad \qquad \text{(A6)}$$

Substituting (A3) and (A6) in (A5), we obtain:

$$\dot{c}/c = \gamma = \alpha(1-\tau).k^{\alpha-1}.g_p^{1-\alpha} - \rho \qquad \qquad \qquad \qquad \text{(A7)}$$

Where γ denotes steady state per capita growth rate of private consumption.

In this model the economy is always at a steady state growth in which all variables c, k and y grow at the rate γ shown in Equation (A7).

Now notice that:

$$g_p = \theta_p.y \qquad \qquad \qquad \qquad \qquad \qquad \qquad \text{(A8)}$$

Substituting (A8) in (A7) we have:

$$\gamma = \left[\alpha.(1-\tau).k^{\alpha-1}.(\theta_p.y)^{1-\alpha} - \rho\right] \qquad \qquad \qquad \text{(A9)}$$

Now notice that:

$$y = k^\alpha.g_p^{1-\alpha} \qquad \qquad \qquad \qquad \qquad \qquad \text{(A10)}$$

Slight manipulation of (A10) yields:

$$y = k.(\theta_p)^{1-\alpha/\alpha} \qquad \qquad \qquad \qquad \qquad \qquad \text{(A11)}$$

Substituting (A11) into (A10), we have:

$$\gamma = [\,\alpha.(1-\tau).k^{\alpha-1}.\theta_p^{1-\alpha}.\left(k.\theta_p^{1-\alpha/\alpha}\right)^{1-\alpha} - \rho] \qquad \qquad \text{(A12)}$$

Simplifying this expression we have:

$$\gamma = [\,\alpha.(1-\tau).\left(\theta_p\right)^{1-\alpha/\alpha} - \rho] \qquad \qquad \qquad \qquad \text{(A13)}$$

On substituting for $\tau = \theta_p + \theta_u$ we have:

$$\gamma = [\,\alpha.\left(1 - \theta_p - \theta_u\right).\left(\theta_p\right)^{1-\alpha/\alpha} - \rho] \qquad \qquad \qquad \text{(A14)}$$

According to (A14), the growth rate depends on the output elasticities with respect to private capital and public good, composition of public spending, and discount rate.

Derivation of Equations (15) and (16) in the Text

Consider the following optimisation problem:

$$\text{Max } u_g = \pi.(\ln c + v\ln g_u) + (1-\pi).(\varrho(\pi).g_p) \qquad \qquad \text{(A15)}$$

Subject to $\tau y = g_u + g_p \qquad \qquad \qquad \qquad \qquad \text{(A16)}$

Forming the Lagrangian function:

$$L = \pi.(\ln c + v\ln g_u) + (1-\pi).\left(\varrho(\pi).g_p\right) + \lambda[\tau y - g_u - g_p] \qquad \text{(A17)}$$

Differentiating with respect to g_u gives:

$$\pi \cdot \frac{v}{g_u} = \lambda \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \text{(A18)}$$

Similarly, differentiating with respect to g_p gives:

$$(1-\pi) \cdot \varrho(\pi) = \lambda \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \text{(A19)}$$

From (A18) and A(19) we obtain:

$$g_u = {\pi \cdot v}\big/{(1-\pi) \cdot \varrho(\pi)} \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad .. \text{(A20)}$$

Which is Equation (15) reported in the main text.
Plugging (A20) into (A16) we obtain:

$$g_p = \tau y - {\pi \cdot v}\big/{(1-\pi) \cdot \varrho(\pi)} \qquad \dots \qquad \dots \qquad \dots \qquad \dots \qquad \dots \text{(A21)}$$

Which is Equation (16) reported in the main text.

Derivations for Proposition 3

Differentiating Equations (19) and (20) reported in the main text yield the following expressions.

$$\partial \theta_u \big/ \partial \pi = {\{v \cdot y (1-\pi)[\varrho(\pi) - \pi \cdot \varrho_\pi] + \pi \cdot v \cdot y \cdot \varrho(\pi)\}}\big/{[y \cdot (1-\pi) \cdot \varrho(\pi)]^2} > 0 \text{ (A22)}$$

$$\partial \theta_p \big/ \partial \pi = {-\{v \cdot y (1-\pi)[\varrho(\pi) - \pi \cdot \varrho_\pi] + \pi \cdot v \cdot y \cdot \varrho(\pi)\}}\big/{[y \cdot (1-\pi) \cdot \varrho(\pi)]^2} < 0 \qquad \dots \text{(A23)}$$

Derivations for Proposition 4:

Taking derivative of Equation (21) with respect to π we have:

$$\partial \gamma \big/ \partial \pi = \psi \cdot \left[(1-\alpha) \cdot \left(\partial \theta_p \big/ \partial \pi \right) - \alpha \left(\partial \theta_p \big/ \partial \pi + \partial \theta_u \big/ \partial \pi \right) \right] \qquad \dots \qquad \dots \text{(A24)}$$

Where

$$\psi = (\theta_p(\pi, \varrho))^{1-\alpha/\alpha} \left(1 - \theta_p(\pi, \varrho) - \theta_u(\pi, \varrho) \right) \cdot (\theta_p(\pi, \varrho))^{-1} > 0 \qquad \dots \text{(A25)}$$

The signs of the derivatives inside the brackets of (A24) are as in (A22) and (A23).

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