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## PROMISCUOUS ELITES, THE REVOLVING DOOR, AND ECONOMIC GROWTH

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### Abstract

The “revolving door” is a phenomenon quite widely in use in developed countries. The purpose of this paper is to present a new framework on elites, which can explain some of the empirical regularities related to the revolving door.

The paper shows that the political elite finds it optimal allowing the existence of the revolving door and the creation of bureaucratic capital. The political elite could restrict the possibility of the revolving door, but this would mean to reduce the ability of the bureaucratic elite in the economy, which would lead to lower economic growth. In other words, the paper shows that the revolving door and the creation of bureaucratic capital are necessary in order to get an equilibrium with higher economic growth.

Keywords: elites, bureaucracy, abuse of power, revolving door, economic growth

JEL classification: H10; H70; O11; O43.

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## I. Introduction

The “revolving door” is a phenomenon quite widely in use not only in the United States but also in Europe and Japan.<sup>1</sup> After completing their bureaucratic terms, heads of state agencies are frequently entering the very sector they have regulated, and over the last decade, the waltz-like tempo of prominent figures moving from public-sector positions to the business world has become brisker.<sup>2</sup>

There are two main theories which are related to the revolving door: the *regulatory capture*, and the *lobbying capture*, but none of them can explain some of the latest empirical results on the revolving door. Indeed, Luechinger and Moser (2012) have shown that just after the revolving door is in action, there are changes in the stock market prices. More specifically, they show that after the announcement of an appointment to the board of governors of a former bureaucrat, there are positive abnormal returns to the firm for few days. Goldman et al. (2009, 2010) find similar results.<sup>3</sup>

The purpose of this paper is to present a new framework which can explain some of the empirical regularities related to the revolving door. In this framework, as in the previous theories, there are conflicts of interests, but they are not unlawful, just unethical.

First let us note that *Regulatory capture* occurs when a regulator will be “captured” by one specific firm, and while strict with the other ones, he will be lenient with this firm in order to be hired by it after leaving office. This form of revolving door is linked to corruption and is unlawful (the literature is presented below).

The second form of revolving door is *lobbying capture*, wherein after leaving office, the bureaucrat is hired by a lobbying firm and will lobby on behalf of companies that are the firm’s clients (see Blanes et al., 2012). The bureaucrat influences his former associates to implement or shape policy to benefit his new employer’s clients. While lobbying capture is not illegal, its behaviour incorporates strong elements of conflict of interest, but in many Western countries this wrongdoing is legally accepted.<sup>4</sup> However, this form of revolving door is not linked to the empirical regularities stressed, since lobbying firms are not related to the positive stock market reaction.

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<sup>1</sup> Revolving door is coined “pantoufage” in French, and “amakudari” (“descent from heaven”) in Japanese. For the preponderance of the phenomenon in France, see Charle (1987).

<sup>2</sup> The list of these people is long, just to name a few: Alan Greenspan, Glenn Hubbard, Robert Zoellick, Dick Cheney, and Larry Summers. See also Table 1.

<sup>3</sup> The revolving door works both ways. This paper focuses only on the passage from the bureaucratic elite towards the business elite, while the empirical analysis focuses on both ways.

<sup>4</sup> The US Senator Breaux even claimed: “My vote can’t be bought, but it can be rented”. Senator Breaux, after leaving office, went to work for a lobbying firm and among his clients are found: Citigroup, Goldman Sachs, GE, AT&T, and PhRMA.

This paper proposes a new explanation based on the creation of *bureaucratic capital*, and which can explain the abnormal returns for corporate appointment, without this behavior being unlawful. It seems difficult to believe that changes in stock market would be due to illegal action, without scrutiny of the SEC about some wrong doing. It would even be embarrassing that unlawful behavior goes on without being checked and stopped.

In consequence, there is a need for a new explanation, which is not based on illegal behavior as is the regulatory capture, but which also leads to some "abnormal returns" for a short period of time, just after hiring a "revolving door" official.

This concept of *bureaucratic capital* can explain the use of the revolving door and the creation of value for the firms in the short run. It is based on unethical *abuse of power*, but which is not illegal.

The model is based on the supply and demand of *bureaucratic capital*. On one hand, during office, the bureaucrat while taking care of being a good regulator also take actions while in office, which will enable him later on to cash in when joining a firm he has regulated, actions which is coined as *bureaucratic capital*.

The most common type of investment in *bureaucratic capital* takes the form of investing in good relationships with the lower bureaucracy, ties which will help him in the future. Another form of bureaucratic capital includes the creation of specific knowledge on the ins of the system. Although unethical, this abuse of power is perfectly legal, and can explain the empirical regularities linked to the revolving door.

However, why would the political elite permit such an unethical behavior? This paper, by analyzing the interconnection between the three elites in power – the political, the bureaucratic and the business elite, shows that it is optimal to allow such an abuse of power.

Indeed, I develop a model in which the players in this market are the various elites, whose promiscuity generates bureaucratic capital, which in turn engenders optimal abuse of power. Hence, revolving door is optimal even if unethical.

Let us define the specific role of each elite. Starting with the bureaucrats, they are appointed by the political elite in order to regulate the economy, so as to increase its productivity. Yet, the bureaucrats do not merely enact efficient regulation; they also add rules and regulations, and invest in good relationship with the lower bureaucrats. As the engineer of these rules, regulations and relationships, the regulator has better knowledge of the ins and outs of the system, including any loopholes that might exist.

This bureaucratic capital will enable him to cash in later on, after exiting the revolving door, and joining the business firm in the sector he previously regulated. Thus, the bureaucrat can abuse power and increase his income in a perfectly legal way.

The second player in this framework is the business elite. The business elite finds the knowledge accumulated by the bureaucrat valuable. Thus, once the latter has left the civil

service, he will indeed be offered a job, such as joining the board of directors, allowing him to cash in on the *bureaucratic capital* he has accumulated.

The third player is the political elite, which appoints the bureaucrats and care about letting the economy have the highest economic growth possible. The question raised by the existence of a market for *bureaucratic capital* is: Why does the political elite, for which economic growth is a priority, not find a way to prevent the bureaucratic elite from creating *bureaucratic capital*?

This paper shows that the political elite does not act to abolish abuse power and bureaucratic capital. On the contrary, it finds it optimal to let the bureaucratic elite create *bureaucratic capital*, which actually has a negative effect on economic growth.

The intuition behind this result is the following: Bureaucrats are heterogeneous in their abilities, and more able bureaucrats do a better job of regulation. A better head of an agency enables higher productivity of his sector, in turn enabling higher economic growth.

In order to recruit quality bureaucratic elite, governments should pay them well. However, salaries in the public sector are not very high. An easy way to let regulators have high income, so that they will be of high quality, is by legislators' closing their eyes to the fact that the bureaucrats can cash in on the bureaucratic capital they have created while serving as heads of agencies.

Thus, the political elite faces a tradeoff between having high-quality bureaucrats and letting them create bureaucratic capital. The optimal solution is a non-corner one, wherein bureaucratic capital is created. Creation of redundant regulations is accepted by the political elite, because it is pushing economic growth to a higher level.

So the first result of this model is that in order to obtain higher rate of growth, it is necessary to accept the creation of bureaucratic capital. The second result of this paper is that the market equilibrium will not bring the economy to the highest rate of growth, and the level of bureaucratic capital is higher than the optimal one. The reason is that in fact, while this bureaucratic capital is valuable to the firm, it is a social waste.

This paper is mostly related to the literature on bureaucratic elite and on the revolving door. The sociological literature on the role of bureaucratic elite in promoting economic growth has followed the pioneering work of Weber (1968).<sup>5</sup> The economic literature on the bureaucratic elite related to the revolving door started with the works of Stigler (1971) and Peltzman (1976) followed by Eckert (1981). They have developed the models of *regulatory capture*.

Most researchers in this field have focused on the potentially undesirable effects of

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<sup>5</sup> For a synthesis on the sociological literature, as well as an analysis on the Weberian structure, see Evans and Rauch (1999). For a summary on the economic literature on elites, and especially on the effect of interconnection of elites on economic outcomes, see Brezis and Temin (2008).

corruption and regulatory capture, and solutions that could be implemented (Spiller, 1990, and Brezis and Weiss, 1997).<sup>6</sup> However, there are also works that show that there may be positive aspects to the revolving door that should not be overlooked (Salant, 1995, and Che, 1995). In the next section, we present a model which relates the interconnection of elites to the abuse of power of the bureaucratic elite.

The paper is divided in four parts. In Part II, we present the model. In Part III, we present the equilibrium, and Part IV concludes.

## II. The Model

### 1. Introduction

The specificity of this paper is to develop a model that includes the three power elites (political, business and bureaucratic), and introduce a new market: the market for *bureaucratic capital*. In this market, the *supply* of bureaucratic capital is determined by the bureaucratic elite, while the *demand* is determined by the business elite; and the equilibrium between supply and demand determines the level of bureaucratic capital. This new market will permit to explain (i) why firms want to pay rents for hiring a previous regulator in their board, an (ii) why the political elite permits such revolving door phenomenon.

The model analyzes whether this equilibrium leads to the highest rate of economic growth, which is the political elite's goal (while they appoint regulators, and choose the most able ones). Since regulators are heterogeneous in their abilities, and their abilities affect the productivity of the workers in the R&D sector, we obtain that the rate of economic growth is a function of two elements related to the bureaucrats: their abilities, and their levels of bureaucratic capital.

This paper shows that from the point of view of the political elite, it is optimal to allow the bureaucrat to create bureaucratic capital. However, the level of bureaucratic capital determined by the bureaucratic and business elites is higher than the optimal one for the political elite. This is so because, bureaucratic capital is, *ceteris paribus*, generating higher income for the firm, but finally in equilibrium, it is a social waste.<sup>7</sup>

The model will be presented in the following way. We begin by presenting the production functions, we then address the behavior of the various elites; and then we display the rate of economic growth as a function the elites' behavior.

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<sup>6</sup> For works on corruption, see Shleifer and Vishny (1993), Mauro (1995) and Bardhan (1997). See also Niskanen (1975), Margolis (1975) and Banerjee (1997). See also Besley and McLaren (1993).

<sup>7</sup> This effect explains that while the value of the firm goes up for a while, it has no long-run effects.

## 2. The final good sector

Following Romer (1990), the economy produces one final homogenous good,  $Y$  which is consumed. This good is produced with labor and intermediate goods, and the production exhibits constant returns to scale. The intermediate goods  $x_j$  consists of monopolist firms, and the only factor that leads to growth is the increase in the number of new technologies existing, which are developed in the R&D sector, and which are embedded in new intermediate goods available on the market. There is no growth of population, and capital is constant.

The workers can work in two sectors: the production sector, and the R&D sector. The workers are homogenous in their ability and get wages determined endogenously in the model.

The production function of the final good is:<sup>8</sup>

$$Y = L_y^{1-\alpha} \cdot \int_0^A x_j^\alpha dj \quad (1)$$

where  $Y$  is the output at each period;  $L_y$  - the number of workers in the production sector;  $x_j$  the number of intermediate goods/machines from type  $j$ ; and  $A$ , the level of technology, measured by the range of capital goods available.

While the final good is produced in a perfect competitive environment, the intermediate-goods sector consists of monopolistic firms, which each produce a specific intermediate good,  $x_j$ .

The firms involved in the production sector,  $Y$  are maximizing profits:

$$\text{Max } L_y^{1-\alpha} \cdot \int_0^A x_j^\alpha dj - w_y L_y - \int_0^A p_j x_j dj \quad (2)$$

$w_y$  are the wages paid for labor in sector  $Y$ , and  $p_j$  is the price of the intermediate good  $x_j$ .

From the profit maximization in the production sector, we get:

$$w_y = (1 - \alpha) \frac{Y}{L_y} \quad (3)$$

and

$$p_j = \alpha L_y^{1-\alpha} x_j^{\alpha-1} \quad (4)$$

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<sup>8</sup> The production functions follow the adaptation of Jones (1995) to Romer's model (1990).

### 3. The Elites

Following the literature on elites, we assume that society is split up into the elite, and the non-elite. The elites themselves are not homogenous and split up into those with power, the power-elite, and those without power, which are usually composed of workers with human capital, for whom their income is a function of their ability.<sup>9</sup> Following the literature in which income is a positive function of ability, we assume that, in this social stratum, income is a function of ability (see Weiss, 1980).

The power elite itself is composed of political, business and bureaucratic elite. We now turn to develop more specifically the role of each elite.

#### 3.1 The bureaucratic elite and the supply of bureaucratic capital

The intermediate-goods sector consists of monopolistic firms and in consequence, they are regulated by the bureaucratic elite, who consists of regulators nominated by the political elite. The regulators maximize the present value of their income, while the business elite maximizes profits of the regulated firms.

During his time in office, the regulator regulates and receives an income, but at the same time, he creates *bureaucratic capital*. The regulator has better knowledge of the ins-and-outs of the system, and of any loopholes that might exist. This knowledge is valuable to the firms in the industry, and thus, once he has left the public service, the regulator can cash-in on this bureaucratic capital.

The structure of the model is simple. During his term as a regulator, he acquires bureaucratic capital of size  $H_i$ , which costs him effort of size  $E_i$  in monetary terms. We assume that the level of bureaucratic capital is a concave function of the amount of effort invested: <sup>10</sup>

$$H_i(E_i) = [(1 + \gamma)E_i]^{1/\gamma} \quad \gamma > 0 \quad (5)$$

Then comes another regulator, who succeeds him. After leaving his job as regulator, the bureaucrat works for a period of length  $\tau$ , in the industry that he regulated. He

<sup>9</sup> On the power elite, see Mills (1956), and Brezis and Temin (2008).

<sup>10</sup> We are aware that for some bureaucrats, who are either more social, or with less “ethical values”, it is easier to either create connection with other people, or create redundant regulations. For purpose of simplicity, we assume that bureaucrats have the same “production” function of bureaucratic capital, and that these social factors are not linked to ability, since removing this assumption does not affect the results. Moreover, the “effort” which describes either social or ethical costs, are in monetary terms.

receives in top of his "regular" salary, a rent related to the "bureaucratic capital",  $H_i$  he has accumulated.

The regulator maximizes his lifetime income which consists of (i) earnings which are not related to the creation of bureaucratic capital, denoted  $\Omega$ , and (ii) of income related to the creation of bureaucratic capital, which equals to the net income he gets when having entered the industry. After passing the revolving door, he will be able to sell his bureaucratic capital,  $H_i$  at price  $q$  for a number of years  $\tau$  so that his total income is:

$$V_i = \Omega - E_i + \tau q H_i (E_i) \quad (6)$$

Equation (6) can be rewritten as a function only of the level of bureaucratic capital, by substituting  $E$  from equation (5). We get:

$$V_i = \Omega - \frac{H_i^{1+\gamma}}{1+\gamma} + \tau q H_i \quad (7)$$

From the point of view of the bureaucrat, there is an optimal level of bureaucratic power,  $\hat{H}_i$  he wants to stock, which maximize his income - equation (7) and is:

$$\hat{H}_i = (\tau q)^{1/\gamma} \quad (8)$$

Equation (8) describes the "supply" function of bureaucratic capital by the bureaucratic elite as an increasing function of the price  $q$ , which is quite intuitive and which is displayed as the S function in Figure 1, part (I). We now turn to discuss the behavior of the business elite and its demand for bureaucratic elite.

### 3.2. The Business elite and the Demand of Bureaucratic Capital

The business elite is composed of entrepreneurs, who are at the head of intermediate-goods firms, who own a patent developed by the R&D sector, and who produce goods,  $x_j$ , in a monopolistic competitive environment.

The output is a function of two factors of production. The first is capital,  $k_j$ ; Following the standard Romer model, we assume that the production function takes the simple form:

$$x_j = k_j.$$

However, in our model, the output  $x_j$  is also function of a second factor of production, which is the level of bureaucratic capital the firm gets from the ex-regulator it

has hired. When a firm  $j$  hires a bureaucrat with a bureaucratic capital  $H_j$ , the production of output  $j$  becomes more efficient. This is so, because the regulator has a better knowledge of the system and of the loopholes that exist.

However, empirical results have shown that the effects are not long lasting, so we find it essential to add that the effect of the bureaucratic capital in firm  $j$  depends also on the level of bureaucratic capital of other firms, since what matters is the *relative* effect of the regulator. More specifically, it depends on the relative level of bureaucratic capital by the different regulators of the different sectors, which in equilibrium will lead to the fact that there are no long-run effects.<sup>11</sup>

So the production function in sector  $j$  takes the form:

$$x_j = k_j \left( \frac{H_j}{H_a} \right)^\phi \quad \phi > 0 \quad (9)$$

where  $H_j$  is the level of bureaucratic capital produced by the regulator of firm  $j$ , and  $H_a$  is the average level of bureaucratic capital owned by the other firms.

Note that if  $H_j = H_a$ , then the output is just:  $x_j = k_j$ , no matter the average level of bureaucratic capital. Although having hired a bureaucrat to increase the productivity of the firm may bring advantage from an individual point of view, it is pure waste from a social point of view.

So the profit maximization for an intermediate good firm is:

$$\text{Max } \pi_j = p_j(x_j)x_j - rk_j - qH_j \quad (10)$$

The two costs of factors of productions are (i) capital,  $k_j$  where  $r$  is the cost of real capital, and (ii) the bureaucratic capital. The last term in equation (10) is the amount paid to the regulator for his bureaucratic capital. Each year, the bureaucrat who owns bureaucratic capital of level  $H$  will “sell” it to the firm. The “price”  $q$ , for which this level of capital is purchased is endogenous. This last term is also included in the life income of the bureaucrat (equation 7).

Each firm maximizes profits by finding the optimal amount of output,  $x_j$  and bureaucratic capital,  $H_j$ . Note that equation (10) can be rewritten in the following way:

$$\text{Max } \pi_j = p_j(x_j)x_j - rx_j \left( \frac{H_j}{H_a} \right)^{-\phi} - qH_j \quad (10a)$$

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<sup>11</sup> This formulation is quite in use in models with monopolistic competition, as for instance the Neo-Keynesians models with price setting and monopolistic competition (see Blanchard and Kyotaki, 1987).

where  $p_j$  is given by equation (4). Since the business elite are monopolists who see the price of their good as negatively related to the demand, the two first-order conditions for maximizing profits are:

$$p'_j(x_j)x_j + p_j(x_j) - r\left(\frac{H_j}{H_a}\right)^{-\phi} = 0 \quad (11)$$

$$qH_a = \phi rx_j\left(\frac{H_j}{H_a}\right)^{-\phi-1} \quad (12)$$

From equation (4), we note that the demand elasticity of  $p_j(x_j)$  is equal to  $\alpha-1$ . Substituting into equation (11), and in a symmetric equilibrium all  $H_j$  are the same. Thus we get that:

$$p_j = p = \frac{1}{\alpha}r \quad (13)$$

$$H_j = H_a = \frac{\phi r K}{q A} \quad (14)$$

where the total amount of capital in the economy  $K$  is given, and

$$K = \int_0^A k_j dj .$$

Moreover, since all intermediate-goods firms sell for the same price,  $p$ , we get that:  $x_j = x$ , and  $k_j = k$ .

Equation (14) represents the demand for bureaucratic capital, as a decreasing function of  $q$  which is displayed as the D function in Figure 1, part (I).

### 3.3. The equilibrium of bureaucratic capital

From the side of the bureaucratic elite, described in section 3.1, we get the supply equation of bureaucratic capital (equation 8), and from the side of the business elite, described in section 3.2, we get the demand for bureaucratic capital (equation 14). By equating demand with supply we get the equilibrium stock of bureaucratic capital:

$$\begin{aligned} H^* &= (\tau \phi r K / A)^{1/(1+\gamma)} \\ &\text{and} \\ q^* &= \left[ \frac{(\phi r K / A)^\gamma}{\tau} \right]^{1/(1+\gamma)} \end{aligned} \quad (15)$$

This equilibrium is presented in figure 1, part(I). Some parameters are interesting to stress, and the results are quite intuitive. First, we note that when the parameter which represents the effect of regulation on the firms,  $\phi$  increases, then the level of bureaucratic capital increases. Moreover, if bureaucrats are less efficient in producing bureaucratic capital, (for instance, bureaucrats who are not good at networking), then  $\gamma$  increases, and the level of bureaucratic capital decreases. The last interesting variable is the number of years working for the firms,  $\tau$ . When  $\tau$  increases, then the level of bureaucratic capital increases.

Summarizing this section, the intertwining of the bureaucratic and business elite have led to the formation of bureaucratic capital of level  $H^*$ . The creation of this capital has permitted to the bureaucratic elite to cash in after leaving his job, and entering the business he has regulated. The intertwining between the bureaucratic and business elite is thus the consequence of the supply of bureaucratic capital by the bureaucratic elite, and its demand by the business elite.

Is this level of bureaucratic capital optimal from the point of view of the political elite? In the next sections, we show that this is not the case, but we also show that the optimal level from the point of view of the political elite is not zero. In order to do so, we define the rate of growth of the economy which is determined by the R& D sector, and we describe the behavior of the political elite.

#### 4. The R&D sector

Following Romer, (1990), the R&D sector develops new designs for new intermediate goods. The only factor that leads to growth is the increase in the number of new technologies existing. We assume that the number of new inventions is a function of the size of the labor force in the R&D sector, and also of the amount of machines already in existence,  $A$ . This assumption is the usual externality of spillover effects which leads to a “size effect” in economic growth.

Moreover, based on Mauro (1995) and La Porta et al. (1999), who have shown that the quality of government affects the performance of firms, we assume that the ability of the regulator affect the productivity of the workers and we get that the number of new inventions is:

$$\dot{A} = \delta(Q_i) L_r A \quad (16)$$

where  $\delta$  is a positive parameter function of the quality of the bureaucrat  $i$ ,  $Q_i$ ,  $\delta' > 0$  and  $\delta'' < 0$ .  $L_r$  is the size of the labor force in the R&D sector, and  $A$  the amount of

machines already in existence. In consequence we get that, in steady state, the rate of growth of the inventions,  $g$ , which is also the rate of growth of the economy, as it will be shown later on, is constant:

$$g = \frac{\dot{A}}{A} = \delta(Q_i) L, \quad (17)$$

The two elements affecting economic growth are the size of the labor force in the R&D sector, and the ability and quality of the bureaucratic elite. In the next section, we explain how the political elite appoints the bureaucratic elite.

## 5. The political elite

Models of political economy of different degrees of sophistication set, as the main goal of politicians, to be elected again, and therefore to take into account the well-being of citizen. In consequence and for matter of simplicity, I assume that the political goal of the elite is to maximize the rate of growth of the economy given by equation (17), in order to be reelected.<sup>12</sup>

One of instruments in the hand of the political elite is to determine the regulation in the economy. The political elite, i.e., the government appoints the bureaucratic elite, i.e., the regulators who regulate the monopolistic firms. Regulators are usually appointed for a given period of time, and then, new regulators succeed them.<sup>13</sup>

Candidates for the regulatory post are heterogeneous in their ability, and have also the opportunity to work in the alternative sector in which income depends on the ability of the person, as explained above. This sector comprises for example lawyers, doctors, financiers, etc.

As emphasized by Weiss (1980), when ability affects the productivity of a person, then wages are not equal for all: "workers' wage is an increasing function of his ability". Individuals with high ability and quality earn more than ones with less ability.

In consequence, without loss of generality, we assume the following form:<sup>14</sup>

<sup>12</sup> Another alternative is to assume that the political elite is benevolent. If we would have included some "political economy externalities", this would reinforce our results, and therefore, we adopt a simple formalization of the political elite.

<sup>13</sup> In some countries, the regulator can be re-appointed for one more term, so that the period will be of two consecutive terms. In this paper, we ignore this possibility, and the length of the term is known to all. In this paper, we do not raise the issue of short lived vs. long lived agents (see Spiller and Santiago, 1994).

<sup>14</sup> We are aware that there are models in which this relationship is not linear. For instance in the theory of "winners take it all". But except for the very top (which then, will not take a post in the public sector), the assumption of linearity seems reasonable. See Greenwald, (1979).

$$W_s = \xi Q_s \quad (18)$$

where  $W_s$  is the life income of an individual working in the alternative sector, and  $Q_s$  is the ability of this individual.

Since quality of the regulator affects economic growth, the political elite wants to choose the regulator with highest ability possible among the set of people in the economy who can play this role, and who can get in the alternative sector an income given by equation (18). We assume that the legislator possesses perfect knowledge of each candidate's ability.

In consequence, the political elite knows that the reservation income of the potential bureaucrat is given by (18) and therefore the choice faced by the political elite is to hire a bureaucrat with ability such that:

$$Q_i = \text{Max} \langle Q_s \mid \xi Q_s \leq V_s \rangle \quad (19)$$

and the solution is:

$$Q_i = \frac{1}{\xi} V_i \quad (20)$$

where  $V_i$  is the lifetime income of the bureaucrat  $i$ . Substituting equation (20) into equation (7) we get the relationship between ability and level of bureaucratic capital faced by the political elite and the public:

$$Q_i = \frac{1}{\xi} [\Omega - \frac{H_i^{1+\gamma}}{1+\gamma} + \tau q H_i] \quad (\text{The QH curve}) \quad (21)$$

This QH equation describes the trade-off faced by the political elite while choosing the bureaucratic elite: Appointing a regulator with higher ability means letting him accumulate a higher level of bureaucratic capital. This equation is therefore the production possibility frontier between bureaucratic capital and ability faced by the political elite. This QH equation (which is described for the equilibrium price  $q^*$ ) is depicted in figure 1, quarter (II).<sup>15</sup> The maximum amount of quality is reached at  $H=H^*$ .

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<sup>15</sup> The QH equation describes the amount of income (and therefore ability) the regulator gets for each amount of  $H$  he produces. Following, the theory of focal point and correlated equilibrium, for each amount of  $H$ , the price faced by the regulator is  $q^*$  (see Aumann, 1987).

In the next section, we develop the equilibrium rate of growth faced by the political elite.

### **III. Determination of the equilibrium and of the rate of economic growth**

In this model, the determination of the equilibrium is as in Romer, by equating wages earned by workers in both sectors: output and the R&D sector. So, we get:

$$w_r = w_y \quad (22)$$

where  $w_r$  and  $w_y$  are wages in the R&D and production sectors respectively. As previously mentioned, the total labor force working in the production and the research sectors is constant and denoted by  $\bar{L}$ .

$$L_r + L_y = \bar{L} \quad (23)$$

where  $L_r$  is the size of the labor force in the R&D sector, and  $L_y$  the labor force in the output sector.

Since the salary earned by workers in the R&D sector is the value of the patent of their invention, we have that:

$$w_r = \frac{\dot{A}}{L_r} P_r \quad (24)$$

where  $P_r$  is the price of a new-design patent, and  $\dot{A}$  is the number of new inventions developed.

Moreover, remember that:

$$w_y = (1 - \alpha) \frac{Y}{L_y} \quad (3)$$

In order to solve equation (22), following Romer and Jones, we use the relationship between profits and price of the patent. By applying the asset pricing arbitrage equation, we get that:

$$rP_r = \pi + \dot{P}_r \quad (25)$$

Since there is no increase in population, output  $Y$ , and inventions,  $A$  grow at the same rate, so that patent prices also are constant, and we get:

$$P_r = \frac{\pi}{r} \quad (26)$$

Moreover, from equations (13), (1) and (4) we get that the profit for each of the business elite, equation (10) becomes:

$$\pi = \alpha(1-\alpha) \frac{Y}{A} - qH \quad (27)$$

Equating equations (3) and (24) and substituting  $\pi$  from equation (27), and using the fact that by substituting  $x$ , output can be written in the following way (see appendix):

$$Y = A\beta L_y \quad \text{where } \beta = \frac{\alpha^{2\alpha/\alpha-1}}{r^{\alpha/\alpha-1}} \quad (28)$$

we get:

$$L_y = \frac{r}{\alpha\delta(Q)} + \frac{qH}{\alpha(1-\alpha)\beta} \quad (29)$$

and in consequence the rate of growth in the economy is:<sup>16</sup>

$$g = \delta(Q)[\bar{L} - L_y] = \delta(Q)[\bar{L} - \frac{r}{\alpha\delta(Q)} - \frac{q^*H}{\alpha(1-\alpha)\beta}] \quad (30)$$

Equation (30) describes the growth rate of the economy in all the states in which  $Q$  and  $H$  are exogenously given, and all the other variables corresponds to the first order conditions described above. In other words, equation (30) shows the rate of growth the market economy will be at, as a function of the behavior of the bureaucrat described by  $H$  and  $Q$ .

It is easy to see from equation (30) that the rate of growth in the economy is a positive function of the ability of the bureaucrats, and a negative function of the level of bureaucratic power,  $H$ . In figure 1, quarter (II), we present the iso-growth curve as a function of  $Q$  and  $H$ . The rate of substitution is positive, and given the fact that  $\delta'' < 0$ , we get that the iso-growth curves are concave.

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<sup>16</sup> Interest rate is determined on the demand side, and in a simple model equals the discount rate, and is not a function of the endogenous variables of equation (30). Therefore, for simplicity, we do not develop the demand side of goods.

On one hand, there is the economic growth determined by the market economy in terms of quality  $Q$ , and bureaucratic capital  $H$ , which is represented by the iso-growth curves, and on the other hand, there is the production possibility frontier by the bureaucrat also in terms of quality and bureaucratic capital, the  $QH$  equation. This permits us to find the optimal level of bureaucratic capital and maximal economic growth rates.

### **1. Maximum rate of growth of the market economy**

In the following proposition, we present the optimal level of bureaucratic capital for the political elite.

#### **Proposition 1**

*From the point of view of the political elite, the optimal level of bureaucratic capital is non-zero: It is in their interest to allow the bureaucratic elite to create bureaucratic capital.*

#### **Proof**

The best solution from the point of view of the political elite is given by M in figure 1. (Remember that moving towards the right is to increase economic growth). At this point, the level of  $H$  is positive.

This proposition stresses that despite the negative effects of bureaucratic capital on the economy, the political elite finds it optimal to accept it. The economy has an optimal mix of level of redundant bureaucracy and the quality of the bureaucrat. The political elite could restrict the possibility of "revolving door", but this would mean to reduce the level of the bureaucrats in the economy, which is not a good solution. In other words, this proposition stresses that a market equilibrium, which leads to the highest rate of growth, is attained when there is a creation of bureaucratic capital which is non zero. The reason for this result is that in order to hire bureaucrats of high quality, the government has to pay them higher income. The way to propose higher income is to let the bureaucrats accumulate bureaucratic capital, which will permit them to cash in, in the future.

### **2. Equilibrium of the economy**

Although point as M reaches the highest economic growth the market economy could attain, is there a way that the system will bring the economy to such a point? In the next proposition, we show that the bureaucrats will always choose an level of bureaucratic capital which is higher than the one, the political elite would prefer.

### **Proposition 2**

*The level of bureaucratic capital chosen by the bureaucratic elite is higher than the level the political elite would choose.*

#### **Proof**

The bureaucratic elite chooses to create bureaucratic capital at the level of  $H^*$ , where the derivative  $dQ/dH$  is zero, and different than the rate of substitution of the political elite. In consequence, the political elite can attain a higher level of economic growth by reducing the amount of bureaucratic capital.

This proposition stresses that the will of the bureaucrats leads to a higher level of bureaucratic capital than that favored by the political elite as shown in Proposition 1. In consequence, this model shows that the possibility of the revolving door and *pantoufle* leads the system to have bureaucrats with high ability, yet producing too much bureaucratic capital. The equilibrium is at a point wherein ability is at its maximum. The political elite would rather have less bureaucratic capital, even at the price of having less able bureaucrats.

The reason we are not at the Pareto optimum of point M in Figure 1 is due to the social waste bureaucratic capital leads to. As stressed in section 3.2, and shown in equation (9), each firm, *ceteris paribus*, still needs to invest in bureaucratic capital in order to increase profits. However, *ex-post*, this bureaucratic capital which is produced in each sector, leads to no profits and is just a pure waste from a social point of view.

### **IV. Conclusion**

Revolving door is a very frequent phenomenon, and it is difficult to believe that most of it is explained by the regulatory capture theory, in which the behavior is unlawful. Therefore, this paper presents a different view, which can explain the revolving door and also some empirical regularities related to it.

This paper has stressed the rationale of the elites' behavior, and why the revolving door from the bureaucratic elite into the business elite is so widely in use in the Western world. This paper has shown that the promiscuity between elites leads to the creation of bureaucratic capital which is good for everybody, even for the economy, although the amount of it is not optimal.

Indeed, this paper has shown that the political elite finds it optimal allowing the existence of the revolving door and the creation of bureaucratic capital. The political elite could restrict the possibility of the revolving door, but this would mean to reduce the ability of the bureaucrats in the economy, which would lead to lower economic growth. In other words, this paper has shown that the creation of bureaucratic capital is necessary in

order to get an equilibrium with higher economic growth. However, we also have shown that the level of bureaucratic capital selected is higher than the optimal level for the economy.

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**Appendix 1:** Proof of equation (28).

From equating equation(13) and (4), we get that:

$$\frac{1}{\alpha}r = \alpha L_y^{1-\alpha} x^{\alpha-1}. \quad (\text{A1})$$

Since equation (1) can be rewritten as:

$$Y = AL_y^{1-\alpha} x^\alpha. \quad (\text{A2})$$

By substituting x into equation (A1) we get:

$$x = \frac{Y\alpha^2}{Ar}. \quad (\text{A3})$$

By substituting into equation (A2) the term x from equation (A3) we get:

$$Y = A\beta L_y \quad \text{where } \beta = \frac{\alpha^{2/\alpha}}{r^{1/\alpha}} \quad (\text{28})$$

**Appendix 2:** Proof of equation (29).

From equation (22), (24), (16), (26) and (27), we get that:

$$\frac{(1-\alpha)Y}{L_y} = \frac{\delta A}{r} \left[ \frac{\alpha(1-\alpha)Y}{A} - qH \right]. \quad (\text{A4})$$

By substituting Y from equation (28), we get:

$$L_y = \frac{r}{\alpha\delta(Q)} + \frac{qH}{\alpha(1-\alpha)\beta} \quad (\text{29})$$

**Table 1.** Cases of Revolving Door from the Public Sector to the Business sector

The Elite	Government Employer	Private Sector Employer
Alan Greenspan	Chair, Fed	Paulson and Co.
Glenn Hubbard	Treasury Department	KKR Financial Co.
Robert Zoellick	State Department	Goldman Sachs
Larry Summers	Treasury Secretary	Goldman Sachs
Mark Gitenstein	Chief Counsel (Biden)	Semi-Conductor equip. and materials
Jacob Lew	Office of Management and Budget, Director	Citigroup, CEO/alt-investments
Todd Stern	Treasury Department	Wilmerhale
Madeleine Albright	White House	Albright Stonebridge Group (ASG)
Samuel Berger	NS advisor-WH	ASG
Warren Rudnam	WH	ASG
Dick Cheney	Defense Secretary	Halliburton Co.
Justin McCarthy	USTR - Assistant USTR for Congressional Affairs	Pfizer, Assistant Director of Government Relations
Billy Tauzin	U.S. Congress	PhRMA, President
Claude Burcky	USTR	Abbott Laboratories,
Sean Darragh	USTR	Biotechnology Industry Organization, PhRMA
Randall L. Tobias	White House	Eli Lilly
Michael Friedman	FDA	PhRMA Pharmacia
Donald Rumsfield	Secretary of Defense	Gilead, G. D. Searle
Mitchell Daniels Jr.	Director, Office of Management and Budget	Eli Lilly
Raymond V. Gilmartin	Bush Transition Team for the Department of Health and Human Services (DHHS)	Merck
Anne Marie Lynch	Bush Transition Team for the DHHS.	PhRMA
Bill Walters	Bush Transition Team for the DHHS	PhRMA
Dr. Harvey E. Bale, Jr	USTR	IFPMA
Susan K. Finston	State	PhRMA

Sources: Cptech.org and OpenSecrets.org.

**Figure 1.** Supply and Demand of Bureaucratic Capital, and the Trade-off between Quality and Bureaucratic Capital

