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LEGAL CONFLICTS OF INTEREST OF THE REVOLVING DOOR

Elise S. Brezis*

Abstract

This paper analyzes the conflicts of interest arising from the "revolving door". The revolving door is a common phenomenon, and it is unlikely that most of it can be explained by 'regulatory capture', a practice that is unlawful. Therefore, there is a need for a new framework.

This paper proposes a framework wherein conflicts of interest arising from the revolving door are not *unlawful*, as is in the case of regulatory capture, but still lead to economic distortions. The paper introduces a market for *bureaucratic capital*, which explains why in equilibrium, the government allows this unethical, yet not unlawful, conflict of interest to persist. Our first result is that the political elite finds it optimal to allow the existence of the revolving door, as well as the creation of bureaucratic capital. The second result is that in equilibrium, the revolving door leads to an excessive level of *bureaucratic capital*. As a consequence, the interconnection of elites and the existence of the revolving door actually lead to lower economic growth.

Keywords: elites, bureaucracy, conflicts of interest, bureaucratic capital, revolving door, economic growth

JEL classification: H10; H70; O11; O43.

*Department of Economics, Bar-Ilan University, Israel. Email: elise.brezis@biu.ac.il

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I. Introduction

State capture, and the various conflicts of interest arising from the "revolving door", have lately become subjects of intensive economic research. These phenomena have become particularly relevant after the crisis of 2008; and the possibility of a link between state capture and the financial crisis has even been raised in the literature.[1]

The "revolving door" is a common phenomenon in the United States, and is defined as heads of state agencies, after completing their bureaucratic terms, entering the very sector they have regulated. This phenomenon is also common in many developed countries.[2] Over the years, three main empirical regularities have been identified vis-a-vis the revolving door.

The first is that the waltz-like tempo, according to which prominent figures move from public-sector positions into the private sector, has become more intense over the last decade.[3] Moreover, the revolving door is not specific to the financial sector; it is widespread over many sectors of the economy, but not in a uniform way.[4]

Secondly, a firm's use of the revolving door affects its profits and stock share prices. Indeed, Luechinger and Moser (2014) showed that after the announcement of a former bureaucrat's appointment to a board of governors, there were positive abnormal returns to the firm. Goldman et al. (2009, 2013) found similar results.

Thirdly, over the last ten years, the revolving door phenomenon has been under scrutiny by organizations that combat conflicts of interest, and documentation of the interconnection between the various power elites has increased.[5] However, in most countries, the revolving door is not forbidden and is not declared unlawful, but rather is only mildly regulated via a "cooling-off" period.

The theoretical literature on the revolving door has mainly emphasized conflict of interest taking the form of *regulatory capture*, which focuses on fraud and unlawful behavior. *Regulatory capture* occurs when a former regulator is "captured" by one specific firm, and while strict with the others, she is lenient with this firm in order to be hired by it after leaving office. Note that this form of revolving door is unlawful in

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[1] See OECD (2009), and Carmen Segarra's disclosure regarding Goldman Sachs. Previous financial crises were also traced to state capture (see Fisman, 2001).

[2] See Charle (1987) and OECD (2009). In France, it has been dubbed "pantouflage" ['easing in', as one does into their house slippers], and in Japan, it is called *amakudari* ['descent from heaven'].

[3] See the list in *OpenSecrets* for the US and *Corporate-Europe* for the EU. The list of 'revolvers' cited in these websites is long, but to name just a few: Alan Greenspan, Glenn Hubbard, Robert Zoellick, Dick Cheney, Larry Summers, and Madeleine Albright.

[4] Figure 1 documents the strong inclination of US companies to hire large cohorts of revolving door personnel, especially in the financial sector, but also in the defense and pharmaceutical sectors. Moreover, Table 1 presents the data on the numbers of "revolvers" in Goldman Sachs, Citigroup, and Fannie Mae.

[5] See for instance *OpenSecrets*, *U4 Anti-Corruption Center*, *Transparency International*, and OECD (2009).

most Western countries and is perceived as pure corruption.[6] Nonetheless, it is difficult to believe that all the cases of revolving door as presented in Figure 1 and Table 1 can be explained by fraud and unlawful behavior.

This paper proposes a framework wherein conflicts of interest arising from the revolving door are not *unlawful*, as is in the case of regulatory capture, but still lead to economic distortions. Broadly, this type of conflict of interest has been coined '*abuse of power'*, and encompasses the creation of excessive regulation while in public office. As defined by Transparency International (2011), this 'abuse of power' arises when "bureaucrats abuse their power to ingratiate themselves to potential future employers".

The model developed in this paper focuses on the distortions due to the *abuse of power* that takes the general form of *over-regulation*. In other words, the bureaucrat takes actions and makes decisions while in office enabling her to cash in later when joining a firm she has regulated. While her actions can take various forms, they all incorporate what is termed the creation of *bureaucratic capital*.

The most common manifestation of bureaucratic capital is investing in good relationships with the lower-level bureaucracy, ties which will help the senior bureaucrat in the future. Bureaucratic capital also takes the form of developing excessive regulation. These are the negative effects of the revolving door stressed in this paper.

But not only has the literature cited the revolving door's negative effects; there are also positive effects thereof: The revolving door enables recruiting qualified bureaucrats. Hence, the model assumes that bureaucrats are heterogeneous in their abilities, and more able bureaucrats do a better job of regulation, so that indeed allowing the revolving door enables recruitment of high-quality bureaucratic elite.

In other words, by incorporating positive as well as negative effects of the revolving door, and those that are not *unlawful*, this model enables us to analyze the net effects of the conflicts of interest, arising from the revolving door, on economic growth. This model enables deriving two main conclusions: The first is that it is not optimal to prevent this abuse of power, and to stop the revolving door, even if it is unethical. The second is that that in equilibrium, the revolving door leads to an excessive level of bureaucratic capital, which in turn leads to over-regulation and to lower economic growth.

Moreover, these two conclusions explain the frequently observed empirical regularities noted above: why the revolving door is in wide use; why the political elite

[6] Except for Kaufmann and Vicente (2011). Note that the wrongdoing arises while the worker is employed as a regulator, and any corruption might be difficult to prove in court. The literature on regulatory capture is presented in the next section.

does not try to prevent it; and why it affects firms' market values, leading to abnormal returns for corporate appointments.

The main novelty in this model is the existence of a market for *bureaucratic capital* wherein the various players in this market are the three groups of elites which form the power elite: the bureaucratic elite, the business elite, and the political elite.[7] Bureaucratic capital is supplied by the bureaucratic elite, while the demand comes from the business elite, and the political elite appoints the bureaucrats.

Let us define more precisely the specific role of each elite, starting with the bureaucrats, who are appointed by the political elite in order to regulate the economy efficiently. Yet the bureaucrats do not merely enact efficient regulation; they also create 'bureaucratic capital' by adding rules and regulations, and by investing in good relationships with the lower-level bureaucrats. As the architect of these rules, regulations, and relationships, the regulator has insider knowledge of the system, including any loopholes that might exist.

'Bureaucratic capital' therefore enables the bureaucrat to cash in later thereon, after exiting the public sector and joining a firm in the sector she previously regulated. Thus, the bureaucrat can abuse her previous position to increase her own returns in a perfectly legal way.

The second player in this framework is the business elite, which finds the knowledge accumulated by the bureaucrat valuable. Thus, once the latter has left the civil service, she is offered a position such as joining a firm's board of directors, thereby enabling her to cash in on the *bureaucratic capital* she accumulated. In turn, this bureaucratic capital under the business elite's control enables increasing the firm's revenue.

The third player is the political elite, which appoints the bureaucrats and care about enabling the economy 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 eliminate the revolving door and to prevent the accumulation of bureaucratic capital. On the contrary, they find it optimal to allow the bureaucratic elite to create a certain amount of *bureaucratic capital*, even if doing so has some negative effects on economic growth.

The explanation behind this result is the following: Bureaucrats are heterogeneous in their abilities, and more able bureaucrats enable higher productivity and higher economic growth. In order to recruit high-quality bureaucratic elite, governments must pay them well. However, relative salaries in the public sector are not very high.

[7] The power elite was coined by Mills (1956). See the literature on the various elites in the next section.

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 create while serving as heads of agencies.

Thus, the political elite faces a tradeoff between on the one hand, having high-quality bureaucrats, and on the other hand, letting the high-quality bureaucrats create *bureaucratic capital*. The optimal solution is a non-corner one, wherein bureaucratic capital is created. This is the first result of the model.

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 while this bureaucratic capital is valuable to the firm, it is in fact a social waste.

In conclusion, by analyzing the interconnection between the three elites in power – the political, the bureaucratic, and the business elites – this paper explains the emergence of *bureaucratic capital* and its effects on economic growth. The interconnection of elites and the existence of the revolving door actually lead to lower economic growth.

The paper is divided in five parts. In Part II, we present the related literature. In part III, we present the model. In Part IV, we present the equilibrium, and Part V concludes.

II. Related literature

The literature related to this paper is mostly about the power elite and the revolving door. The economic literature on the role of the power elite -- the political, business, and bureaucratic elites – is not very extensive, and mainly centers around three topics: (i) the elite structure, (ii) the interrelations between the elite and the economy, and (iii) the interconnections within elites, which is the topic of this paper.

The elite structure refers primarily to the elite's social background, its recruitment and promotion patterns, and its geographic and ethnic origins. The recruitment analysis investigates the transparency of selection and the channels whereby such selection takes place.[8]

The economic literature on the interrelations between the elite and the rest of society devotes special attention to distributive conflicts and political institutions. The research shows that members of the elite, who have power and wealth, establish institutions that serve their own interests and exclude the masses from benefits.[9] For

[8] See Turner (1960). Some of the sociologists also explore the elite's attitude formation and behavior, coined as "positional and decision-making".

[9] See Bourguignon and Verdier (2000) and Easterly (2001).

example, one avenue of research argues that wealthy elites with enough political power to block changes will not accept adopting practices that would enhance growth, as the latter might hurt them.[10]

The third topic is the interconnections between elites, which have mainly been the focus of sociologists. This literature is divided into two main lines of thought: On the one hand are the sociologists who believe that in democracy, there is competition among the numerous types of elites, and their interconnection has no strong effect on the economy. This "pluralistic-democratic" position was espoused by sociologists such as Dahl (1957) and Parsons (1963), who argued that in Western democracy, the existence of elite groups within the power structure is not an empty fiction. Western social order is characterized by a dissociation from and distribution of power, or a 'polyarchy,' in contrast to the social order in communist countries, where all such groups are unified in the single-party system. This plurality of elites ensures competition, and that they do not form a 'power elite' separated from the 'masses.'

This school of thought further espouses the idea that democracy should a priori impose some control on the power of the ruling elite. Indeed, Schumpeter (1954) claimed that the democratic process permits "free competition among would-be leaders for the vote of the electorate" and that the masses can choose between various elites. Yet they all agree that in non-democratic polities, there is collusion between elites who have political and economic power, and who typically act on behalf of their own interests.

In contrast to the "pluralist-democratic" view, classical elite theorists such as Mosca (1939), Pareto (1935), Michels (1915), and Mills (1956) espoused the idea that despite the democratic character of a given regime -- where power is meant to reside in the *demos* (the people) -- power is in fact concentrated in the hands of a few – the oligarchy – which Mills (1956) called the "power elite".[11]

Michels has coined this view as the "iron law of oligarchy", claiming that an oligarchy is inevitable within any organization as part of the "tactical and technical necessities" of organization (Michels, 1915).[12] Consequently, there can be collusion even in democracies. Various elites may not be mutually competitive and may not control and balance each other; instead, they may be intertwined as a unanimous, cohesive power elite.[13]

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[10] See Acemoglu et al. (2011) and Rajan and Zingales (1998, 2004).

[11] A coherent synthesis of these differing views can be found in Dye et al. (2011).

[12] This view was adopted by Hunter (1959) and Domhoff (1970, 2010)) for the US, and Aaronovitch (1961) and Miliband (1969) for England.

[13] For a summary on the economic consequences of the absence of elite competition, see Brezis and Temin, (2008).

A strong interconnection among elites leads to all sectors of the economy being ruled by a single group that thinks monolithically. Two schools of thought have related a monolithic group to negative economic growth: The first claims that a monolithic group leads to the stagnation of ideas and attitudes, which in turn may prevent the adoption of technological breakthroughs (Bourdieu, 1977).[14] The second school focuses on the lack of competition in a monolithic powerful group, generating corruption, which has harmful consequences for growth.

This paper focuses on bureaucrats' quality. The economic literature on bureaucracy is voluminous and diverse. For example, there are descriptive studies on the evolution of bureaucratic institutions (see Johnson and Libecap, 1994), and on the typical profile of bureaucrats, including political affiliations, the degree of professionalism and the bureaucrats' efficiency (Rauch 1995). Numerous articles have been written on the quality of bureaucracy and on its effects on economic performance, and more specifically on economic growth (see Krueger, 1993; Shleifer and Vishny, 1993; and Mauro, 1995). La Porta et al. (1999) presented a synthesis on the various views.[15]

Regarding the revolving door, the mainstream of the economic literature has mainly emphasized conflict of interest in the form of regulatory capture, in which regulators can be induced to act in the firm's interest.[16] This literature started with the works of Stigler (1971) and Peltzman (1976) followed by Eckert (1981). Most researchers in this field have focused on the potentially undesirable effects of corruption and regulatory capture, and solutions thereto that could be implemented (Spiller, 1990; Brezis and Weiss, 1997). However, there are also studies that show that there may be positive aspects of the revolving door that should not be overlooked (Salant, 1995; Che, 1995).

An empirical literature has recently arisen that investigates the revolving door's effects on firms' performance.[17] As an indication of the strong link between political connections, the revolving door process, and corrupt practices, cross-country analyses

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[14] Brezis and Crouzet (2006) incorporated a bias à la Bourdieu, and analyzed its effect on economic growth.

[15] There is also an extensive literature on the quality of politicians. See Besley (2005), Besley et al. (2011), Mattozzi and Merlo (2008), Galasso and Nannicini (2011, 2015), de Paola and Scoppa (2011), and Kotakorpi and Poutvaara, (2011).

[16] For a review on regulatory capture see Dal Bo (2006). Lately, de Haan and Veltrop (2014) developed a model of regulatory capture based on social identity. There is also another type of state capture -- the *lobbying capture*, wherein after leaving office, the bureaucrat is hired by a lobbying firm. But this capture is not directly linked to the revolving door focusing on individuals entering a firm in the sector they have regulated (see Blanes et al., 2012).

[17] The empirical research on the revolving door focuses on both directions, i.e., from the public sector to the private sector and vice versa, while this paper focuses only on the transition from the bureaucratic elite to the business elite.

(Faccio, 2006; Faccio and Parsley, 2009) showed that the gap in economic returns between firms with and without political connections increases in highly corrupt environments. Moreover, Faccio (2010) showed that politically connected firms pay lower taxes than do other firms.

There are also differences between firms with and without state connections in the finance realm. Khwaja and Mian (2005) and Boubakri et al. (2012) showed that firms with state connections are more likely to be bailed out of financial distress.[18]

Political connections created by the revolving door increase firms' value by re-directing consumer demand in their favor. Goldman et al. (2013) showed that, following the 1994 House and Senate elections, the presence of former politicians affiliated with the winning political party on the boards of U.S companies increases the total value of awarded public procurement contracts.

In a study on Italy, Cingano and Pinotti (2013) showed that corporate appointments of local politicians do not lead to higher productivity; and Kramarz and Thesmar (2013) showed that French firms hiring directors and CEOs with former careers in the civil service, underperform. Moreover, they found that connected CEOs are better paid than their non-connected counterparts, are less likely to be fired, and are associated with lower performance.

Finally, in Russia, Slinko et al., (2005) find that politically powerful Russian firms adversely affect the performance of small or politically-powerless firms, by lobbying regulators to excessively regulate the latter, and also by diverting government spending. In contrast, they found that politically powerless firms, wherein which the firms' concentrations of political power are lower, invest more and are more productive.

In conclusion, the recent literature has shown that the revolving door erodes the tax base, reduces productivity, and lowers aggregate growth. In the next section, we present a model analyzing the revolving door's net effects on economic growth.

III. The Model

1. Introduction

This paper develops a model of the revolving door that includes both its negative and positive effects, and analyzes the interconnection between the three power elites (political, business and bureaucratic), by introducing 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

[18] In contrast, Luechinger and Moser (2014) related the value of the firm on the stock market to the timing of the revolving door. See also Fisman (2001) and Faccio et al. (2013).

equilibrium between supply and demand determines the level of bureaucratic capital. Moreover, the bureaucrats are appointed by the political elite. This new market enables explaining (i) why firms want to pay rents for hiring a previous regulator to sit on their boards, and (ii) why the political elite permits the revolving door phenomenon.

The model analyzes whether this equilibrium leads to a high rate of economic growth, which is the political elite's goal. 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, *ceteris paribus*, generates higher income for the firm, yet ultimately in equilibrium, it is a social waste.

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 of the elites' behavior.

2. Production Functions and the labor market

The economy has one main sector: the good sector. The model of this sector follows exactly the Romer (1990) model. The good sector is growing over time due to R&D.

The workers work in two sub-sectors: either in the production of the final good, or in the R&D sector, and the workers in these sub-sectors are homogeneous. There is mobility between these two sub-sectors, so that wages will be equal, and we have that:

$$L_r + L_y = \bar{L} \qquad (1)$$

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. The technical labor force, $\bar{L}$ is constant.

In this economy, there are also a small amount of individuals who have specific abilities and skills such as physicians, economists, or attorneys, and they provide services in their fields of specialization. Without any loss of generality, we assume that the measure of these individuals is zero.[19] Moreover, these 'specialists' are heterogeneous in their ability, and each of them will get a salary as a function of her ability, so that their salaries are not uniform (see Weiss, 1980). It is among this group

[19] Since this paper does not focus on questions related to relative productivity of good and service sectors, we assume that the measure of the individuals in each of these fields of skills is zero in the whole population. The number of fields of specialization is finite, therefore the whole group has a measure of zero and its aggregate income and consumption can be neglected in the market clearing conditions.

of individuals that the political elite will choose the bureaucrats who will regulate the economy.

In the labor and good markets, following Romer (1990), we assume that the final good, Y is produced with labor and intermediate goods, and the production exhibits constant returns to scale.[20] The intermediate goods x_j are produced by monopolist firms, and the factor that leads to growth is the increase in the number of new technologies, 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 increasing through savings of this population, as in Romer.

The workers can work in two sub-sectors: either in the production sector, or in 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:

$$Y = L_y^{1-\alpha} \int_0^A x_j^{\alpha} dj \qquad (2)$$

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:

$$Max\, L_y^{1-\alpha} \int_0^A x_j^{\alpha} dj - w_y L_y - \int_0^A p_j x_j dj \qquad (3)$$

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:

$$w_y = (1-\alpha)\frac{Y}{L_y} \qquad (4)$$

and

$$p_j = \alpha L_y^{1-\alpha} x_j^{\alpha-1} \qquad (5)$$

[20] Since the production functions follow Romer (1990), we therefore succinctly present the model, and more explanations on the assumptions of the model can be found in his paper.

3. The bureaucratic capital

In this section, let us present the supply of bureaucratic capital by the regulators, the demand of bureaucratic capital by the intermediate-good firms, and the equilibrium in bureaucratic capital.

3.1 The bureaucratic elite and the supply of bureaucratic capital

The bureaucratic elite is comprised of individuals who are appointed to head government agencies. This paper focuses only on top regulators, such as the governors of banks, heads of the Federal Trade Commission, the anti-trust division, the FDA, and so on. While these agency heads are of measure zero in the total population, their effect on the economy is important, and this paper will analyze their positive as well as negative effects thereon. Indeed, what does a bureaucrat do?

On one hand, she maximizes her utility, given that she was appointed to be head of a regulating agency. On the other hand, she has positive effects on the economy while regulating, which we discuss later. So, we focus now on her utility function at the time she is appointed to this position.

The novelty of our paper is that during her time in office, the regulator regulates, but at the same time, she creates *bureaucratic capital*. The bureaucratic capital are all the unnecessary regulations she is developing. Indeed, on one hand, some regulations have an important effect on the economy as a whole, for instance, changing the reserve ratio in time of recession, or blocking a medicine dangerous for human beings. On the other hand, she develops regulations and personal connections, which do not have an effect on the economy. She develops them, for only one reason: she has the knowledge on these regulations, and she has these connections. This knowledge and connections are valuable to the firms in the industry, and thus, once she has left the public service, the regulator can cash-in on this bureaucratic capital. This is the basic idea of the paper.

One unit of bureaucratic capital can be understood as one piece of regulation. The regulator decides the optimal amount of over-regulation she wants to develop, that will cost her effort, but that will permit her to get a higher income in the future. As all individuals, a regulator lives on period, but which is divided into two sub-periods. During the first sub-period, she works as a regulator, and during the second one, she works in the sector she has regulated.

During her term as a regulator, she acquires bureaucratic capital of size H, which costs her effort of size E. Since her utility function is a function of her total consumption, C and effort, E, we get that:

$$V = U(C, E) \quad \text{and} \quad \partial U / \partial C \geq 0 \quad \partial U / \partial E \leq 0 \tag{6}$$

For matters of simplicity, we may assume that the utility function is linear:

$$V = U(C, E) = C - \lambda E; \qquad \lambda > 0 \tag{7}$$

The production function of bureaucratic capital is a function of effort, and we assume that the level of bureaucratic capital is a concave function of the amount of effort invested, the same for all bureaucrats, which takes the specific form: [21]

$$H(E) = [(1+\gamma)E]^{1/1+\gamma} \qquad \gamma > 0 \tag{8}$$

Her lifetime salary when appointed as regulator is Ω. After leaving her job as regulator, the bureaucrat works in the industry that she regulated. She receives in top of her lifetime salary, a rent which is a function of the amount of "bureaucratic capital", H she has accumulated at price q.[22]

In consequence, the utility function she maximizes is:

$$V = \Omega + qH - \lambda E \tag{9}$$

Equation (9) can be rewritten as a function of the level of bureaucratic capital, by substituting E from equation (8). We get:

$$V = \Omega + qH - \lambda \frac{H^{1+\gamma}}{1+\gamma} \tag{10}$$

Taking the FOC of equation (10) with respect to H, we get the optimal level of bureaucratic power, H she wants to accumulate:

$$H = (q / \lambda)^{1/\gamma} \tag{11}$$

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[21] 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.

[22] In other words, Ω is the lifetime salary of the regulator, which includes also what she gets after retiring from being a bureaucrat. qH is the 'bonus' she gets by the company which will hire her after leaving office, for her over-regulation.

Equation (11) describes the "supply" function of bureaucratic capital by the bureaucratic elite as an increasing function of the price *q*, and which is displayed as the S function in Figure 2, part (I).

We later discuss the appointment of the bureaucrats by the political elite. We now turn to the demand for bureaucratic capital, which is determined by the firms, and the entrepreneurs who stands at the head of these firms.

3.2 The intermediate-goods firms and the demand for 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. In other words, the intermediate-goods firms consist of monopolistic firms each with its own intermediate good, and in consequence, they are regulated by regulators nominated by the political elite. The entrepreneurs maximizes profits of the regulated firms. This will permit us to develop the demand of these firms for the "knowledge" of the "revolver" regulators, i.e., the bureaucratic capital.

The output is a function of two factors of production. The first is capital, k_j. Following the 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 acquires. 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 knowledge and connections on the system. More specifically, it depends on the relative level of bureaucratic capital by the different regulators of the different firms, since it is only the relative knowledge which matters.

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

$$x_j = k_j \left(\frac{H_j}{\overline{H}}\right)^{\phi} \qquad \phi > 0 \tag{12}$$

where H_j is the level of bureaucratic capital produced by the regulator entering firm j, and $\overline{H}$ is the average level of bureaucratic capital owned by the other firms.[23]

[23] 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).

Note that if $H_j = \overline{H}$, 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:

$$Max\,\pi_j = p_j(x_j)x_j - rk_j - qH_j \qquad (13)$$

The two costs of factors of productions are (i) capital, k_j where r is the interest rate, and (ii) the bureaucratic capital at cost q. The last term in equation (13) is the amount paid to the regulator for her bureaucratic capital. Indeed, the bureaucrat who owns bureaucratic capital of level H will "sell" it to the firm, at price q, which is endogenously determined by supply and demand.

Each firm maximizes profits by finding the optimal amount of output, x_j and bureaucratic capital, H_j. Note that equation (13) can be rewritten in the following way:

$$Max\,\pi_j = p_j(x_j)x_j - rx_j(\frac{H_j}{\overline{H}})^{-\phi} - qH_j \qquad (14)$$

where p_j is given by equation (5). Since the business elite is composed of monopolists who see the price of their good as negatively related to the demand, the two first-order conditions for maximizing profits are:

$$p'_j(x_j)x_j + p_j(x_j) - r(\frac{H_j}{\overline{H}})^{-\phi} = 0 \qquad (15)$$

$$q\overline{H} = \phi\, r x_j(\frac{H_j}{\overline{H}})^{-\phi-1} \qquad (16)$$

From equation (5), we note that the demand elasticity of $p_j(x_j)$ is equal to α-1. Substituting into equation (15), and in a symmetric equilibrium all H_j are the same. Thus we get that:

$$p_j = p = \frac{1}{\alpha}r \qquad (17)$$

$$H_j = \overline{H} = \frac{\phi r K}{qA} \qquad (18)$$

where the total amount of capital in the economy K is:

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

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

Equation (18) represents the demand for bureaucratic capital, as a decreasing function of *q*, which is displayed as the D function in Figure 2, 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 11), and from the side of the business elite, described in section 3.2, we get the demand for bureaucratic capital (equation 18). By equating demand with supply we get the equilibrium stock of bureaucratic capital:

$$H^* = (\phi r K / \lambda A)^{1/1+\gamma}$$
$$\text{and} \qquad (19)$$
$$q^* = [\lambda(\phi r K / A)^{\gamma}]^{1/1+\gamma}$$

This equilibrium is presented in Figure 2, part(I). First, we note that when the parameter which represents the effect of regulation on the firms, ϕ increases, then the level of bureaucratic capital increases. Moreover, if bureaucrats are less efficient in producing bureaucratic capital, then γ increases, and the level of bureaucratic capital decreases. The last interesting variable is *K*/*A*; we discuss it below, when we show that, in a balanced growth path, it is constant.

Summarizing this section, the intertwining of the bureaucratic and business elites has led to the formation of bureaucratic capital of level H*. The creation of this capital has allowed the bureaucratic elite to cash in on their bureaucratic capital stock after leaving their public-sector regulator positions, and enter the very businesses they once regulated. The intertwining of the bureaucratic and business elites is thus the consequence of the supply of bureaucratic capital by the bureaucratic elite, and the demand by the business elite. In other words, the revolving door allows the creation of bureaucratic capital, that is legal and not unlawful.

Is this level of bureaucratic capital optimal from the standpoint of the political elite? In the following sections we show that it is not, but we also show that the optimal bureaucratic capital level from the standpoint of the political elite is not zero.

In order to do so, we define the rate of growth of the economy that is determined by the R& D sector, and we describe the political elite's behavior.

4. The rate of growth in the economy

4.1 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 affects the productivity of the workers in the R&D sector and we get that the number of new inventions is:

$$\dot{A} = \delta(Q) L_r A \qquad (20)$$

where δ is a positive parameter function of the quality of the bureaucrat, Q, $\delta' \geq 0$ 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, is constant since we focus only on the balanced growth path:

$$g = \frac{\dot{A}}{A} = \delta(Q) L_r \qquad (21)$$

Indeed, as in Romer, and in many of the basic models of economic growth, the focus is on the balance growth path, in which, capital, output, innovations and consumption all grow at a constant rate, g defined by (21).[24] So we have that K/A and Y/A are constant.

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.

[24] We do not discuss growth rates in transition path. Moreover since this paper does not put the focus on savings and consumption, we follow Romer's equation (2) for capital accumulation.

4.2. The Political elite and the quality of the bureaucratic elite

For matter of simplicity, this paper assumes that the goal of the political elite is to maximize the rate of growth of the economy given by equation (21), and this in order to be reelected.[25]

One instrument in the hand of the political elite is to appoint the bureaucratic elite, i.e., the regulators who regulate the monopolistic firms. As emphasized above, regulators are chosen among the individuals with specific abilities and skills. These individuals are heterogeneous in their abilities, and 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:[26]

$$W_s = \xi Q_s \tag{22}$$

where W_s is the income of a specific individual, and Q_s is the ability of this individual.

Since quality of the regulator affects economic growth (equation 21), the political elite will choose a regulator with the highest ability possible and who gets an income related to quality given by equation (22). 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 (22) and therefore the choice faced by the political elite is to hire a bureaucrat with ability such that:

$$Q_i = Max\left\langle Q_s \,\middle|\, \xi Q_s \le V_s \right\rangle \tag{23}$$

and the solution is:

$$Q_i = \frac{1}{\xi} V_i \tag{24}$$

[25] 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.

[26] 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).

where V_i is the lifetime income of the bureaucrat *i*. Substituting equation (10) into equation (24), we get the relationship between ability and level of bureaucratic capital faced by the political elite:

$$Q_i = \frac{1}{\xi}[\Omega - \lambda \frac{H_i^{1+\gamma}}{1+\gamma} + qH_i] \quad \text{(The QH curve)} \tag{25}$$

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 her accumulate a higher level of bureaucratic capital. This equation is therefore the production possibility frontier between bureaucratic capital and quality faced by the political elite. This QH equation (which is described for the equilibrium price q*) is depicted in Figure 2, quarter (II).[27] The maximum amount of quality is reached at H=H*.

It should be added that this result is quite intuitive: If the political elite wants to hire a high-quality bureaucrat, her income has to be high. Since wages in the public sector are lower than the reservation wage of the bureaucrat, they have to let her invest and accumulate bureaucratic capital so that she will be indifferent between being a bureaucrat or providing private services as lawyer or economist. The political elite will get a high quality bureaucrat subject to equation (25): a higher quality means a higher amount of bureaucratic capital.

We are left with the question, which bundle of quality and bureaucratic capital will the political elite chose. In the next section, we develop the equilibrium rate of growth chosen by the political elite.

IV. Determination of the equilibrium and of the rate of economic growth

As in Romer, the equilibrium is obtained by equating wages earned by workers in the output and the R&D sectors.[28] So, we have:

$$w_r = w_y \tag{26}$$

[27] 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).

[28] We assume that the providers of services consume only services, so they have no influence on the good sector and its rate of growth.

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 $\bar{L}$.

$$L_r + L_y = \bar{L} \tag{1}$$

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:

$$w_r = \frac{\dot{A}}{L_r} P_r \tag{27}$$

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

Moreover, remember that:

$$w_y = (1-\alpha)\frac{Y}{L_y} \tag{4}$$

In order to solve equation (26), following Romer, we apply the asset pricing arbitrage equation, so that:[29]

$$rP_r = \pi + \dot{P}_r \tag{28}$$

where $\dot{P}_r$ is the change in the price of patents and π are profits. Since there is no increase in population, along the balanced growth path, output *Y*, and inventions, *A* grow at the same rate, so that patent prices also are constant, and we get:

$$P_r = \frac{\pi}{r} \tag{29}$$

Moreover, from equations (17), (2) and (5) we obtain that the profit for each of the firms is:

[29] "This equation says that at every point in time, the net revenue must be sufficient to cover the interest cost. (This formulation is taken from Grossman and Helpman)" (Romer, 1990, p. 87)

$$\pi = \alpha(1-\alpha)\frac{Y}{A} - qH \tag{30}$$

Equating equations (4) and (27) and substituting π from equation (30), output can be written in the following way (see the appendix):

$$Y = A\tau L_y \quad where\ \tau = (\frac{\alpha^2}{r})^{\alpha/1-\alpha} \tag{31}$$

Since from equations (20), (26), (27), (29) and (30), we get that:

$$\frac{(1-\alpha)Y}{L_y} = \frac{\delta A}{r}[\frac{\alpha(1-\alpha)Y}{A} - q^* H]$$

Then we obtain: [30]

$$L_y = \frac{r}{\alpha\delta(Q)} + \frac{q^* H}{\alpha(1-\alpha)\tau} \tag{32}$$

In consequence the rate of growth in the economy is:

$$g = \delta(Q)[\bar{L} - L_y] = \delta(Q)[\bar{L} - \frac{r}{\alpha\delta(Q)} - \frac{q^* H}{\alpha(1-\alpha)\tau}] \tag{33}$$

Equation (33) describes the rate of growth of the market economy as a function of the behavior of the bureaucrat described by H and Q. It should be noted that the rate of growth in the economy is a positive function of the ability of the bureaucrat, Q, and a negative function of the level of bureaucratic capital, H. In Figure 2, 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.

The two main equations of this model are equations (25) and (33). Equation (25), the QH function, describes the production possibility frontier faced by the political elite in terms of quality and bureaucratic capital. Equation (33) depicts the will of the political elite: For each Q and H chosen by the bureaucrat, what is the level of growth rate obtained in the economy.

In consequence, these two equations determine the rate of growth, and the level of bureaucratic capital. We now determine what is the amount of bureaucratic capital which leads to the highest rate of growth.

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[30] Interest rate is determined by the demand of goods, as in Romer (p. 88), and is not a function of the endogenous variables of equation (33).

1. Maximum rate of growth of the market economy

In the following proposition, we present the optimal level of bureaucratic capital from the point of view of 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

Equation (33) is represented by the iso-growth curves in Figure 2. As we move further to the right, an iso-growth curve depicts a higher growth rate. In consequence, the highest rate of growth which is also on the production possibility frontier is point M. This is the optimal solution from the point of view of the political elite. At this point, the level of H is positive, and non-zero.

This proposition stresses that despite the negative effects of bureaucratic capital on the economy, the economy has an optimal mix of level of redundant bureaucracy and quality of the bureaucrat. While the political elite could restrict the possibility of the revolving door, this would mean reducing the quality level of the bureaucrats in the economy, which is not a good solution. In other words, this proposition states that the highest rate of growth is attained when there is 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 salaries. The way to induce higher income is to let the bureaucrats accumulate bureaucratic capital, which will enable them to "cash in" in the future.

2. Equilibrium of the economy

Although the market economy reaches its highest economic growth at point M, we now show that the bureaucrats will choose a 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*, which gives her the highest utility. Therefore in a market equilibrium, the bureaucrats chose the amount of H*, and the economy will be at point F. Comparing F to M, we obtain that at F, the amount of bureaucratic capital is higher, and the rate of growth is lower.

This proposition stresses that the amount of bureaucratic capital chosen by the bureaucrats (and the business elite), H* is higher than that favored by the political elite described in Proposition 1. In consequence, the political elite can attain a higher level of economic growth by reducing the amount of bureaucratic capital.

This model underlines that the revolving door 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 2 is due to the social waste bureaucratic capital leads to. As stressed in section 3.2, and shown in equation (12), each firm, *ceteris paribus*, still needs to invest in bureaucratic capital in order to increase profits. However, ex-post, this bureaucratic capital leads to no profits and is just a pure waste from a social point of view.

3. A numerical example

Since equations (25) and (33) are presented in Figure 2 as implicit functions, we present a numerical example for these two equations, in order to highlight the results of the two propositions.

We assume the following parameters, to make the calculation easier to follow:

$$\gamma = 1; \lambda = .4; r = .04; \alpha = .5; K / A = 10; \Omega = 1.9; \qquad (34)$$
$$\phi = 1; \xi = 1 \; and \; \delta(Q) = Q$$

In consequence the QH equation (25) becomes:

$$Q = 1.9 + .4H - .2H^2 \qquad (35)$$

And the growth equation (33) becomes:

$$Q = (g + .08)/(6 - .27H) \qquad (36)$$

We get the following results:
At point M (optimal for the political elite), we have: H= .76; Q=2.08 and g=12.02.
At point F (optimal for the bureaucrats), we have: H*= 1; Q=2.1 and g=11.95.

In consequence, we obtain that at the maximum growth rate (point M), the amount of H is not zero, which is the message of proposition 1. We also get that at F, the growth rate is lower, and the amount of H chosen by the bureaucrats is higher than the optimal one (proposition 2).

V. Conclusion

The "revolving door" is a common phenomenon, and it is unlikely that most of it can be explained by 'regulatory capture', a practice that is unlawful. Therefore, there is a need for a new framework.

The purpose of this paper is to present a simple framework that incorporates the main elements affecting decisions related to the revolving door. Moreover, the paper proposes a new structure that integrates the bureaucratic and political elite in the Romer endogenous growth model.

This paper has shown that the political elite finds it optimal to allow the existence of the revolving door and the consequent creation of *bureaucratic capital*. While the political elite could restrict the possibility of the revolving door, it would mean lowering the quality 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 attain equilibrium with higher economic growth. However, we also show that the level of bureaucratic capital selected is higher than the *optimal* level for the economy: The interconnection of elites and the creation of too much bureaucratic capital lead to lower economic growth than the optimal one. So, this paper provides a new theoretical framework enabling analysis of the revolving door issue without assuming that bureaucrats are innately corrupt.

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Table 1. The revolving door in three major US financial firms

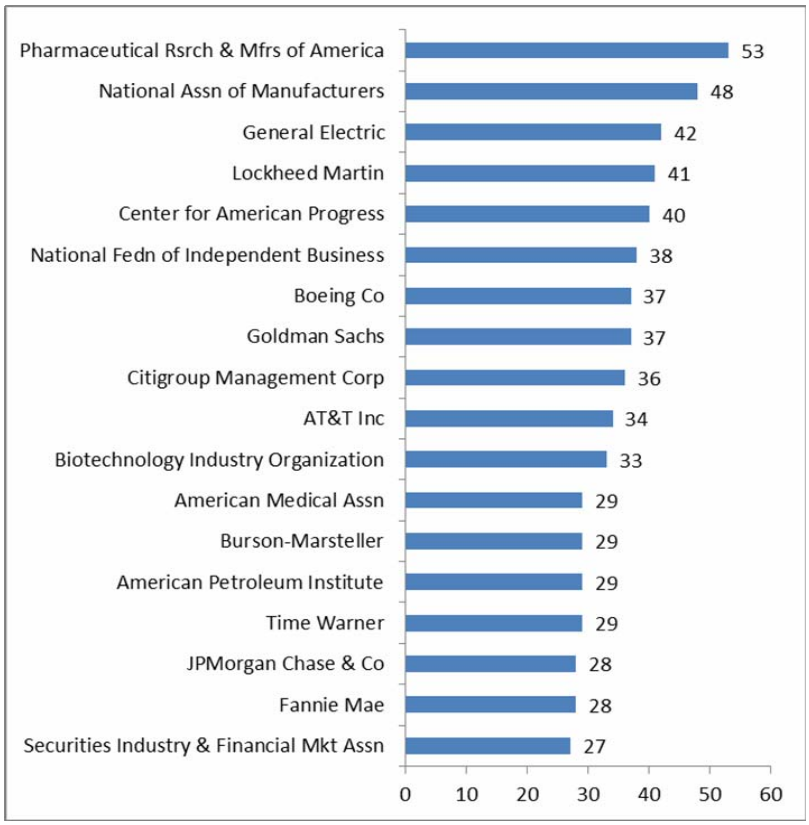
Revolving door flow	Number of revolved regulators by category		
	Total	**P**	**NP**
Goldman Sachs (GS)			
1. Public to GS	19 (5)	5 (1)	14 (4)
2. GS to Public	12 (3)	10 (2)	2 (1)
3. GS to Public to GS	6 (1)	4 (0)	2 (1)
Total	37 (9)	19 (3)	18 (6)
Citigroup (CG)			
1. Public to CG	20 (10)	3 (0)	17 (10)
2. CG to Public	1 (0)	0 (0)	1 (0)
3. CG to Public to CG	5 (2)	4 (2)	1 (0)
Total	26 (12)	7 (2)	19 (10)
Fannie Mae (FM)			
1. Public to FM	11 (6)	2 (1)	9 (5)
2. FM to Public	3 (2)	0 (0)	3 (2)
3. FM to Public to FM	12 (4)	6 (3)	6 (1)
Total	25 (12)	8 (4)	17 (8)

Notes: a. The revolving door flows are divided into three types: *Type 1, public-to-private:* Former members of administration who currently hold an executive position in a regulated company. *Type 2, private-to-public:* Former executives of a regulated company who are currently members of a relevant administration. *Type 3, private-to-public-to-private (two-sided):* Executives who have engaged in both type 1 and type 2 movements. In parenthesis is the number of female revolved regulators.

b. For the purposes of calculation, these regulators are sorted according to their position in the private sector. They are classified into two categories. Powerful revolved regulators (*category P*) are top-level government officials and legislators. Non-powerful revolved regulators (*category NP*) are individuals with lower-level positions in the government or in a relevant administration.

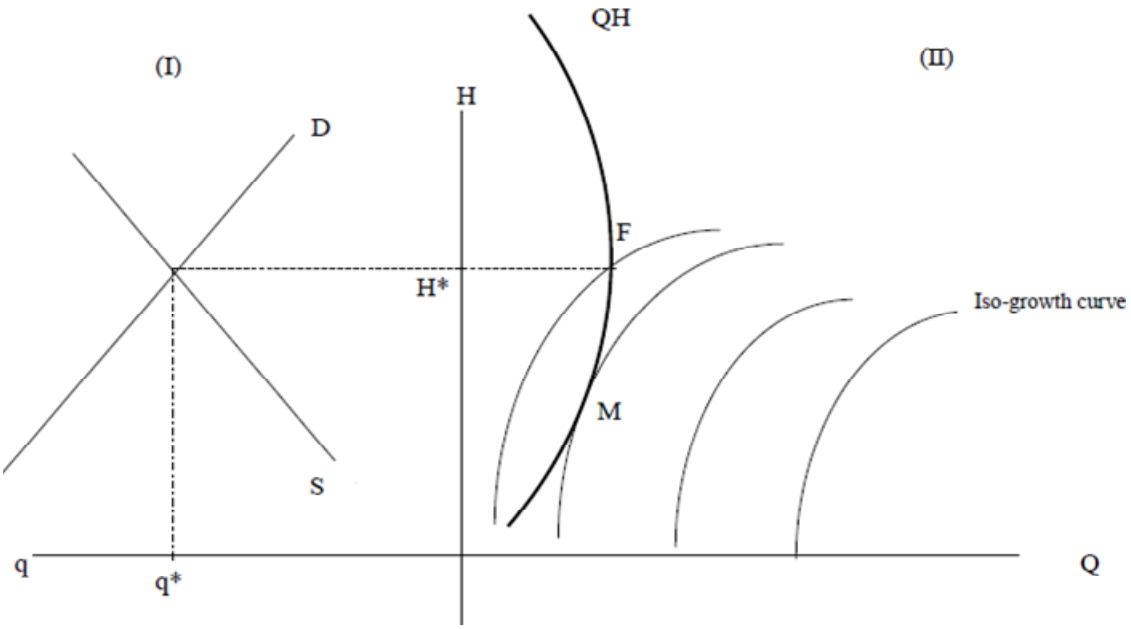
Source: Data collected by the author from official company websites, LexisNexis Academic, OneSource (Avention), and business websites in 2014. I thank Gina Li for excellent research assistance.

Figure 1. Top revolving door employers in the US.



Source: See website https://www.opensecrets.org/revolving/.

Figure 2. Supply and Demand of Bureaucratic Capital, and the Trade-off between Quality and Bureaucratic Capital



Appendix: Proof of equation (31).

From equating equation(17) and (5), we get that:

$$\frac{1}{\alpha} r = \alpha L_y^{1-\alpha} x^{\alpha-1} . \tag{A1}$$

Since equation (2) can be rewritten as:

$$Y = A L_y^{1-\alpha} x^{\alpha} . \tag{A2}$$

By substituting x into equation (A1) we get:

$$x = \frac{Y\alpha^2}{Ar} . \tag{A3}$$

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

$$Y = A\tau L_y \quad where\ \tau = \left(\frac{\alpha^2}{r}\right)^{\alpha/1-\alpha} \tag{31}$$