

# How to make a dis-entrepreneur of the Schumpeterian entrepreneur: the impact of institutional settings on growth

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**Abstract** Fiscal and monetary institutions are conspicuously omitted in the conventional theory of long-run economic growth. Moving from the Schumpeterian entrepreneur, who adopts new technology because its value, according to Tobin's  $q$ , dominates the economic rents of existing capital, we argue that the Schumpeterian entrepreneur's incentives to innovate change when he is transplanted into the public economy. We analyze two alternative institutional settings denoted as "long chain" and "short chain". Through the "long chain" model we show that the Schumpeterian entrepreneur is driven towards "destructive creation" of new capital, thus becoming a political dis-entrepreneur, while the quasi-contractual "short chain" model provides incentives to innovate.

**Keywords** Creative destruction · Economic growth · Institutions · Tobin's  $q$

## 1 Introduction

Studying economic growth, *in vitro*, does not enable us to understand the impact that public economic institutions may have on market institutions. To this end, we attempt to extend an endogenous growth model of the Schumpeterian entrepreneur to the politico-bureaucratic domain. In doing so, we wish to show that institutions are not neutral *vis à vis* economic

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growth.<sup>1</sup> Studies that focus on the relationship between institutions and economies go back to the 1970s and even earlier. For example, Buchanan (1975) introduced the concept of constitutional political economy. Coase (1960) discovered and vitalized the concept of transaction costs, North and Thomas (1973) and North (1990, 1994, 1997) contributed to the understanding of institutions by reference to different places and epochs. Selected aspects of institutional arrangements and specialization had appeal also to Eggertsson (1990), who engaged in theoretical analysis on neoinstitutional economics. Rodrik et al. (2004) show that measures of the quality of institutions empirically dominate the effects of geography and economic integration in determining income levels. Acemoglu et al. (2001) and others show the importance of institutions in the different experiences of the economic development of nations.

However, Rodrik (2004) argues that institutional quality remains a nebulous concept and “...that effective institutional outcomes do not map into unique institutional designs”. This lack of identification and the consequent ambiguity of the causation between the quality of institutions affecting, and being affected by, incomes and development are still problematic (*vide* Acemoglu and Johnson 2005).

Given our interest in fiscal institutions and economic growth, a related difficulty is the treatment of the fiscal constraint in explicit models of growth. Whilst the “no-Ponzi” condition of Blanchard and Fischer (1990) bounds government debt to a non-positive net present value, the fiscal budget may still be in deficit for considerable periods.<sup>2</sup> The political economy explanations of inefficient fiscal outcomes by Acemoglu (2006), and others relate to finite period strategic games without capital accumulation and are therefore not explanations of long-run economic growth. This is also true for the “soft budget constraint” literature, *per se*, which is comprehensively reviewed by Kornai et al. (2003).

In the orthodox tradition, the political entrepreneur is characterised (in its purest form) as an omniscient-benevolent governor (Brennan and Eusepi 2004) supported by a bureau head who is assumed to pursue the public good by following the dictates of the law, rather than personal interest. Our analysis departs from that of Buchanan (1969), who defines bureaucrats as economic eunuchs who follow rules only as automata because decisions are taken in a setting without a market (Buchanan 1969, especially Chap. VI). In our case, the political entrepreneur mimics Weber’s bureaucrats. However, not all types of institutional settings generate incentives for this kind of political entrepreneur, which in a Schumpeterian logic we could define as “paradoxical”.

Modeling bureaucratic behavior has long been a point of controversy among economists and political scientists. These researchers drew attention to the importance of the numerous variables incident to the organization of government agencies as a central mechanism in differentiating bureaucratic behavior. Chang et al. (2001) have revisited and revitalized the debate by focusing on rational choice theories. What concerns us most is what they call Wilson’s challenge. Wilson (1980, 1989) challenged the prominence of bureaucratic models for their oversimplification and inability to unearth all the subtleties and complexities intrinsic in them. His assumption is that “everything affects everything else”. We are left wondering whether such a statement can be accepted quite so simply because it is by no means a prerogative of bureaucratic organizations only; it is applicable to any type of organization and to everything *lato sensu*. Although Wilson offers insightful and valuable considerations about

<sup>1</sup> For example, Barro and Sala-i-Martin (1995) demonstrate that the outcomes for the Solow-style growth model are equivalent for both centrally planned and competitive models.

<sup>2</sup> Romer (2006) reports estimates that the US tax receipts would need to increase by a massive 8% of GDP to satisfy the fiscal budget constraint. This compares with federal revenues currently around 17% of GDP.

the best approach to study bureaucracy, his assumption that rational choice theory can be accepted only if it offers a single unified theory leads to rational pessimism. As Chang et al. show, rational choice theory is able to shed light on individuals' behavior within institutional structures.

Our distinction between a “long chain” and a “short chain” approach may serve as an example of how institutions favor bureaucrats' inclination to become either political dis-entrepreneurs or political entrepreneurs.

In addressing these issues, we contrast two different fiscal institutional settings that we call “long chain” and “short chain” models, respectively, and see how the Schumpeterian entrepreneur reacts in these two frameworks. The “long chain” organization reflects the Weberian and Niskanenian bureaucratic models characterized by an oversized bureaucracy revolving around a powerful bureau head. By contrast, the bureau head of the “short chain” decentralized fiscal organization faces a loss of information advantage relative to both the politician and voter-taxpayer (final principal). Inasmuch as the voter-taxpayers' information distortion is reduced, so is the cost of political and bureaucratic umpireship.

The following Sect. 2 analyses the extent to which the “long chain” organization, where the bureau head has informational advantages *vis à vis* his political sponsor, destroys the political entrepreneur's innovative drive. The bureau head, *à la* Niskanen (1994), pushes towards the maintenance of the *status quo*, so turning the political sponsor into a sort of Schumpeterian dis-entrepreneur, whose behaviour is not far from what Baumol (1959) has referred to as unproductive entrepreneur. Even with constitutional provisions in place, the “long chain” organization makes it easier to circumvent them because the transaction costs of managing a highly hierarchical organization are hidden. This, however, is not to say that this predicament is *incompatible* with a fiscal constitution.

Section 3 provides a model of the Schumpeterian political entrepreneur in his best achievable institutional structure based on a “short chain” organization and speculates on how the Schumpeterian entrepreneur has to abandon the “long chain” environment if he wants to apply his creative destruction in the realm of public economics. In the “short chain” organisation the political entrepreneur's policy is premised upon the notion of accountability; he thus performs in ways that are consistent with those of the Schumpeterian entrepreneur. In fact, what matters is the relationship between the voter-taxpayer and the politician, rather than that between the politician and the bureau head. As a result, the political entrepreneur has incentives to break the *status quo* and to pursue an innovative goal in the public sector, thus enhancing economic growth. The disciplining role played by an operational fiscal constitution emerges with strength here. Finally, Sect. 4 offers some concluding remarks.

## 2 The “long chain” model, the political dis-entrepreneur and the *status quo*

The political entrepreneur, as we know him, was in a sense a figure created by the Italian scholars in public finance at the beginning of last century.<sup>3</sup> However, such contributions have long been largely unknown abroad. In Italy, where they were familiar, they have been mostly interpreted as promoting a planned economy. Such an interpretation was rather due to an *ex post* insight provided by the events that took place in the Soviet Union two decades later, and not to an attempt at understanding what those Italian economists had in mind.

<sup>3</sup>See, for example, Montemartini (1902) and Barone (1908). The English reader may refer to Buchanan (1960). On political entrepreneurship see also Jones (1978)

Today we can read those early Italian contributions, especially Montemartini (1902), as a new conception of the role of the politician. Montemartini's analysis offered a novel way for the politician to decide on and provide local public goods, namely public urban transportation. We could well say that the concept of political entrepreneur was born long before the time Schumpeter (1939) elaborated his concept of the entrepreneur as the driving force of innovation able to break the *status quo*.<sup>4</sup>

Montemartini thought of the political entrepreneur (*imprenditore politico*) [*sic*] *qua* provider of local public services as an innovator breaking the organisational techniques of the *status quo*. His idea of the political entrepreneur as somebody motivated by vote *prima facie* would fit only our “short chain” model.

However, the entrepreneur's logic does not always translate smoothly into political entrepreneurship. And in fact, why in a “long chain” context should this political entrepreneur innovate? Innovation involves a reduction in politico-bureaucratic costs that automatically reduce the political entrepreneur's and bureau head's rewards.

In a “long chain” context, where a centralized tax system and a bureaucratic organization are outstanding features in the working of the maintenance of the *status quo*, the strain to balance the power between the bureau head and the bureaucratic base derails innovation. This point may result clearer by referring to De Viti de Marco (1936) one of the most outstanding scholar in the Italian school of public finance. According to De Viti the state *lato sensu* is a productive factor, thus the *minimum means* approach can be extended to public services. However, he realized that *minimum means* conflict with majoritarian decision-making processes. Forty years of public choice analysis has shown that the *minimum means* is not a goal either for the politician or the bureaucrats. In large measure the political entrepreneur is uninterested in innovation because innovating means threatening the *status quo*. Thus he might welcome innovation only if he sees external shocks coming. Even in this case, however, innovation is limited to restoring the *status quo*. His behaviour is assumed to be based on his desire to enjoy a quasi-permanent rent as long as he can. The *status quo* thus becomes his long run objective. The “long chain” organization can be thought of as a setting where the political entrepreneur can easily serve his desires fiscally unconstrained. There is thus a mismatch between political goals and economic wisdom which does of necessity produce a political dis-entrepreneur.

As a consequence, bargaining between the bureau head, who *promises* a certain level of service, and the political entrepreneur, who appropriates fractions of the budget for that service, is overwhelmingly favoured over innovation. The distinction between these two is essential because the bureau head does not generally have the authority to incur fiscal debt and may only spend what is legislated by the political entrepreneur. It is the cooperation between political entrepreneur and the bureau head that is important here.

Broadly, we can encapsulate the behaviour of the political entrepreneur and the bureau head by the following three necessary (and possibly sufficient) characteristics:

1. The maintenance of an elephantine bureaucratic base where assistants to assistants to assistants in the chain assure unreserved loyalty and trust to the bureau head because status, salary and power increase with the size of the bureaucratic organization;
2. Bureaucrats' goal of life-long posts;
3. The ability to increase budget provisions by the political entrepreneur.

<sup>4</sup>The joint role that Schumpeter's destructive creation and Tobin's  $q$  plays has been analyzed by Wilson and Chaudhri (2000). In that context, however, no attention was devoted to the institutional setting.

In pursuing this latter goal, the political entrepreneur will indeed make a strategic use of resources that is orthogonal to the principle of optimal allocation. Put another way, this means that the object of innovation is to give bureaucracy the capacity to have more leisure at the expense of taxpayers who bear the costs.

The mechanism which serves as a key element in a “long chain” organization is fiscal illusion. The creation of fiscal illusion is made possible by fiscal asymmetries (centralization of taxation and decentralization of spending) that characterize “long chain” organizations or unitary states, but also some federal states, for example Australia, where the unusually high degree of vertical fiscal imbalances in the federal government’s tax collection and distribution to the states is documented in Garnaut and Fitzgerald (2002).<sup>5</sup>

Whilst we do not analytically model the cause of fiscal illusion, we model its consequences, which allow the possibility of vertical imbalances in the form of central government budget deficits, which in turn become intertemporal imbalances through resorting to public debt. This can be shown in terms of a simple flow government budget constraint:<sup>6</sup>

$$\sum_{i=1}^n g_i + rb = \tau + \dot{b} \quad (1)$$

where the sum of the decentralised government expenditure,  $g_i(t)$ , for the  $n$  states or regions, may be greater than the centralised tax receipts,  $\tau(t)$ . The difference comprises the issue of government debt,  $\dot{b} = \frac{\partial b}{\partial t}$ , by the political entrepreneur (at the possible urging of the bureau head), which must be sufficient to pay the real interest on the stock of outstanding government debt,  $r(t)b(t)$ . The level of debt is usually constrained by the conditions of the form:  $\lim_{t \rightarrow \infty} b(t)e^{-\int_0^t r(s)ds} = 0$ , which bounds the solution.

However, the presence of fiscal illusion will involve a less constraining requirement. Consider the case where agents expect a balanced budget by the central government:

$$E(t) \sum_{i=1}^n \left[ g_i(t) - \frac{1}{n} \tau(t) \right] = 0.$$

This relationship shows that the expected sum of the regional budgetary positions is zero. The budget position is estimated as the difference between the observed government expenditure,  $g_i$ , and the unobserved tax collection in each region, which is proxied by the average estimate,  $\tau(t)/n$ . Walras’ law tells us that not all regions have to have a balanced budget, only that the regional budget positions must sum to zero. A budget deficit in one region must therefore be equally offset by a budget surplus in one or more other regions. We now assume that rational agents have incomplete information, which allows the possibility of vertical imbalances in the form of central government budget deficits. The informational inefficiency is assumed to be in terms of differential information along the lines of Barro (1976). Agents

<sup>5</sup>A fiscal structure characterized by centralized taxation and decentralized expenditure does not only assure politicians positional advantages, but it also allows the active illusion-seeking bureau head and political entrepreneur to enjoy positional rents without any costs (see Eusepi 2006). Fiscal illusion leads to a more far-reaching institutional strategy here than free-riding and moral hazard, although these latter concepts could possibly be seen as marginal subsets of fiscal illusion, operating within existing institutions.

<sup>6</sup>We assume zero population growth and drop the time subscript whenever possible, in order to keep the analysis simple. Importantly we assume a closed economy based on Rodrik’s et al. (2004) observation that trade is not a significant determinant of economic growth after institutions are controlled for.

may obtain regional (local) information more accurately and more readily than economy-wide (global) information. For example, a household may have relatively more knowledge of the local budgetary conditions affecting the region.

Economy-wide information on the stance of the central government budget may be less well known, or obtained with a lag in the form of official periodic announcements. This is particularly relevant for the unobserved central government's tax collections. The vertical imbalance is shown as the shift parameter,  $\varphi_i(z)$  which is non-zero in the presence of informational inefficiencies:

$$\sum_{i=1}^n \left[ g_i(t) - \frac{1}{n} \tau(t) \right] = \sum_{i=1}^n \varphi_i(z). \quad (2)$$

This allows the political entrepreneur to issue government bonds,  $b$ , to fund the overall budget deficit:

$$\sum_{i=1}^n \varphi_i(z) = b(t) > 0. \quad (3)$$

Given the intertemporal imbalance, we restrict the stock of government debt,  $b$ , to be less than capital stock,  $k$ , in net present value terms. This can be shown for the life of the political entrepreneur and bureau head's informational advantage, from the present (period 0) to period  $T$ :

$$b(t)e^{-\int_t^T r(s)ds} < k(t)e^{-\int_t^T r(s)ds}. \quad (4)$$

Solving the budget constraint (1) as a linear, first-order differential equation  $\dot{b} - rb + (\tau - \sum_{i=1}^n g_i) = 0$ , with variable coefficient,  $r$ , gives:<sup>7</sup>

$$b(t) = \int_0^t \sum_{i=1}^n g_i(t)dt - \int_0^t \tau(t)dt + b_0 e^{\int_0^t r(s)ds}.$$

This shows that the stock of debt,  $b(t)$ , at time  $t$  is equal to the sum of the budget deficits from time zero to  $t$ , plus the initial level of debt,  $b_0$ , exponentiated by the real interest rate,  $r$ .<sup>8</sup> Multiplying both sides by the integrating factor and letting time go to  $T$  gives the net present value relationship:

$$b(T)e^{-\int_0^T r(s)ds} = \int_0^T \sum_{i=1}^n g_i(t)e^{-\int_0^t r(s)ds}dt - \int_0^T \tau(t)e^{-\int_0^t r(s)ds}dt + b_0. \quad (5)$$

This intertemporal fiscal budget constraint clearly shows that the net present value of government expenditure is not forced to be equal to the net present value of taxation. The bureau head does not have to balance the budget because government debt can be non-zero (in net present value terms) due to the presence of fiscal illusion and the accommodating political entrepreneur. Equation (5) therefore determines the level of debt the political entrepreneur and bureau head are able to generate, subject to constraint (4), which requires the level of debt to be less than the stock of capital in net present value terms.

<sup>7</sup>The integrating factor,  $\exp(-\int_0^t r(s)ds)$  is also the net present value operator.

<sup>8</sup>The term  $b_0$  is the constant of integration.

Now let us consider the effect of government debt on the private sector. The representative household is assumed to select the time path of consumption,  $c(t)$ , to maximise intertemporal utility:<sup>9</sup>

$$u(c) = \int_0^{\infty} u[c(t)]e^{-\rho t} dt, \quad (6)$$

where  $u(c)$  is a concave instantaneous utility function and  $\rho$  is the household discount rate.<sup>10</sup> The budget constraint for the household is:

$$\dot{b} + \dot{k} + c = wl + rk + rb - \tau, \quad (7)$$

where the left-hand side shows expenditure and how household income may be consumed,  $c$ , invested,  $\dot{k}$  or used to purchase government bonds,  $\dot{b}$ .<sup>11</sup> On the net income side,  $rk$  and  $rb$  represent the household's income return from holding capital,  $k$ , and government bonds,  $b$ , with  $r$  the real interest rate. The real wage rate,  $w$ , is for the household labour,  $l$ , employed, whilst  $\tau$  is the tax paid by the household to the central authorities. We make the simplifying assumption that the central government imposes a fixed proportional tax rate,  $\alpha_\tau$ , which applies to total household income,  $y$ , so that household tax payments are given by  $\tau = \alpha_\tau y$  for  $0 < \alpha_\tau < 1$ . Substituting for  $\tau$  in (7) gives the modified budget constraint:

$$\dot{b} + \dot{k} + c = wl + rk + rb - \alpha_\tau y. \quad (8)$$

Household production,  $y$ , is assumed to be a function of household labour,  $l$ , and capital,  $k$ :

$$y = f(A_b, l, k, g_j) \quad \text{for } j \subseteq \{1, 2, \dots, n\}. \quad (9)$$

In addition to the factors of production,  $l$  and  $k$ , we include the effect of government expenditure,  $g_j$ , for the territories,  $j \subseteq \{1, 2, \dots, n\}$  which are relevant to household production.<sup>12</sup> These expenditure flows are Barro (1990) style representations of government activity, which capture externalities to give constant or increasing returns to scale. However, we define the production function importantly to include the effects of total factor productivity,  $A_b$ , which is assumed to be an inverse function of the stock of debt,  $A'_b = \partial A_b / \partial b < 0$  and  $A''_b > 0$ . That is, the increasing level of government debt causes inefficiencies in production.

Now household income from production, in the form of wage income and the return to capital used in production, will be equal to household production:

$$wl + rk = y. \quad (10)$$

Substituting (10) into (8) with  $\alpha = 1 - \alpha_\tau$  gives the new household constraint:

$$\dot{b} + \dot{k} + c = \alpha y + rb, \quad 0 < \alpha < 1. \quad (11)$$

<sup>9</sup>We assume a standard utility function with the usual properties  $u(0) = 0$ ,  $u'(c) = \partial u / \partial c > 0$  and  $u''(c) < 0$ .

<sup>10</sup>Given that we are modeling fiscal illusion it is important to allow possibly different discount rates between the household,  $\rho$ , and the bureau head issuing government debt at real return,  $r$ .

<sup>11</sup>Household saving is therefore used for investment,  $\dot{k}$ , and purchases of government bonds,  $\dot{b}$ .

<sup>12</sup>The production function is assumed to be well behaved with  $x(0) = x_0$ ,  $f'_x = \partial f / \partial x > 0$  and  $f''_x < 0$ ,  $\forall x \in \{l, k, g_j\}$ .

Setting up the Hamiltonian to maximise intertemporal utility defined in (6) with respect to (11) gives:

$$H = u(c)e^{-\rho t} + \xi(\dot{b} + \dot{k}).$$

If we assume that transaction costs in investing are important we can conveniently define the costate variable,  $\xi$ , as the net present value of Tobin's  $q$  at the current time period,  $t$ , that is,  $\xi = qe^{-rt}$ .<sup>13</sup> The Hamiltonian becomes:

$$H = u(c)e^{-\rho t} + q(\dot{b} + \dot{k})e^{-rt} \quad (12)$$

and the costate equation  $\dot{\xi} = -H_k$  gives:

$$\dot{q} = rq - [\alpha f'_k + (rb)'_k], \quad (13)$$

where  $f'_k = \frac{\partial f}{\partial k}$  and  $(rb)'_k = \frac{\partial(rb)}{\partial k}$ . Solving for Tobin's  $q$  gives the important result:

$$q(t) = \int_t^\infty [\alpha f'_k(s) + (r(s)b(s))'_k] e^{-r(s-t)} ds, \quad (14)$$

which shows that  $q$  is the sum of the net present values of future marginal products of capital and marginal interest costs of the stock of public debt relative to capital formation. In steady state,  $q = 1$  and  $\dot{q} = 0$ , which when substituted in (13) gives:

$$r = \alpha f'_k + (rb)'_k.$$

Substituting for  $(rb)'_k = r'_k b + rb'_k$  gives the solution for the steady state real rate of interest:

$$r = \frac{\alpha f'_k + r'_k b}{1 - b'_k}. \quad (15)$$

For  $0 < b'_k < 1$ , the interest rate will be above the marginal product of capital (adjusted for tax received by the central government). The size of this wedge is clearly a function of government debt. Unlike other endogenous growth models, the adverse effects of central government debt issue in the form of higher real interest rates represent the rent obtained by the bureau head as return to his informational advantage. This demonstrates our “long chain” model of fiscal illusion.

To see the effect on investment, remember that Tobin's  $q$  represents the marginal valuation of capital relative to its replacement cost. Higher (lower) values of  $q$  will encourage (reduce) investment according to the assumed generic investment function,  $\dot{k} = \Phi(q)$  with  $\Phi' > 0$ . Substituting for  $q$  using (14) gives capital formation as a function of the net present values of the marginal product of capital in production and the effects of the central government's public debt relative to capital:

<sup>13</sup>We do not explicitly specify the investment transaction cost function denoted  $\beta$ . The household constraint would become  $\dot{b} + \beta\dot{k} + c = \alpha y + rb$  and the function would require the properties  $\beta(0) = 0$  and  $\beta' > 0$ ,  $\forall \beta > 0$ . Alternatively, the production function could be defined as  $y = f(A, l, k, g_j) - \eta y$ , where  $\eta < 1$  represents the amount of  $y$  used in investment. The function becomes  $y = (1 - \eta)^{-1} f(A, l, k, g_j)$  which only differs from household production function by the constant of proportionality  $(1 - \eta)^{-1}$ .



$$\dot{k} = \Phi \left\{ \int_t^\infty [\alpha f'_k + (rb)'_k] e^{-r(s-t)} ds \right\}. \quad (16)$$

This relationship shows that there are a number of interesting effects operating here. The  $(rb)'_k$  term indicates a “crowding-in” effect on investment. That is, the fiscal illusion encourages capital formation which is the return to the rent-seeking behaviour of the bureau head. However, there are three offsetting effects to this. The first is the tax effect, which reduces investment since  $\alpha < 1$ . The second is the higher level of government debt, which reduces total factor productivity,  $f'_k$  because of the assumption of debt-based inefficiencies in production,  $A'_b < 0$ . Whilst these effects may be offsetting, the third effect of the debt will increase the real interest rate, which has the powerful consequence of reducing the net present value of  $q$ , which crowds out private investment. Empirical studies show the importance of crowding-out, which will negate any illusory investment in new productive capacity. This downward bias in capital accumulation is due to the vertical fiscal imbalance,  $\sum_{i=1}^n [g_i(t) - \frac{1}{n}\tau(t)] = \sum_{i=1}^n \varphi_i(z) > 0$ , which is non-zero in the presence of informational inefficiencies due to the powerful bureau head “long chain” organization allowing him to exploit informational rents. In this sense, the political entrepreneur discourages innovation and enforces the *status quo*, here in the form of  $\dot{k} = 0$ .

The fiscal illusion effects on household consumption can also be determined by substituting out the costate variable in the Hamiltonian maximisation to give:

$$\frac{\dot{c}}{c} = \theta \{ [\alpha f'_k + (rb)'_k] - \rho \}. \quad (17)$$

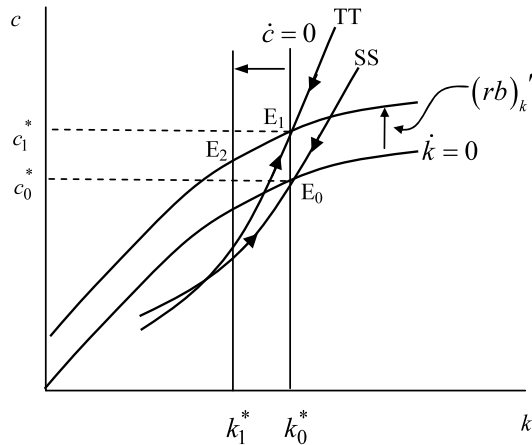
The rate of growth in consumption is inversely affected by the rate of time preference,  $\rho$ , and positively by the elasticity of intertemporal substitution,  $\theta$ .<sup>14</sup> There is also the positive effect of the marginal product of capital,  $\alpha f'_k$ , which allows faster growth in real output and consumption.<sup>15</sup> The presence of government reduces the growth in consumption because of the tax leakage on household income for  $0 < \alpha < 1$ . However, there is an additional positive effect on the growth in consumption of  $(rb)'_k$  due to the higher real rate of interest caused by the fiscal illusion allowing increases in the central government debt. Turning this argument around, the higher real interest rate relative to the household’s rate of time preference,  $r > \rho$ , is required to compensate the household for foregoing some present consumption for future consumption. The degree of compensation is given by the elasticity of intertemporal substitution,  $\theta$ . The lower initial level of consumption therefore requires a higher growth rate in consumption,  $\dot{c}/c$ .

These effects are shown in Fig. 1 with long-run steady state at point  $E_0$  and consumption,  $c_0^*$  and capital,  $k_0^*$ , associated with  $\dot{c} = 0$  and  $\dot{k} = 0$ . The transitory dynamics are demonstrated by the saddlepath SS. Schematically, greater fiscal illusion will shift the  $\dot{k} = 0$  locus vertically upwards according to the constraint (11). The steady-state consumption locus,  $\dot{c} = 0$  defined in (17), will not shift because of the assumption that the higher value of  $(rb)'_k$  will increase the real interest rate by the same amount so that the marginal product of capital, and therefore the stock of capital, will stay the same. Note that the new saddlepath solution

<sup>14</sup>The elasticity of marginal utility with respect to consumption is given by the negative inverse of  $\theta$ , that is,  $-1/\theta = cu''(c)/u'(c)$ . Lower values of  $\theta$  indicate consumers’ increased preference for consumption smoothing.

<sup>15</sup>An increase in productivity,  $f'_k$ , will also increase the valuation of capital and the rate of capital formation via (14) and (16) and therefore the growth rate in consumption.

**Fig. 1** Possible effects of “long chain” political institutions on consumption and capital



TT to the new steady state  $c_1^*$  is associated with higher levels of consumption.<sup>16</sup> However, the steady-state level of capital is unchanged at  $k_0^*$  due to the previously explained offsetting “crowding-in” and crowding-out effects, consistent with our explanation of fiscal illusion maintaining the *status quo* in this “long chain” institutional representation.

Interestingly, if the bureau head’s informational advantage allows further rent-seeking by forcing the increase in the real interest rate to be more than the increase in  $(rb)_k'$  then the  $\dot{c} = 0$  locus will shift to the left towards  $E_2$ . This is because the required increase in the marginal product of capital will necessitate a lower steady-state level of capital at  $k_1^*$ .<sup>17</sup> On the other hand, political pressure to reduce the real interest rate will shift the steady-state level of capital above  $k_0^*$ , which promotes economic growth. This introduces the notion of the “short chain” organisation, which will be considered in the next section.

### 3 The “short chain” model, the Schumpeterian entrepreneur and growth

Institutional economics and growth economics are fields which have worked in a sort of mutual isolation until the 1970s. Our purpose here is to move matters slightly further forward and provide some benefit to the literature addressing interdisciplinary issues on institutions and growth. To this end we modify the assumptions used to develop the model in the previous section in order to convert it from a “long chain” to a “short chain” model.

As we have seen in the “long chain” organization, the bureau head’s behaviour goes against the grain of a Schumpeterian entrepreneur and creates fiscal illusion in order to produce positional rents. The claim that changes in the political entrepreneur’s behaviour depend almost exclusively on the creation or strengthening of the constitutional binding—which safeguards only future generations in our analysis—might, however, be misleading. In fact, it is by no means the introduction of a fiscal constitution alone that spurs the political entrepreneur to behave virtuously. A fiscal constitution operates as a brake only if the size of the labyrinthine “long chain” organization is reduced to a “short chain” one. It is in fact, the latter that allows the relationship between voter and political entrepreneur to turn into a

<sup>16</sup>Note the possibly lower level of initial consumption for the saddlepath solution TT.

<sup>17</sup>The outcome for the new steady state consumption level at  $E_2$  will not be analytically derived here.

principal-agent contract. Predictably, in a “short chain” model the bright line that separates the political entrepreneur and the bureau head becomes blurred. This switching of regimes is apt to bring about a sort of managerial revolution. Under the spur of gaining his re-election, the political entrepreneur acts in the role of a profit-seeker rather than a rent-seeker. Not only does this prevent the politician from behaving as a non-Schumpeterian or political dis-entrepreneur, but it also provides incentives for him to innovate. Central to this contractual, though attenuated, logic (which we could call a quasi-contract) is the profoundly changed relationship between governments and governed.

The quasi-contractual form of the “short chain” organization involves a prevailing co-operative relationship among all agents within the system, thus the innovative role of the Schumpeterian entrepreneur is partly guaranteed. While the political entrepreneur is able to reap some profit from innovation, this capability never assumes the form of rent-seeking.

The breach of the *status quo*, not its *persistence*, is also the goal for the political entrepreneur who has to cover costs. Hence, in modeling our “short chain” organization we draw upon the Schumpeterian entrepreneur. It is precisely for this reason that in what follows we have linked the “short chain” model, in which the Schumpeterian political entrepreneur plays a fundamental role, with growth. It is the innovative role that the political entrepreneur plays that makes our model appropriate in explaining growth.

We think of a “short chain” model as being governed essentially by a horizontal relationship of a *quasi*-contractual nature and it is the rendering of what in the “long chain” model was a hierarchical or vertical relationship. A “short chain” model is characterised by two related although separated *quasi-contracts*: That between voter and political entrepreneur, and that between political entrepreneur and bureau head. In this context, the agency relationship is more likely to function at lower costs due to the constitutional budget balance requirements that prevent conflicts between the political entrepreneur and the bureau head from being solved by resorting to fiscal illusion.

On the other hand, in a “short chain” model<sup>18</sup> local taxpayers are asked to cover the total cost of each project. A model in which the bureau head behaves as a faithful agent towards the political entrepreneur and so too does the political entrepreneur towards the voter-taxpayer (his principal), involves a sort of generalised partaking in the enterprise. So what interests the political entrepreneur is to *create* profits.

A “short chain” model, in which the political entrepreneur of the “long chain” model is replaced with many political entrepreneurs, is in line with the Schumpeterian entrepreneurial logic. Because such governments have also an *exclusive* territorial competence, they are full-fledged monopolist political entrepreneurs.<sup>19</sup>

In deepening this concept we must analyse the context that relates to the positions of the political entrepreneur and the bureau head. Both are necessarily worse off than in a “long chain” context exactly because the innovation effects are appropriated to the community and are only partly in the hands of the entrepreneur. This prevents the bureau head from appropriating resources through the fiscal illusion device.

It is precisely because the political entrepreneur and the bureau head positions would be worse off in the “short chain” model that their respective activities will tend to work towards

<sup>18</sup>The “short chain” model is internally consistent and descriptive of the real world settings only if also the fisc has a “short chain” organization.

<sup>19</sup>The “short chain” model, however, does drastically reduce the political entrepreneur’s supply power for reasons that are too obvious to be mentioned here. See among others Tiebout (1956) and Olson (1969). For a critique of the territorial dimension as an optimizing criterion see Eusepi (2000).

the *status quo* in the “long chain” setting<sup>20</sup> and the maintaining of the institutions that make this possible.

Examining the shifting from a “long chain” to a “short chain” organization is far from being unproblematic. This paper is only a first attempt to link alternative institutional settings with growth. Our investigation of the Schumpeterian entrepreneur thus ignores (or “sidesteps”) the process that led to the “short chain” organization in the first place. The distinctive feature of this model is the partial socialisation of the profits stemming from a “short chain” model, which lead to a greater economic growth. Indeed, the political entrepreneur is compatible with the Schumpeterian entrepreneur because he risks losing his capital (i.e., the *status quo*) since the innovation/growth strategy employed by the political entrepreneur is an instrument for building his electoral victory. By assuming the rational individual considered by standard public choice, one might run up against theoretical and feasibility limits (Brennan and Lomasky 1993).

Central to the “short chain” organization is the removal of the possibility of fiscal illusion caused by the political entrepreneur and bureau head having an informational advantage over the private sector. The fiscal constitution removes the informational inefficiency so that agents know the tax receipts for each region.<sup>21</sup> The previously estimated unobserved tax collected by the central government,  $\frac{1}{n}\tau(t)$ , is replaced by the actual tax receipts,  $\tau_i(t)$ , for each region  $i$ . The government budget (2) becomes:

$$\sum_{i=1}^n [g_i(t) - \tau_i(t)] = \sum_{i=1}^n \varphi_i(z), \quad (18)$$

which removes the vertical imbalance in the form of government debt issue. We therefore specify the standard condition on the stock of debt:

$$\sup \left\{ \lim_{t \rightarrow \infty} b(t) e^{-\int_0^t r(s) ds} \right\} = 0. \quad (19)$$

Note that this frequently misunderstood condition simply requires the net present value of government debt to be zero. It therefore allows the possibility of government debt, provided it is matched by future budget surpluses which balance out this debt in net present value terms. This transforms the net present value budget relationship (5) to:

$$\int_0^T \sum_{i=1}^n g_i(t) e^{-\int_0^t r(s) ds} dt - \int_0^T \tau(t) e^{-\int_0^t r(s) ds} dt + b_0 = \lim_{t \rightarrow \infty} b(T) e^{-\int_0^T r(s) ds} = 0, \quad (20)$$

which rules out the possibility of fiscal illusion creating additional debt according to (3).

The new constraint is of the Ricardian Equivalence type, in that agents realise that current debt must be paid for in the future.<sup>22</sup> Consistent with this, we force the household to fully discount the interest payments on debt holdings, as argued by Barro (1974, 1989) and Buchanan (1976). The household budget constraint (11) reduces to:

$$\dot{b} + \dot{k} + c = \alpha y, \quad 0 < \alpha < 1 \quad (21)$$

<sup>20</sup>Although there may appear to be a semantic dissonance between entrepreneur and *status quo*, there is a perfect logical compatibility in the “long chain” model.

<sup>21</sup>We continue to assume that agents accurately observe the level of regional government expenditure.

<sup>22</sup>This is a much broader interpretation of Ricardian equivalence which allows the substitution of taxes and debt, holding the level of government expenditure fixed (see Barro 1974, 1989 and Buchanan 1976).

and the Hamiltonian which maximises intertemporal utility defined in (6) with respect to (21):

$$H = u(c)e^{-\rho t} + q(\dot{b} + \dot{k})e^{-rt} \quad (22)$$

derives:

$$\dot{q} = rq - \alpha f'_k. \quad (23)$$

The solution for Tobin's  $q$  is:

$$q(t) = \int_t^\infty \alpha f'_k(s) e^{-r(s-t)} ds \quad (24)$$

and the steady state solution for the real interest rate is now:

$$r = \alpha f'_k. \quad (25)$$

When compared with the result in (15), the absence of fiscal illusion removes the wedge between the real interest rate and the marginal product of capital (net of the tax effect). Remember that this difference, equal to  $(rb)'_k$ , represents the rent previously obtained by the bureau head due to the informational advantage. However, the “crowding-in” effect of this fiscal illusion in terms of higher value of Tobin's  $q$  and investment will also be removed.<sup>23</sup> Balancing this is the lower real interest rate, which will reduce the previous crowding-out of private investment. In addition, the reduction in government debt will reduce the debt-based inefficiencies in production which will result in an increase in total factor productivity ( $A'_b < 0$ ). This is consistent with the explained change in the institutional setting away from the bureau head's attempts to maintain the *status quo* to the political entrepreneur who wishes to pursue economic growth.

Remember, the “short chain” model characterises quasi-contractual relationships which encourage the Schumpeterian political entrepreneur continuously to innovate. This ongoing incentive to exploit profits is the driving force of economic growth in this model. As explained earlier, economic growth is further encouraged by the lower real interest rate in the absence of fiscal illusion and the removal of the production inefficiencies due to lower levels of fiscal debt.

Indeed the impetus to innovate can be modeled more explicitly using Tobin's  $q$  in a Schumpeterian “creative destruction” explanation of economic growth. This will demonstrate our “short chain” model of the profit-seeking political entrepreneur.

Consider again the general investment equation, which is function of Tobin's  $q$ :

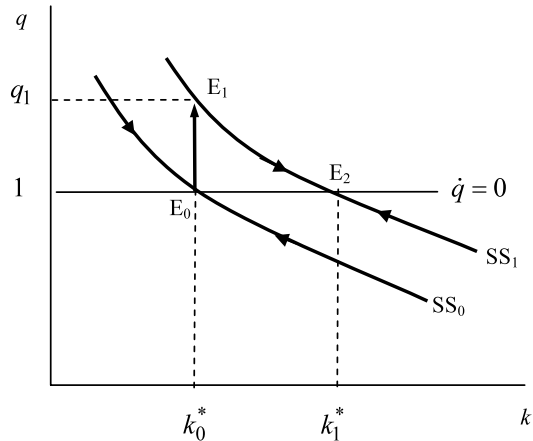
$$\dot{k} = \Phi(q), \quad \Phi' > 0. \quad (26)$$

The relevant dynamic equations which describe the evolution of  $k$  and  $q$  are given by (23) and (26). Linearising these equations of motion around the steady state values,  $k = k^*$  and  $q_a = 1$ , gives the system of equations:

$$\begin{bmatrix} \dot{k} \\ \dot{q} \end{bmatrix} = \begin{bmatrix} 0 & \frac{\partial \dot{k}}{\partial q} \Big|_{q=1} \\ -f''_k \Big|_{k=k^*} & r \end{bmatrix} \begin{bmatrix} k - k^* \\ q - 1 \end{bmatrix}. \quad (27)$$

<sup>23</sup>Remember that investment is a positive function of Tobin's  $q$ , with  $\dot{k} = \Phi \int_t^\infty \alpha f'_k(s) e^{-r(s-t)} ds$ .

**Fig. 2** Effects of “short chain” political entrepreneurship on investment and capital



The general solution for initial values  $k_0$  and  $q_0$  are given by the relationships:  $k - k^* = (k - k_0)e^{\gamma t}$  and  $q - 1 = (q - q_0)e^{\gamma t}$ . Solving (27) and selecting the negative characteristic root,  $\gamma$ , gives the locally stable, globally unstable saddlepath solution:

$$q = 1 + \left( \frac{k - k^*}{r - \gamma} f_k'' \right). \quad (28)$$

This is shown as the  $SS_0$  saddlepath in Fig. 2. If the capital stock is below the steady-state level,  $k < k_0^*$ , then from (28),  $q > 1$ , which causes the capital stock to grow,  $\dot{k} > 0$ . The economy will therefore move along the locally stable saddlepath,  $SS_0$ , in the direction of the arrow until the steady state is reached where  $k = k_0^*$  and  $q = 1$  at  $E_0$ .

Given this dynamic explanation of economic growth it is now easy to incorporate the effects of a political entrepreneur who attempts to innovate in order to increase profits. The innovation, in the form of increased marginal productivity of capital, will increase  $f_k''$  in (28), which will cause the saddlepath solution to shift vertically up to  $SS_1$ . The value of Tobin's  $q$  will increase to  $q_1 > 1$  at  $E_1$  and the ensuing growth, as indicated by the dynamic movement down along  $SS_1$ , will increase the capital stock until it reaches the new steady state at  $E_2$ , with  $k_1^*$  with  $q = 1$  again. This describes an endogenously driven process of Schumpeterian “creative destruction” in that higher profits associated with the new technology at  $E_1$  “destroy” the previous profits and existing technology at  $E_0$ . Of course the process does not need to end there because there is the continuing incentive for the political entrepreneur to further innovate, causing the Tobin's  $q$  shadow prices to be continually greater than unity, so that capital and output will grow endogenously.<sup>24</sup>

<sup>24</sup>This process of economic growth contrasts strongly with the “long chain” version where the rent-seeking bureau head uses his informational advantage to maintain the status quo, shown by the position  $E_0$  in Fig. 2 with unchanged steady state  $q = 1$  and capital fixed at  $k_0^*$ . This is consistent with this value at  $E_0$  and  $E_1$  in Fig. 1 and the key to this difference is the presence of informational inefficiencies in the “long chain” model which allows for positive government debt,  $\sum_{i=1}^n \varphi_i(z) > 0$ , via the positive intertemporal budget constraint.

## 4 Conclusions

We have shown using standard public choice concepts and a Schumpeterian-style endogenous growth model how the political entrepreneur responds to incentives offered by the constitutional-institutional setting.

Namely, we have developed two alternative theoretical paradigms: the “long chain” model and the “short chain” model of long-run economic growth. We have indicated the reasons why in the “long chain” model there is no possibility to shift the logic of the Schumpeterian entrepreneur from the economic domain to the politico-bureaucratic environment. This is so because incentives push the political entrepreneur to seek political rents that the existing *status quo* allows him to secure. This creates a political dis-entrepreneur’s behaviour of “destructive creation” of capital.

The “long chain” model thus favours an adverse selection among potential political entrepreneurs. They, in fact, follow Gresham’s Law whose effect is that of originating the maximal state. This in turn gives rise to something resembling the so-called stationary state *à la* Ricardo where political rents are rising and economic profits tend to zero, which is a situation incompatible with growth.

Conversely, we have contended that the “short chain” model allows the Schumpeterian entrepreneur to be transplanted into the political arena. There are incentives to adopt new technology because its value according to Tobin’s  $q$  dominates the economic rents of existing capital.

In this connection, it should be emphasised that our purpose was not that of showing that the “short chain” model and the connected fiscal constitution originate the *minimal state*, nor that of showing that the minimal state is the institutional setting allowing for the *maximal* economic growth. We have simply sought to demonstrate analytically that the “short chain” model, where innovation becomes a *survival* threshold for the political entrepreneur, ensures a higher growth rate *vis à vis* the “long chain” model.<sup>25</sup>

The contribution of this paper is the demonstration that in a “long chain” model there is room only for the political dis-entrepreneur whose main interest is that of keeping obsolete techniques, which are instrumental to the maintenance of the *status quo*.

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<sup>25</sup>Our “short chain” model also is consistent with the political entrepreneur outsourcing public goods provision to private producers. We would like to thank an anonymous referee for pointing this out.

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