The Coastal Business Journal

Volume 1 | Number 1 Article 5

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INTRODUCTION & SCOPE OF PROJECT

Official corruption, unfortunately, is endemic in the developing world. One factor in the spread of this illegal activity has been the propensity of developing-country governments to intervene heavily in their economies, often in the attempt to guide, direct, and control economic activity in order to promote the desired pace and style of economic development. Such regulatory efforts, though now on the wane in much of the developing world, continue to generate opportunities in many countries for bureaucrats in control of scarce resources to allocate them on a non-market basis, to further their own economic, political, and social prospects.

Such official corruption often, in our observation, exists side-by-side with long-term economic stagnation: on the basis of "casual empiricism," we note that the extent of official corruption in an economy is positively correlated with government regulatory activity, and negatively correlated with the pace of long-run economic growth and development. But correlation does not guarantee causation: corruption might be a factor contributing to a country's economic stagnation; on the other hand, in the presence of long-run economic decline the incentive to engage in corrupt activities might well increase, and thus the causation may run from economic stagnation to corruption. Furthermore, the extent to which corruption has a statistically significant effect on long-run economic growth is unclear. In sum, these correlations (and the underlying causal relationships) are the subject of much debate in the profession. We do not enter this debate here. We seek only to begin developing some of the possible short-run and long-run macroeconomic consequences of official corruption, which may generate "Directly Unproductive Activity" (DUP activity) elsewhere in the economy--to use the phrase coined by Jagdish Bhagwati.

The purpose of our research, more specifically, is to construct a model of an economy that illuminates some of the current and future economic influences associated with official corruption, in a way that enables the analyst to examine the consequences of policy reforms aimed at reducing or eliminating that corruption. A framework that is eminently suitable for our purposes - given that governmental regulation of economic activity often results in (among other things) officially-fixed prices of key items in the economy (e.g., formal-sector wage rates, nominal interest rates, the nominal exchange rate)—is that of "disequilibrium macroeconomics" (or, "non-Walrasian macroeconomics"). This framework, pioneered by, e.g. Clower (1965) and Barro and Grossman (1971 and 1976) and Jean-Pascal Bernassy (1982, 1986), seeks to highlight the implications of economic activity that takes place at non-market-clearing prices. We follow this modeling tradition -

and its extensions to a two-period economy, as done in, e.g.. Neary and Stiglitz (1983), Cuddington and Vinals (1986a, 1986b), and Smith II (I989) - in our attempt to model formally the optimization problems of the various types of agents who inhabit our highly regulated economy.

In the concluding section, we comment briefly on the problem of nepotism within the private sector, and on some strategies for how to mitigate the resulting inefficiency.

The economy we construct has the fol1oving characteristics:

1. Two "groups" of people inhabit this country: group g and group h. The initial distribution of intelligence, education, talents, and abilities across the two groups are identical. If one individual from each group was selected at random, therefore, the two individuals would, on average, exhibit the same level of productivity in the workplace.
2. Groups g and h, however, are easily distinguishable from each other on the basis of some personal characteristic - visibly evident, but irrelevant from a productivity perspective. This personal characteristic could be skin color, religion, ethnicity, region of birth, etc.
3. Members of group g are initially in the government, serving as public officials, employed in the (urban-based) "formal sector," or unemployed. Members of group h are initially in the private sector--either in agriculture, the (urban-based) "informal sector," or unemployed.
4. Formal-sector economic activity is heavily regulated by the government, in accord with the official "development strategy" being pursued by the country. Wages in formal-sector employment, for example, are set by the government and not by the market.
5. The type and pace of what Kuznets and others have termed "modern economic growth" in this country (as determined by government policy) has not been sufficient to absorb the increase in the urban-based labor force (driven primarily by rural-urban migration). At the policy-determined formal-sector real wage, therefore, there exists an initial excess demand for urban, formal-sector jobs.
6. This initial excess demand thus presents an opportunity to the government bureaucrats who are in charge of economic policy: in the course of regulating access to scarce formal- sector jobs, these officials have an incentive to extract rents from job-seekers.
7. These government officials, however, must share the rents they extract by regulating access to formal-sector employment with fellow members of group g who occupy higher positions in the government. Let this take the form of a 'kickback' to the higher government officials - consisting of a given percentage of the bureaucrat's salary - that must be paid to enable the bureaucrat to keep his/her job.

Suppose that the government officials Who control access to formal-sector employment – all of whom are members of group g – choose to ration the scarce formal-sector jobs across the

growing pool of urban job-seekers on a non-market basis, by rewarding fellow members of group g with jobs while denying employment to all members of group h. Several short-run results follow:

1. Employment is granted to members of g regardless of their productivity, which is a source of short-run allocative inefficiency in the economy.
2. Members of group h, regardless of their productivity, are denied access to formal-sector jobs and are thus forced into the urban informal sector - where they may or may not find work in accord with their skills and abilities. This is an additional source of short-run allocative inefficiency in the economy.
3. The economy is therefore bifurcated along ethnic lines: members of g remain in the government and occupy the well-paying formal sector jobs, whereas members of b are forced, due to an irrelevant personal characteristic, into a choice between continued unemployment, life in the urban informal sector, or a return to rural areas.
4. In macroeconomic terms, this allocative inefficiency will result in a decline in the country's level of Potential Real GDP. In the short run, however, the country's Production Possibilities Curve (PPC) does not shift: "production possibilities" in this economy remain intact, if all resources are in fact used fully and efficiently. The gap between Potential Real GDP and the PPC thus widens in the short run, and the economy experiences a deadweight loss of economic welfare due to the corruption.

In the long run, however, the country's production possibilities do decline - if this corrupt activity continues. Members of group h, relegated to rural or informal-sector employment in the short run, are likely to expend resources in order to gain access to the formal-sector jobs that were initially reserved for members of group g. Resources in the economy thus get diverted from productive use to this DUP activity, and the effective "resource base" of the economy declines. Thus we obtain the familiar result of DUP activity: a shrinkage of the economy's PPC in the long run.

Suppose now that the members of group g who control access to formal-sector employment modify their "rationing rule" over time, in response to a change in government policy. Specifically, suppose that the government decides that, in order to retain political legitimacy in the face of its monopoly over power, it must open up formal-sector employment to members of group h. Thus the group-**g** bureaucrats in charge of employment in the formal sector receive orders to permit members of both groups to obtain these jobs. This modification, of course, presents yet another opportunity for the group-g bureaucrats, which we assume they seize: these bureaucrats eventually do allow members of group h to obtain formal-sector jobs *for a price.* In practice, therefore, access to formal-sector employment thus becomes reserved for members of group g and those members of group h who can afford financially to bribe the necessary government bureaucrats.

The modification of the rationing role might look very much like the triumph of the market mechanism, as jobs in the formal sector start being rationed according to ability on the job in question (i.e., in accord with productivity), but rather on the basis of a visible "screening device" (ethnicity for members of g, money for members of h) that may or may not be correlated with productivity on the job in the formal sector.

Indeed, it may well be the case that those members of group h who are willing to pay the most for access to formal-sector employment are precisely those with the fewest relevant skills and abilities. If members of group h are willing to pay up to the difference between what they would earn on the job in the formal sector and what they were earning in the informal sector, then those with the *lowest* "reservation wage' would offer the *most* money to the government bureaucrats. If we assume that in the long run earnings in the informal sector follow productivity, then we may observe "adverse selection**"** among group-h job-seekers: the willingness to pay for access to the formal sector may well be an indicator of the applicants *lack of fitness* for the jobs in question.

In the long run, therefore, despite the opening-up of the formal sector to members of both groups of people, the allocative inefficiency present in the short run may *not* be eliminated--or even reduced. Indeed, the extent of inefficiency could rise, given the adverse selection problem discussed above. Potential Real GDP in the economy would therefore continue to fall in the long run, along with production possibilities. Long-run economic stagnation would become a reality.

As we develop this analysis, we anticipate proceeding in several different directions. First, we have thought about enriching our model by incorporating additional possibilities for non-market rationing on the part of bureaucrats. In the presence of an excess demand for credit (due to, e.g., the official control of nominal interest rates in an inflationary environment), bureaucrats might well choose to ration credit in order to better their own prospects: those willing to pay for the credit can obtain it, whereas those who aren't, don't. By incorporating a link between credit and production (i.e., by following the "credit-as-working capital" approach employed in, e.g., Smith II(1989)) we can then analyze explicitly the effect on production and income of changes in this rationing rule (e.g., one implemented under pressure from an external source of finance - the IMF?), or a change in the government-specified level of nominal interest rates (again, possibly in response to external pressure from the IMF). In addition, it is possible to incorporate an explicit market for goods and services into this framework, which would enable us to analyze bureaucratic corruption in a world characterized by individuals seeking to obtain scarce goods, credit, and jobs.

But our goal is not just to illuminate possibilities. We hope to develop our analysis to the extent that we can use our framework to study problems of policy reform in an economy in which official corruption is endemic. Many times over the past two decades, we are sure, the IMF and the World Bank have been called in to impose a "structural adjustment" plan in an economy characterized by an excess demand for goods. an excess supply of labor, economic stagnation. and official corruption. We hope that our research effort will contribute to the analysis of policy reforms undertaken in these real-world circumstances.

In what follows we sketch out our first formal attempt at characterizing the behavior of the principals in this economy. A more complete model that enables us to pursue our stated goals will require much more work. We appreciate any comments. criticism. and feedback that can help us develop this model more explicitly and completely.

A MODEL OF CORRUPT BEHAVIOR BY A PUBLIC OFFICIAL

Let us assume:

i) All individuals have identical utility functions.
ii) All individuals have equal capabilities but skills and training may be unequal.
iii) The public official maximizes his utility (function) which depends on his money and psychic incomes.
iv) The official derives psychic income by practicing nepotism, and additional money income by practicing corruption.
v) We assume people belonging to two groups: g and h. The official in this model belongs to group g.

The official's utility function is given by: $U = U\{Y_m Y_s\}$

Where: Y_m is money income, and Y_s is psychic income.

For a corrupt official: $Y_m = Y_e + Y^r_b - Y^p_b$

Where: Y_e is earned income/his salary
Y^r_b is income received through bribes
Y^p_b is income lost through paying bribes

And assuming Y_e is constant, and $Y^r_b = P_g W_g + P_h W_h$

Where: P_g is illegal price charged to members of group g per unit of "favor",
P_h is illegal price charged to members of group h per unit of "favor",

and: W_g is total units of "favor" done to members of group g; and,
W_h is total units of "favor" done to members of group h.

And assuming: $Y^p_b = kY^r_b$ Where $0 \leq k \leq 1$

$$Y_m = Y_e + Y^r_b - kY^r_b$$
$$= Y_e + (1-k)(P_g W_g + P_h W_h)$$

Further assume: $Y_s = \phi(W_g, W_h)$

Now the official will maximize:

$$U = U\{Y_e + (1-k)(P_gW_g + P_hW_h),\ W_g, W_h\}$$

$$\delta_u/\delta W_g = (1-k)P_g + U'_{wg} = 0$$

$$\delta_u/\delta W_h = (1-k)P_h + U'_{wh} = 0$$

Equating the marginal utilities derived from doing an extra unit of "favor" to the members of the groups g and h, i.e.,

$$\delta_u/\delta_{wg} = \delta_u/\delta_{wh}$$

we get: $P_h = 1/(1-k)(U'_{wg} - U'_{wh}) + P_g$

Here U'_{wg} is marginal utility from psychic income the official derives by doing an additional unit of "favor" to members of group g; and since he belongs to this group we assume:

$$U'_{wg} \geq 0$$

Similarly U'_{wh} is marginal utility from psychic income associated with an additional unit of "favor" to members of group h; and since the official does not belong to this group, we assume:

$$U'_{wh} \leq 0$$

Thus: $P_h \geq P_g$

So he is likely to charge a higher price to members of group "h" as compared to group "g". i.e., nepotism.

If $P_h = P_g > 0$, he is not discriminating between groups g and h, i.e., he is not practicing nepotism. But as long as P_h and/or P_g is greater than zero he is practicing corruption.

When $P_h > P_g \geq 0$, the official is both corrupt and nepotic.

Another way to look at it is:

$P_h > 0$ or $P_g > 0$:	corruption
$U'_{wg} > 0$:	nepotism
$U'_{wh} < 0$:	hatred/malice

$\therefore$ This model is amenable for further analysis under different assumptions.

CONCLUDING THOUGHTS: NEPOTISM AND THE PRIVATE SECTOR

The preceding discussion focused on official corruption and its negative impact on the allocation of scarce resources, and hence on the deadweight loss to society resulting from this activity. The problem of inefficiency we highlight is generally viewed as confined to, or only important in, the public sector: however, another source of inefficiency could he nepotism within the private sector. Obviously, this problem arises more with small businesses and particularly in a family business. Nepotism is "favoritism shown to a relative based on the basis of relationship rather than performance" (Schneider, 1998). Consultants point to a large number of issues when nepotism occurs. Besides entry into the business what are the roles and responsibilities of the individual after (s)he enters the business? What actions are to be taken if the performance of the relative is not adequate? Lastly, conflict can he expected when family members and non-family workers arc not treated equally.

How can one reduce the potential problems associated with hiring family members? Aronoff and Ward (1993) suggest three standards:

1. The person must have an appropriate education for the position available;
2. The person should have three to five years of prior experience outside the familv business;
3. Entry should be into an existing and necessary job that has clear precedents for pay and advancement.

Aronoff and Ward (1993) give additional guidelines and raise other questions beyond the scope of this paper. However, if there is one point that all experts agree upon, it is the need for communication within the family and within the business. Rules and expectations must be effectively disseminated to everyone so as to reduce conflicts that turn attention from the firm's profit-seeking activities.

Thus, while we have focused in the body of this paper on how public-sector corruption and nepotism generate economy-wide inefficiencies, one cannot ignore the same problems associated with the private sector. This is increasingly true as small businesses are becoming more important in the domestic marketplace as well as in the global economy.

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