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Governance Quality and Economic Growth

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Abstract

Among both academics and the wider development community there seems to be a general acceptance of the value of good governance and its role in promoting economic growth. However, beyond this general statement, there is a lack of deeper theoretical understanding as to why good governance is expected to foster economic growth and how such effects may take place. We define governance quality as the capacity of a government to internalize externality. A theoretical model is developed to formally integrate governance quality into an endogenous growth framework. We elucidate the underlying mechanisms, through which governance quality affects economic performance: governance quality affects the productivity of public investment and in turn has an impact on economic performance. We also highlight that the endogeneity of governance quality and development stages have strong implications for the governance-growth relationship.

Keyword: governance quality, economic growth, endogenous growth model, political institutions

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1 Introduction

While political scientists have a long history of studying the various effects of political power arrangements and the role of government, economists have dedicated increasing attention to the impacts of political institutions and issues of governance quality in the process of social-economic development (for example, North 1990, 1999; Olson, 1996, 2000; Acemoglu et al. 2001, 2004, Persson and Tabellini, 2000, Rodrik et al., 2002, Kaufmann et al. 2007, Seldadyo et al. 2007). The burgeoning literature on the topic has indicated a broad consensus in that economic performance is not always warranted by economic characteristics alone, but it is often shaped by the political and institutional environment in which economic activities take place. It is through the political process in which conflicting interests ultimately are aggregated into public policy decisions. It is then through governance in terms of both making and implementation of public policies that incentives are shaped for economic actors in a society. Therefore, the quality of governance has a fundamental impact on the ultimate economic performance. Summers (2004) summarized that an overwhelming lesson of the 1990s is the transcendent importance of the quality of institutions and the closely related questions of the efficacy of political administration.¹

However, the seemingly well-understood notion of governance is exceedingly ambiguous and inconsistent, and the empirical relationship between governance and economic growth is facing dispute and challenge (Kurtz and Schrank 2007, Andrews 2008, Langbein and Knack 2008). Moreover, beyond the general statement of the critical role of governance quality, many important questions remain unanswered. In the existing literature, little has been said as to *why* governance quality matters and *how* governance quality affects economic development. Notwithstanding a growing body of empirical literature (for example, Knack 2003, Kaufmann et al. 2007), the concept of governance quality is yet to be fully incorporated into any coherent modeling frameworks. To address the lack of theoretical understanding of the governance-growth

¹While we focus on the partial impact of governance on economic growth, we acknowledge the existence of the feedback effect from economic performance to governance quality. In this paper, we see governance quality as an outcome of a given political institutional structure. Any investigation dealing with the feedback effect would necessarily involve an investigation of the co-evolution of political institutions, economic growth and governance quality, which is beyond the scope of this paper.

nexus, this paper focuses on modeling the growth effects of governance quality. We formally incorporate governance quality into an endogenous economic growth model, and demonstrate a potential avenue through which governance quality can affect economic growth.

In Section 2, we start with a brief discussion on the concept of governance and define governance quality in this study. We proceed by offering an overview of the related literature and highlight how our theoretical investigation is related to the existing theoretical and empirical studies. Section 3 describes how we integrate governance quality into an endogenous economic growth model. We propose a theoretical model in which governance quality is predominantly realized through government tax extraction and resources allocation for public goods and service provision. The productivity of a government utilizing tax revenue for productive purposes thus reflects the notion of governance quality. Within an endogenous economic growth framework, we incorporate ideas on government spending and externality to explore the effects of governance quality. We use governance quality as part of an external factor to characterize the process of public capital accumulation. We trace the dynamics of the economy and demonstrate that in steady state, governance quality has a positive impact on long-run economic growth.

In Section 4, we explore the important role of development stages in understanding the governance-growth link by incorporating the political science literature on the underlying institutional determinants of governance quality. Findings from this extension can shed light on the empirical puzzles related to the governance-growth nexus as well as the relationship between political regime and economic growth. We demonstrate that higher average income levels allow for (but do not guarantee) better governance quality, and the optimal arrangement of power in terms of maximizing governance quality varies across different stages of development. Therefore, while higher governance quality leads to better economic performance, the notion of what constitutes good governance and the arrangement of underlying political power to achieve it change in accordance with the evolution of the developmental context. Section 5 provides conclusion remarks and discussion on avenues for future research.

2 Related literature

Governance quality is a complex notion. It can take many forms and there may be trade-offs between different dimensions of governance.² Good governance is often loosely described as effective government, which is a broad and multi-dimensional concept itself. Various widely used governance indicators, e.g. governance index (Kaufmann et al. 1999, 2002, Kaufmann et al. 2003), do not provide an all-encompassing definition. Thomas (2007) describes the various indicators as a result of the mixed “personal ideas of governance” put forward by people developing them. Quibria (2006) points out that governance is often “used as an umbrella concept to federate a whole assortment of different, albeit related, ideas”.

As a core concept in this study, we define governance quality as the capacity of a government to internalize externalities. This definition departs from the those based on description of economic management or particular policy outcomes. We focus on the issues of externalities. Specifically, two types of externalities are fundamental to the role of government. One type is the externalities that primarily originate from private sector and drive a wedge between the individual’s costs and benefits and that of the society. This type of externalities are commonly categorised as market failure. For example, individuals (firms) under-invest in human capital accumulation (R&D), as they do not fully recognize the positive social effects in the process of self- optimization. In this case, good governance quality in terms of internalizing externality is to provide public investment to align the interests of self-seeking individuals/firms with that of the society as a whole. The second type of externalities are the ones stemmed from government behaviour, and hence government failure. In such cases, government can be a major source of negative externality exhibiting its predatory behaviour by enriching itself at great expense to the economy. High governance quality therefore means the control of a government’s discretionary and arbitrary behaviour. Under this definition, we effectively conceptualize governance quality as a joint product of two important features, first, effectiveness in public goods and second, services provision and control of predatory behaviour.

²See Quibria (2006) for a review of the concept of governance and how to measure its quality.

Theoretical work that explicitly links governance quality and economic growth remains sparse. Gradstein (2004) is one of the few studies that present formalized models. However, to the best of our knowledge, the role of governance quality has not been explicitly dealt with in an endogenous economic growth model. To capture the effect of governance quality, we introduce an external factor into the public capital accumulation equation. This external factor consists of governance quality and an average productivity indicator. To describe the degree that government internalizes externalities, the external factor we formulate is akin to the ones used in the models with knowledge spillover (for example, Romer 1986, Tamura 1991). We use governance quality to represent the extent of internalized externalities of the private capital productivity. At the same time, better quality of governance also indicates higher productivity of government in transforming tax revenue into public investment.

Our theoretical framework is most closely related to economic growth models incorporating government spending. In line with literature on government spending, we consider that government extracts tax and allocate tax revenue for public goods provision. Such allocation of resources involves two forms of trade-offs. One is the intertemporal trade-off where consumption and welfare decline in the short run, as resources are attracted toward government spending, but improve over time if productivity is enhanced. The other trade-off is between private capital accumulation and government spending, where taxation diverts resources away from the former towards the latter. In general, government spending provides two types of public goods: public investment and public service. The former primarily refers to spending on productive inputs, which can be accumulated, such as construction of infrastructure, provision of mass education and training. Development of some institutional factors, for example, legal systems, regulatory policies, rules and the enforcement of property rights can also be considered as public investment. In contrast, public service mainly concerns spending on the provision of public services, which are perishable.³

³The distinction between these two types of public goods is probably more conceptual than practical. The different dimensions of governance quality financed by two different types of public expenditure are not necessarily mutually exclusive. For example, expenditure on strengthening the legal system and building other social objectives has obviously two-fold effect. These effects are not only essential to production but also imperfect substitutes to other productive resources.

From a technical perspective, this public investment vs. public service classification corresponds to two different roles of government spending in growth modeling. In the existing literature, Barro (1990) and Futagami et al. (1993) stand for two different treatments of government spending in an economic growth context. Specifically, Barro considers government spending only in the form of public service that cannot be accumulated. Consequently, this type of government spending is a flow variable and the model essentially reduced to a version of the AK model. Key economic variables in Barro's model are consequently all on the balanced growth path, and hence there are no transitional dynamics. In contrast, Futagami et al. develop an endogenous economic growth model with public capital as stock that can be accumulated, and hence their model involves transitional dynamics. To focus on the government spending that is most relevant to governance quality, our model explores how governance quality affects long run economic growth through the evolution of public capital accumulation. With the presence of two stock variables, private and public capital, our model has transitional dynamics. In addition, discussions in Futagami et al. (1993) and Barro (1990) on the optimal size of government are limited to the optimal tax rate. Our model extends to derive the impact of governance quality on the growth-maximizing tax rate.

In its emphasis on the growth effect of governance quality, our study is closely connected to the empirical investigations of governance and economic growth. Literature in this area has proliferated over the past decade, producing a large number of cross-countries studies (for example, Mosca, 2007) and country-specific case studies.⁴ However, there remains a lack of consensus on fundamental questions such as “what is the role of governance?” and “what constitutes an effective government?” Part of the reason behind the overall inclusiveness of the literature is related to the identification difficulties involved in empirical analysis. Glaeser et al. (2004), among others, have stressed the fragility and sensitivity of many empirical findings due to unsuitable indicators of institutions used and the estimation technique employed.

More importantly, the mixed empirical findings reflect the lack of an effective theoretical

⁴For example, see studies on US (Matheson et al. 2007), on UK, Denmark and other OECD countries (Rexed et al. 2007) and Australia and New Zealand (Halligan, 2007).

framework to guide the use of various institutional and governance quality indicators (Andrews, 2008). A methodological concern arises when a large number of institutional and governance variables are assembled under the vague labels of institution and governance. Without differentiating the vastly different nature and implications of these variables, an indicator of the configuration of political institutions (e.g. political regime) is analyzed typically the same way as a variable that demonstrates the capacity of a government to produce and implement good policies (e.g. quality of regulatory policies and government effectiveness). Consequently, when probing the impact of governance quality, endogenous variables are often treated as given and the economics literature remains largely agnostic on its underlying determinants. Andrews (2008) reviews existing studies using various governance indicators, and concludes that the picture emerged from the “good governance agenda” is of limited use for developing countries and could be misleading in shedding light on improving governance quality. Andrews identifies the major problems with various governance indicators is the lack of an effective underlying theoretical framework, which allows for an investigation into the roles of government in different developmental contexts. Clearly, a major gap exists between the proliferating yet controversial statistical evidence of the importance of governance on the one hand, and the lack of theoretical analysis of its role on the other.

3 An endogenous economic growth model with governance quality

In the spirit of Barro (1990) and Futagami et al. (1993), the model described here considers public capital as a productive input factor, which directly enters the production function. Furthermore, it is assumed that the government imposes taxes and uses revenues to finance public expenditure that directly affects the decisions of private agents in the economy. This setting leads to an optimization process of government fiscal policy. Governance quality is thus formally introduced into the context of economic growth.

- Production technology

Consider an economy consisting of a continuum of representative individuals or household agents, where each representative agent has an infinite planning horizon and possesses perfect insight. Each agent is endowed with a unit of labor L_t , and produces output Y_t at time t , using the following Cobb-Douglas production technology

$$Y_t = AL_t^{1-\alpha} K_t^\alpha G_t^{1-\alpha} \quad 0 < \alpha < 1, A > 0 \quad (1)$$

where A is a total factor productivity (TFP) parameter, K_t denotes the agent's stock of private capital. G_t denotes government investment as stock of government capital, such as transportation network, other infrastructure and additional institutional factors that affect private productivity. Moreover, G_t is assumed to be non-rival and available to producers at the same time. As a result, the production function exhibits constant returns to scale in two private factors—labour L_t and capital K_t , and increasing returns to scale when public capital G_t is included. The restrictions on parameters α and A ensure output has positive, but diminishing, marginal physical product in all three factors. In per capita terms, this technology can be written as

$$y_t = Ak_t^\alpha G_t^{1-\alpha} \quad (2)$$

Eq(2) is similar to the production technology in Futagami et al. (1993), in which public capital is also considered as a stock variable. The accumulation of private capital is governed by

$$\dot{k}_t = (1 - \tau)y_t - c_t - \delta_K k_t \quad (3)$$

which indicates that the rate of private capital accumulation in the economy is the excess of current production over private consumption and taxes that contribute to public expenditures less depreciation. We assume that the government sets its tax revenue as a fixed fraction τ of output. Technically, this functional form allows τ to be set arbitrarily. In a normative case, τ can be chosen optimally to maximise certain objectives, such as growth rates and social welfare,

taking into account an assumption about the degree of government benevolence.

In contrast to private capital accumulation, public capital accumulation, \dot{G}_t , is a joint product of both the tax revenue and an externality factor the government, $f(\tilde{y}_t)$, less depreciation.

$$\dot{G}_t = \tau y_t f(\tilde{y}_t) - \delta_G G_t \quad (4a)$$

Specifically, the externality factor is

$$f(\tilde{y}_t) = \left(\frac{Y_t}{K_t}\right)^\pi \quad (\pi > 0) \quad (4b)$$

where $\tilde{y}_t = \frac{Y_t}{K_t}$, which is the average output-capital ratio, and $f(\tilde{y}_t)$ represents the external effects of private economic activities on the society as a whole, such as social benefits or costs due to change in private economic actions. π denotes governance quality, reflecting the capacity of government regulations and policies including tax policies to “correct” externalities so as to maximise the interests of the society. Correspondingly, in this model, the degree to which externalities are internalised, or in other words, the behaviour of $f(\tilde{y}_t)$, largely depends on π . Intuitively, Eq(4b) also indicates that given the same average output-capital ratio, the higher the governance quality the greater such externality is internalised into public capital accumulation. Therefore, $f(\tilde{y}_t) = \left(\frac{Y_t}{K_t}\right)^\pi$ captures the internalised externality on the society.

Technically, $f(\tilde{y}_t)$ can also be interpreted as a productivity factor for transforming government tax revenue into public capital. Instead of including externalities as a component of production function, such as the “learning-by-doing” type of models of Arrow (1962) and Romer (1986), this model incorporates the impact of externalities in the function which governs the evolution of public capital. This is not only consistent with the idea that externalities have an important impact on the aggregate goods production, but also highlights the implications of governance quality for public capital and in turn the aggregate economy. δ_K and δ_G in Eq(3) and Eq(4a) are depreciation rates of private capital and public capital, respectively. For simplicity, they are both assumed to be zero. Substitute Eq(4b) into Eq(4a), the accumulation of

public capital takes the form

$$\dot{G}_t = \tau y_t \left(\frac{Y_t}{K_t} \right)^\pi - \delta_G G_t \quad (4c)$$

- Preference

The utility function of a representative agent is as follows:

$$U \equiv \int_0^\infty \frac{(c_t)^\gamma - 1}{\gamma} e^{-\rho t} \quad \text{for } \gamma < 1, \text{ and } \gamma \neq 0 \quad (5)$$

$$\equiv \ln c_t \quad \text{for } \gamma = 0$$

where c_t denotes the consumption of an individual agent at time t and ρ is the rate of time preference. Following Mulligan and Sala-i-Martin (1993), ρ can be interpreted as the difference between the pure rate of time preference (ρ^*) and the exogenous rate of population growth (n), i.e. $\rho = \rho^* - n$. The exponent relates to the intertemporal elasticity of substitution, which equals the inverse of $(1 - \gamma)$.

- Solving the model

Formally, an agent's objective is to choose a consumption level so as to maximise the above utility function Eq(5), subject to the capital accumulation, Eq(3). The derivation in Appendix provides an explicit expression of the balanced growth path.

$$g = \frac{\alpha}{1 - \gamma} (1 - \tau) \left(\frac{g}{A\tau} \right)^{\frac{1-\alpha}{(1-\alpha)\pi - \alpha}} - \rho \quad (6)$$

For simplicity, let L_t , the total amount of labour employed in the production be normalised to 1. With this assumption, $L_t = 1$ for all t , all quantities in aggregate terms have the same forms as those in per capita terms. The current value Hamiltonian is defined as

$$\tilde{H} \equiv \frac{(c_t)^\gamma}{\gamma} + \lambda_t [(1 - \tau) y_t - c_t] \quad (7)$$

where λ_t is the co-state variable related to private capital . The first order conditions are as follows

$$C_t^{\gamma-1} = \lambda_t \quad (8)$$

$$\frac{\dot{\lambda}_t}{\lambda_t} = \rho - \alpha(1 - \tau)\left(\frac{G_t}{k_t}\right)^{1-\alpha} \quad (9)$$

Eq(8) shows that the marginal contribution of consumption to the current flow of value equals the product of the value of stock at time t and the marginal effect of consumption on the rate of growth of capital at that time. Eq(9) represents that the rate of change in the value of wealth equals the marginal impact of level of capital on its own rate of growth with respect to time preference. These first order conditions together with the following transversality condition

$$\lim_{t \rightarrow \infty} \lambda_t k_t e^{-\rho t} = 0 \quad (10)$$

lead to the optimisation result

$$\frac{\dot{c}}{c} = \frac{1}{1 - \gamma} \left[\alpha(1 - \tau)\left(\frac{G_t}{k_t}\right)^{1-\alpha} - \rho \right] \quad (11)$$

Substitute $Y_t = AK_t^\alpha G_t^{1-\alpha}$ into Eq (4c) and the evolution of public capital accumulation is as follows:

$$\dot{G}_t = A\tau K_t^\alpha G_t^{1-\alpha} \left(\frac{Y_t}{K_t}\right)^\pi \quad (12)$$

Assume there exists an equilibrium where consumption (c_t), private capital (k_t), public capital (G_t) and national product (y_t) are growing at the same pace, g , i.e. on the balanced growth path. Eq(12) can be expressed as

$$g = \frac{\dot{G}_t}{G_t} = A\tau \left(\frac{G_t}{K_t}\right)^{(1-\alpha)\pi - \alpha} \quad (13)$$

and therefore

$$\frac{G_t}{K_t} = \left(\frac{g}{A\tau}\right)^{\frac{1}{(1-\alpha)\pi-\alpha}} \quad (14)$$

Substitute Eq(14) into Eq(13), the equilibrium growth rate along the balanced growth path is

$$g = \frac{\alpha}{1-\gamma}(1-\tau)\left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} - \rho \quad (15)$$

Since the derivation of the equilibrium is based on the assumption of its existence, the next task is to prove such existence.

- **Proposition 1** There exists a unique balanced growth path, where c_t , k_t , G_t and Y_t have the same growth rate of g .⁵
- **Proposition 2** For any given initial value of $Z = \frac{G}{K}$, there exist a unique stable path leading to the balanced growth path.⁶
- **Proposition 3** Governance quality has a positive impact on the long run growth rate.

To see the impact of governance quality on the long-run economic growth rate, we apply Chain Rule and total differentiate Eq(6) with respect to π

$$\frac{dg}{d\pi} = \frac{\alpha(1-\tau)}{1-\gamma}\left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} \left\{ \frac{d\frac{1-\alpha}{(1-\alpha)\pi-\alpha} \ln\left(\frac{g}{A\tau}\right)}{d\pi} \right\} \quad (16a)$$

This means the sign of $\frac{dg}{d\pi}$ depends on that of $\ln\left(\frac{g}{A\tau}\right)$: if $\ln\left(\frac{g}{A\tau}\right)$ is greater (less than) 0, $\frac{dg}{d\pi}$ is less (greater) than 0. To see the sign of $\ln\left(\frac{g}{A\tau}\right)$, rearrange Eq(6) and we obtain

$$(g + \rho) \frac{1-\gamma}{\alpha(1-\tau)} = \left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} \implies \left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} > \frac{g(1-\gamma)}{\alpha(1-\tau)} \quad (17a)$$

⁵Proof of Proposition 1 is included in Appendix.

⁶Derivations to prove Proposition 2 is included in Appendix.

Take logarithm of both sides

$$\frac{1-\alpha}{(1-\alpha)\pi-\alpha} \ln\left(\frac{g}{A\tau}\right) > \ln \frac{(1-\gamma)}{\alpha(1-\tau)} + \ln g \quad (17b)$$

Recall that $\frac{1}{1-\gamma}$ is the intertemporal elasticity of substitution, which is typically < 1 implying $\gamma < 0$, and hence $\frac{1-\gamma}{\alpha(1-\tau)} > 1$. Therefore, the LHS of Eq(17b) is greater than zero and the sign of $\ln\left(\frac{g}{A\tau}\right)$ depends on that of $\frac{1-\alpha}{(1-\alpha)\pi-\alpha}$. α and $(1-\alpha)$ are the shares of private capital and public capital on the equilibrium growth path as well as the elasticities of private and public capital with respect to the national product. Therefore, $\frac{\alpha}{1-\alpha}$ is the elasticity of substitution of public capital with respect to private capital. Recall that π is governance quality indicating the capacity of a government to internalise externalities. This implies that when the externalities are entirely internalised, the theoretically best achievable governance quality in this model equals to $\frac{\alpha}{1-\alpha}$, and hence $\pi < \frac{\alpha}{1-\alpha}$. Consequently, $\frac{1-\alpha}{(1-\alpha)\pi-\alpha} < 0$, and therefore $\ln \frac{g}{A\tau} < 0$. As a result, $\frac{dg}{d\pi} > 0$, indicating that the higher the quality of governance, the higher the long-run economic growth rate.

- Impact of governance quality on the size of government

In addition, our model allows us to explore the effects of governance quality on optimal tax rate (or sometimes referred to as optimal size of government). There has been extensive literature on the optimal government size, which is often approximated by the value of government spending financed by tax revenue. The question of the optimal size of government thus often becomes a question of optimal tax rate. Our model provides a linkage, which connects the idea of governance quality and the optimal size of a government. We first establish the existence of an optimal tax rate.

- **Proposition 4** There exists a unique optimal tax rate τ^* which maximises the long-run growth rate, and governance quality has a positive impact on the optimal tax rate.

– Proof: Total differentiate Eq(6) with respect to τ

$$\frac{dg}{d\tau} = \frac{\frac{\alpha}{1-\gamma} \left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} \left[-1 - \frac{1-\tau}{\tau} \frac{(1-\alpha)}{(1-\alpha)\pi-\alpha}\right]}{1 + \frac{\alpha(1-\tau)}{1-\gamma} \left(\frac{g}{A\tau}\right)^{\frac{1-\alpha}{(1-\alpha)\pi-\alpha}} \frac{\alpha-1}{(1-\alpha)\pi-\alpha} \frac{1}{g}} \quad (18)$$

The sign of Eq(18) hinges on whether π is greater or less than $\frac{\alpha}{1-\alpha}$. Because $\pi < \frac{\alpha}{1-\alpha}$, the denominator is unambiguously positive and leads to the following results:

$$\begin{aligned} \text{If } \tau > \tau^* \quad \frac{dg}{d\tau} &< 0 \\ \text{If } \tau = \tau^* \quad \frac{dg}{d\tau} &= 0 \quad \text{where } \tau^* = \frac{1-\alpha}{1-\pi(1-\alpha)} \\ \text{If } \tau < \tau^* \quad \frac{dg}{d\tau} &> 0 \end{aligned} \quad (19)$$

It is clear from these results that there exists an optimal tax rate τ^* which maximises the balanced growth rate. Also because $\pi < \frac{\alpha}{1-\alpha}$, it follows that τ^* is within the feasible range between 0 and 1.

$$\tau^* = \frac{1-\alpha}{1-\pi(1-\alpha)} \quad (20)$$

From Eq(20), it is straightforward to see that π and τ^* are positively correlated. Intuitively, it indicates the better the quality of governance the higher the optimal tax rate of a government in terms of maximising the long-run growth rates.

3.1 Impact of development stages on the optimal political institutional structure

Reviewing the recent trends in economics literature, Deaton (2010) identifies the major limitations of empirical studies that show how certain developmental projects can lead to a particular set of observable results without, however, explaining how and why such projects can work. Deaton therefore calls a much-needed refocus toward the investigation of potentially generalizable mechanisms and in what context. The endogenous growth model presented in the previous section elucidates the mechanism through which the governance-growth link operates. In this section, we address the important issue of the developmental context in which the growth effects

of governance quality take place. A particular level of development is associated with a host of social-economic characteristics that are of great importance for growth, for example, provision of infrastructure, the average level of mass education as well as the enforcement of the rule of law. These factors, together with historical, cultural and additional institutional factors define a society's prevailing conditions. A government will need to build upon these conditions, allow a suitable time frame for these conditions to evolve and deal with issues that arise from these conditions. In this study, we use development stages as a (imperfect) proxy to characterize the context in which the link between governance and growth exists.

We first provide the political institutional background to the endogenous economic model by drawing on the established political science literature on the underlying political institutional factors that shape governance quality. Consistent with Acemoglu et al. (2004) and many others, political institutions are considered to define the constraints and the incentives of the key actors in the political sphere.⁷ Political institutional structure, referring to the distribution of political power, determines the capacity and opportunity of the government to exercise discretion over the rules that organize social life, and consequently determines the quality of governance.⁸ Furthermore, how political decision-making powers are structured has a significant impact on the way it is exercised by the government. Different types of organizational architecture may entail respective incentive problems inherent to it and thus unique governance problems (Aoki, 2001). The vast political science literature has generally suggested two, albeit somewhat contradictory, understandings in terms of how political institutional configurations affects governance quality.⁹

⁷The literature on political institutions and governance is vast. Without intention to provide a comprehensive review, we primarily draw on the discussion in, among other, Laffont and Tirole (1991), Kydland and Prescott, (1997), Persson et al. (1997, 2003), Mulligan et al. (2004).

⁸To overcome the deficiency of a democracy vs. authoritarian categorization, we make a deliberate departure from this dichotomy and focus on the overall organizational structure of political powers. We replace a binary approach of political regimes with a broader and continuous spectrum of the configurations of aggregate decision-making powers, and thereby accommodate a wide variety of political institutional arrangements.

⁹In the established political economy literature, power fragmentation typically involves various forms of classification: centralization vs. decentralization; functional division of power vs. sequential division of power, etc (e.g. Brennan and Hamlin, 1994). Moreover, in many previous studies, the term "separation of power" often refers to Locke and Montesquieu's concept of the need for the division of legislative, executive, and judicial branches of government in democracies. We primarily focus on the horizontal separation of power at the aggregate level rather than vertical decentralization that disperses state responsibilities to regional branch offices (see for example, Oates 1972, Gordon, 1983, Sinn 1990). Consistent with our definition of political institutional configuration, we adopt a more generalized approach, which does not apply restrictively to modern western style democracies. We thus accommodate a wide variety of political institutional arrangements by replacing a binary approach of

One line of political science theory emphasizes the risk of capricious and arbitrary behaviour from excessively concentrated power, and hence advocates for more dispersed structures of political institutions in the interests of credibility and stability. Elster (1994:215) categorically asserts that in order to be effective, power must be divided. In contrast, this view is challenged by arguments that highlight the indecisiveness, higher probability of inertia and delays in response associated with fragmented power-sharing structures. This school of thought often draws upon the experiences of fast growing East Asian economies with distinctively strong state. Studies, such as Alesina and Drazen (1991), Alesina et al. (1998), Woo-Cummings (1999), and Keefer (2004), stress the desirability of more concentrated political institutional structures and the virtue of decisiveness and autonomy in the process of government policy-making and implementation.¹⁰

These two schools of thought in political science highlight the trade-off and complementarity between effectiveness and credibility as two essential features of governance quality. In the same vein, Olson (2000) identifies the type of governments needed for growth: on the one hand, secure and well defined of private property and impartial enforcement of contracts and, on the other hand, the absence of predation. This conceptualization of governance quality is in line with the definition used in our study. Good governance quality means a joint product of being capable of correcting market failure and limiting government failure at the same time, i.e. to internalize externalities created by both the private and public sectors. Furthermore, to built upon the literature on the association between governance quality and its underlying power-sharing structure, we consider governance quality as a product of political institutional structure. MacIntyre (2003) reconciles these two conflicting paradigms by suggesting a non-monotonic relationship between the power concentration structure and the resulted impact on governance quality.¹¹ Namely, neither overly fragmented nor excessively concentrated power-sharing structure will lead to good governance.¹² This conclusion motivates us to extend our political regimes with a broader and continuous spectrum of the configurations of aggregate decision-making powers.

¹⁰Related studies also include, for example, Wade (1990), Weingast (1995), McCubbins (1989).

¹¹MacIntyre (2003) uses “non-linear” to characterize this trade-off effect of political institutional structure on governance quality. To be more precise, we term it a “non-monotonic” relationship.

¹²To understand the effects of the configuration of political institutions on governance quality, we can consider

vestigation on the governance-growth link and incorporate the underlying political institutional structures. We can postulate that the relationship between political institutional structure and economic growth outcome is likely to be non-monotonic. Governance quality can now serve as a channel, through which political institutional structures affect economic growth. Governance quality and long-run economic growth can be better achieved when the political power is shared in a balanced structure and not overly concentrated or excessively fragmented.¹³

How do levels of development affect this relationship? A higher level of development is typically associated with not only more material wealth and higher productivity, but also a more educated population, better infrastructure and more effective means for monitoring and revealing rent-seeking behaviour, such as media and press. Therefore, as countries move up on the development ladder, whilst holding political institutional structure constant, they are likely to be more effective in controlling discretionary behaviour, and are more capable of providing public goods and services. Consequently, *ceteris paribus*, the level of development positively affects the resulting governance quality. With the aid of a more educated population, the additional cost of rigidity (due to the fragmentation of power arrangements) is diminishing at the same time as an economy is improving its developmental stage. Therefore, the governance-maximizing political institutional configuration becomes more dispersed as a country becomes more developed. The extension of the original model thus accommodates the idea that an optimal structure of political institutions depends at least partially on the specific stage of development.¹⁴

the costs associated with the two aspects of governance quality, i.e. providing public goods and engaging in rent extraction. Specifically, we can characterize the unit cost of public goods or services provision as the sum of the unit cost of private consumption goods production as a benchmark in addition to an inefficiency factor. The inefficiency factor captures the negative effect resulted from fragmentation of political power. Fragmentation of power increases the cost for and reduces productivity of a government to convert tax revenue into public goods and services provision. At the same time, we can capture the cost of rent-seeking behavior as an increasing function of power fragmentation. As political institutional structure becomes more dispersed, self-enriching behaviour tends to be more difficult due to increase in checks and balances.

¹³Rivera-Batiz (2002) is one of the few attempts in the economics literature that integrate institutions, particularly political institutions into the formal economic growth model. Rivera-Batiz's work provides a theoretical underpinning for empirical result that demonstrates democratic countries have significantly higher quality of governance. These results emphasize the point that contribution to growth only occurs insofar as democracy improves governance quality.

¹⁴The assertion that the optimal configuration of political power is less dispersed for poorer countries than for rich countries, however, does not lead to the assertion that checks and balances are not important or less desirable in poor countries. On the contrary, maintaining credibility tends to be economically important in

4 Conclusion

The conventional neoclassical wisdom is that economic growth is largely determined by the accumulation of physical capital, human capital, and knowledge usable in production. These factors are considered as proximate determinants of economic growth, which characterize the immediate connection between the productive factors and economic outcome. For many, today, economics is understood as an interplay of incentives, largely because the changes in productive factors are primarily driven by decisions of economic agents. These decisions are in turn shaped by incentives: incentives to work hard, to produce good quality products, to study, to invest, to save, etc. (Laffont and Martimort 2002). Therefore, incentives are deeper determinants underlying the immediate productive factors. It is the changes in incentives that in turn affect human behaviour. One important aspect to understand the underlying incentives of an economy is its governance quality. The governance-growth link has been explored empirically for over a decade. However, in the absence of a coherent theoretical model, the impact of governance on growth remains a matter of controversy.

Pawson and Tilley (1997) articulate that it is the combination of mechanism and context that generates outcomes and that, without understanding this combination, scientific progress is unlikely (cited in Deaton 2010). In this paper, we define the concept of governance quality as the capacity of government to internalize externalities originated from both private and public sectors. We integrate governance quality into an endogenous economic growth model and demonstrate that governance quality affects economic growth through the channel of the public capital accumulation. The higher the quality of governance is, the more productive a government will be in transforming tax revenue into public goods and services. We also show that the optimal size of government, as measured by tax rate, is a function of governance quality: the better quality a government, the greater the optimal tax rate.

developing countries (World Bank, 2002). What the preceding conclusions highlight is that the trade-off between effectiveness in public goods provision and control of rent-seeking behaviour may have different implications for countries at different stages of development. More generally, this provides a theoretical explanation for the notion that there is no one-size-fits-all organizational template, which can be indiscriminately applied across board to warrant best governance quality.

Against the backdrop of complex intertwining of politics and economics, we draw on the existing political science literature to capture the relationship between the characteristics of authority and the general patterns of governance. The non-trivial choice of political institutional structure embodies the trade-off facing a government between addressing market failure and controlling government failure. Concentrated power tends to entail arbitrary and discretionary behavior, and translates into higher likelihood of rent extracted by the government, while fragmented power-sharing structures often encourage budget deficits, delay in policy responses and higher cost of public goods and service provision. By integrating the non-monotonic relationship between political institutional structure and governance quality into the governance-growth nexus, we suggest that governance quality can serve as a channel through which political institutions affect economic performance. Our results on the varying optimal configuration of political powers can also shed light on the ongoing debate concerning the economic growth effects of political institutions. Without looking through the lens of developmental context, the views in the existing literature are diverging and the overall evidences are inconclusive as to whether a particular regime type improves or hinders long-run economic performance. In contrast, we underscore that economic performance depends on the compatibility of a country's political institutions and its idiosyncratic characteristics and prevailing conditions. The degree to which political institutional structures have reached their optimum depends on the context of economies at particular stages of development.

By extending the governance-growth into the political institutional context, we can better understand the role of governance quality in the process of economic growth. Examining the effects of developmental levels allows us to uncover an important issue that potentially explained the mixed empirical results on governance-growth link as well as the more controversial relationship between political regime and growth.¹⁵ Our analysis suggests that *ceteris paribus*, the political institutional structure that maximizes governance quality (and hence growth) varies

¹⁵There is a vast body of literature on the relationship between political regims and economic performance. A comprehensive review of the relevant literature is beyond the scope of the present study. For theories and political economy models, see for example Buchanan (1975), Persson and Tabellini (2000). For empirical investigations, see for Prezeworki and Limongi's (1993) earlier review of 18 studies and Benaubou (1996), Brunetti (1997) reporting diverging and ambiguous results of emprical investigation. More recent studies include Henisz (2000a, 2000b), Cox and McCubbins (2001) and Feng (2003).

across developmental contexts. This finding can help resolve some empirical puzzles, such as the role of government in East Asia. Stiglitz (2002) observes “In East Asia, the part of the world that has had the most successful development, governments took an unabashedly central role. . . the success of East Asia provided dramatic evidence of the superiority of an economy in which government takes an active role to the self-regulating market.” Our analysis implies that economies at lower development levels, *ceteris paribus*, can maximize governance quality (and hence growth) with a configuration of political institutions that is relatively concentrated so long as it is compatible with the economy’s developmental context. Furthermore, the notion that optimal political institutional structures need to be attuned with levels of development gives rise to implications on sustainability of economic growth and the advocacy of a particular “institutional blend”. A key determinant of the sustainability of growth will be as to whether the political institutional structure can evolve in ways that will meet the demands of changing economic conditions.

Inferences of the optimal endogenous optimal structure of political power can be applied to a single country’s transitional experience, moving from a lower to a higher rung on the development ladder, as well as within a cross-countries context. Whilst many underdeveloped countries appear to have concentrated political institutional configurations, the concept of centralized power seems to have lost much popularity within the development community. The idea of division of power promises a wide range of benefits. Consequently, fragmenting political decision-making power and introducing checks and balances are often suggested as means to improve government credibility and effectiveness and economic performance. Our study casts doubts on such a claim. Institutions that have delivered growth in some countries do not necessarily engender a favorable economic outcome under different circumstances. Countries need to consider their specific development stages before emulating the political institutional configuration of other countries. By demonstrating the critical role of development stages, we provide a theoretical explanation as to why there are no one-size-fits-all policies that are applicable to all economies. Policies that are associated with favorable economic performance in one country do not necessarily lead to similar outcome when applied in another country.

A Proof for Proposition 1 and 2

- **Proposition 1:** There exists a unique balanced growth path, where c_t , k_t , G_t and Y_t have the same growth rate of g .

– Proof 1: First, Eq(6) can be rewritten as

$$g + \rho = \frac{\alpha}{1 - \gamma} (1 - \tau) \left(\frac{g}{A\tau} \right)^{\frac{1-\alpha}{(1-\alpha)\pi - \alpha}} \quad (\text{A1})$$

Denote the RHS of Eq(A1) by $\Gamma(g)$ and it leads to

$$\Gamma'(g) = \frac{\alpha}{1 - \gamma} \frac{(1 - \tau)}{A\tau} \frac{(1 - \alpha)}{(1 - \alpha)\pi - \alpha} \left(\frac{g}{A\tau} \right)^{\frac{1-(1-\alpha)\pi}{(1-\alpha)\pi - \alpha}} \quad (\text{A2})$$

The sign of $\Gamma'(g)$ depends on the value of $(1 - \alpha)\pi - \alpha$. If $\Gamma''(g) > 0$, $\Gamma(g)$ is a convex function with the following properties

$$\begin{aligned} \Gamma'(g) &< 0 \text{ if } \pi < \frac{\alpha}{1-\alpha} \\ \Gamma'(g) &> 0 \text{ if } \pi > \frac{\alpha}{1-\alpha} \end{aligned} \quad (\text{A3})$$

As shown in the derivation of g , that $\pi < \frac{\alpha}{1-\alpha}$, therefore

$$\begin{aligned} \lim_{g \rightarrow 0} \Gamma &= +\infty, \quad \lim_{g \rightarrow 0} \Gamma' = -\infty \\ \lim_{g \rightarrow +\infty} \Gamma &= 0, \quad \lim_{g \rightarrow +\infty} \Gamma' = 0 \end{aligned} \quad (\text{A4})$$

The LHS of Eq(A1) will intersect and only intersect with $\Gamma(g)$ once, and that guarantees a unique positive balanced growth rate in the equilibrium.

- – Proof 2: Alternatively, summarising Eq(4a), Eq(5) and Eq(10), the following dynamic equations can be obtained:

$$\frac{\dot{X}}{X} = \frac{\dot{c}}{c} = \frac{\dot{k}}{k} = \frac{(\alpha + \gamma - 1)(1 - \tau)}{(1 - \gamma)} Z^{1-\alpha} - \frac{\rho}{(1 - \gamma)} + X \quad (\text{A5a})$$

$$\frac{\dot{Z}}{Z} = \frac{\dot{G}}{G} = \frac{\dot{k}}{k} = A\tau Z^{(1-\alpha)\pi-\alpha} - (1-\tau)Z^{1-\alpha} + X \quad (\text{A5b})$$

where $X \equiv \frac{c}{k}$, and $Z \equiv \frac{G}{K}$.

These equations describe the dynamics of the economy. To characterise the steady-state of the model and demonstrate the existence and uniqueness of the equilibrium, the following equations show there exists a unique stationary state which satisfies $\dot{X} = \dot{Z} = 0$. The stationary state is defined by

$$X^* = \frac{(1-\alpha-\gamma)(1-\tau)}{(1-\gamma)} Z^{*1-\alpha} + \frac{\rho}{(1-\gamma)} \quad (\text{A6a})$$

$$X^* = (1-\tau)Z^{*1-\alpha} - A\tau Z^{*(1-\alpha)\pi-\alpha} \quad (\text{A6b})$$

where variables with asterisks represent the steady-state value of the variables. On the *balanced growth path*, private capital, public capital, consumption and national product are all growing at the same rate, denoted by g .

Subtract Eq(A6b) from Eq(A6a),

$$\Lambda(Z^*) = A\tau Z^{(1-\alpha)\pi-\alpha} - \frac{\alpha(1-\tau)}{(1-\gamma)} Z^{1-\alpha} + \frac{\rho}{(1-\gamma)} \quad (\text{A7})$$

In steady-state, $\Lambda(Z^*) = 0$. Differentiate $\Lambda(Z^*)$ with respect to Z^* ,

$$\Lambda'(Z^*) = [(1-\alpha)\pi - \alpha]A\tau Z^{(1-\alpha)\pi-\alpha-1} - \frac{\alpha(1-\tau)}{(1-\gamma)} Z^{-\alpha} < 0 \quad (\text{A8})$$

Eq(A8) is less than zero because the sign of the first item depends on the value of $(1-\alpha)\pi - \alpha$, and given the reasons mentioned above, i.e. $\pi < \frac{\alpha}{1-\alpha}$, and therefore $(1-\alpha)\pi - \alpha < 0$.

The second order derivative of $\Lambda(Z^*)$ with respect to Z^* equals to

$$\Lambda''(Z^*) = [(1-\alpha)\pi - \alpha][(1-\alpha)\pi - \alpha - 1]A\tau Z^{(1-\alpha)\pi - \alpha - 2} + \frac{\alpha^2(1-\tau)(1-\alpha)}{(1-\gamma)}Z^{-\alpha-1} > 0 \quad (\text{A9})$$

Therefore, $\Lambda(Z^*)$ is a convex function that monotonically decreases. When Z^* is small enough, $\Lambda(Z^*) > 0$ and $\Lambda(Z^*) < 0$, when Z^* is sufficiently large. As a result, there is a unique positive value of Z^* which satisfies $\Lambda(Z^*) = 0$. It implies that if X^* is positive, there exists a unique balanced growth path. Eq(A6b) implies Z^* has to be less than $(\frac{1-\tau}{A\tau})^{\frac{1}{(1-\alpha)\pi-1}}$ for X^* to be positive. Rewrite Eq(A6a) as $X^* = (1-\tau)(\frac{G}{K})^{*1-\alpha} - (\frac{\dot{C}}{C})^*$ and it indicates that in order to have $X^* > 0$, $(\frac{\dot{C}}{C})^*$ has to be relatively small. As Eq(10) indicates that $(\frac{\dot{C}}{C})^*$ is only a fraction of $(1-\tau)(\frac{G}{K})^{*1-\alpha}$, it once again proves there exists a unique balanced growth path.

Given the existence of the equilibrium, the next task is to examine the stability of the equilibrium of balanced growth, and this requires investigation of the transitional dynamics.

- **Proposition 2:** For any given initial value of $Z = \frac{G}{K}$, there exist a unique stable path leading to the balanced growth path.

– Proof: First, rewrite Eq(A5a) and Eq(A5b)

$$\dot{X} = \left[\frac{(\alpha + \gamma - 1)(1 - \tau)}{(1 - \gamma)} Z^{1-\alpha} - \frac{\rho}{(1 - \gamma)} \right] X \quad (\text{A10a})$$

$$\dot{Z} = [A\tau Z^{(1-\alpha)\pi - \alpha} - (1 - \tau)Z^{1-\alpha} + X]Z \quad (\text{A10b})$$

Linearize Eq(A10a) and Eq(A10b) around the steady-state equilibrium

$$\begin{bmatrix} \dot{X} \\ \dot{Z} \end{bmatrix} = \begin{bmatrix} X^* & \frac{(\alpha + \gamma - 1)(1 - \tau)}{(1 - \gamma)} X Z^{-\alpha} \\ Z^* & \left\{ (1 - \alpha) [(1 - \alpha)\pi] A\tau Z^{(1-\alpha)\pi - \alpha - 1} - (1 - \tau)Z^{-\alpha} \right\} \end{bmatrix} \quad (\text{A11})$$

The determinant of this coefficient matrix J equals to

$$\det J = XZ^{1-\alpha} \left\{ (1-\alpha) [(1-\alpha)\pi - \alpha] A\tau Z^{(1-\alpha)-1} - \frac{\alpha}{1-\gamma} (1-\alpha)(1-\tau) \right\} \quad (\text{A12})$$

Because the determinant of coefficient matrix J is less than zero, it means that one of the eigenvalues of this coefficient matrix is positive and the other is negative. Therefore, the balanced growth path or equilibrium at the steady-state is a saddle point, which essentially means for any given initial value of $Z = \frac{G}{K}$, there exists a unique stable path converging to the balanced growth equilibrium. This result is consistent with Proposition 2 in Futagami et al. (1993) where they found the steady-growth equilibrium is stable.

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