



[695] Paper

Geographical spread of corruption

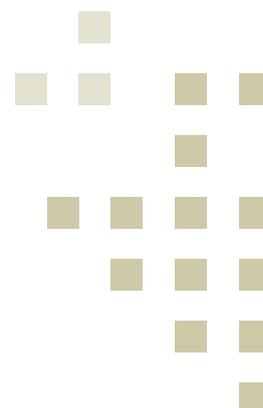
Policies, institutions and cross-country economic interaction. Part I: Issues, theory

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Policies, institutions and cross-country economic interaction. Part I: Issues, theory

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[Abstract] The international aspects of corruption have received considerable attention in both research and policy: What determines whether a country is highly corrupt or not? Most research has sought to answer this question by considering each country as reflecting the same kind of mechanism explaining both the high and low outcomes. In this paper some of the theoretical explanations suggested in the literature are reviewed at the same time as it suggests how the question needs to be rephrased if each country's corruption rate is influenced by an internationally open economic system.

Geographical spread of corruption. Policies, institutions and cross-country economic interaction. Part I: Issues, theory

1. Introduction

In this paper I will make a critical survey of some of the research that has taken place recently which relates corruption and cross-border economic interaction: international trade, capital and migration movements. While it is motivated by a number of intriguing results reached by the empirical, econometric research of the field, I will here focus on theory and major policy issues. This is partly based on a conviction that much of this research has become so inspired by the many new and interesting datasets that have become accessible in the field that many have jumped into the sea of new data without ensuring that they possess the necessary depth to safely carry such dives. In a second paper the relevant empirical literature will be discussed more directly. The surveys are the first step in a research project that is dealing with the geographical distribution of governance indicators and the cross-border intensities of economic interaction.

Corruption has become an important policy concern in an increasing number of countries. It has moved into many national policy agendas. Nevertheless, the recent upsurge in the policy concern that has taken place since the early 1990s arose in connection to activities in international organizations. Corruption has to a large extent also remained an international issue, although most corruption, of course, arises in internationally immobile, national public organizations. Hence an underlying critical policy issue has been whether changes in the international institutional architecture and policies may reduce both cross-border corruption and corruption in the single country.

During the same period a strong policy thrust towards the dismantling of policy barriers against international trade and capital movement has made its impression on

the political order. One of the arguments for the resulting change in the international institutional architecture and economic policies towards increased international economic openness, is that it should also cause corruption to decrease. Cross-country econometric studies (most strongly expressed in Bonaglia et al, 2001) appear to confirm that for the single country more openness will imply less corruption. Nevertheless, it is also widely believed that the overall incidence of corruption globally has significantly increased during the period of increasing economic openness. This is a major policy paradox in the present international *policy* debate about corruption.

A widely held perception is that corruption levels in different countries differ widely, even when institutional arrangements may be quite similar. To explain this stylised fact has been an early ambition in theoretical corruption *research* (e.g. Andvig and Moene, 1990). Despite the construction of several corruption indexes for a large number of countries, it is difficult to verify whether the distribution of corruption across countries really is polarized towards the extremes or not. These indexes have no cardinal interpretation. One of the leading indexes (Kaufmann et al, 1999) even assumes the opposite as part of its construction - that the distribution of corruption across countries is approximately normal. That is, most countries cluster around some typical, average level. Indirect tests assuming GDP –corruption interactions (Haque and Kneller, 2005) confirm a distribution of countries into a high corruption –low production and a low corruption- high production cluster, however. The existence of observations of petty corruption reported in crime victimisation surveys for a significant number of countries may provide further possibilities for checking the polarization claim empirically to be pursued in the following. Moreover, it appears not obvious from an empirical point of view likely that the increasing similarity of the economic institutional and policy architecture across countries that has followed the so-called globalisation in general, and the demise of the socialist economic systems in particular, may not have caused any levelling of corruption propensities.

2. Independent n-country observations or one international distribution?

Assuming an initially wide dispersion in corruption levels across countries, what would happen when one opens up for higher incidence of international economic

interaction and, hence, also more cross-border corruption? If agents and organizations that are located in low corruption countries interact with public agencies in high corruption incidence countries and agencies and organizations located in high corruptions countries interact with public agencies in low corruption countries, would the outcome be a more even incidence of corruption across countries? And if so, would it approach the high or low incidence countries? Or would the opening up rather cause an increased polarization of corruption incidence across countries? The theoretical issues that arise here has so far received scant research attention. Sah (2005) is a partial exception, but it is sometimes unclear whether he is considering interacting subsystems or just compare them.

Considering the likely interaction between corruption and GDP levels would we then observe a clustering of countries into low corruption – high productivity and low productivity, as Haque and Kneller (2005). If so, we may find one way to resolve the policy paradox reported above – that increased (relative) economic openness may contain national corruption while increased overall openness may stimulate corruption globally.¹

What about the situation when the density of cross-border economic interaction increases while the agents situated in different areas define corruption differently? Here models of cultural identity may be applicable suggesting mechanisms based on evolutionary game theory where increased cross-country economic interaction may either erode or reinforce cultural identities (Olivier et al, 2005). Hauk and Sáez-Martí (2001) have developed a model of corruption where ethical values are made endogenous in a way that may be developed to address this question.

Here we will focus on corruption, but most of the ideas should also apply to rent-seeking in general. In their analysis about the role of institutions for the growth effects of resource abundance, Mehlum et al (2005) emphasize how entrepreneurs may be sorted into grabbing or productive species. If this sorting mechanism is wrong, resource abundance may cause an oversupply of the grabbers. In their discussion the

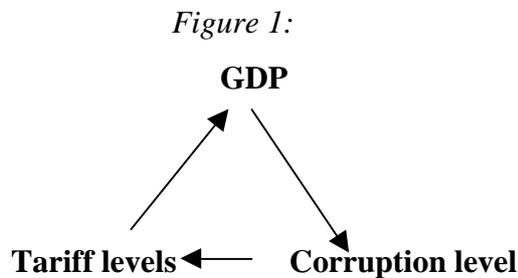
¹ The easiest way to resolve he paradox is to assume that the perception of increased global corruption is simply wrong and mainly caused by herd-like behaviour among experts, businessmen and international officials as proposed in Andvig (2002).

stock of entrepreneurs is given and by implication consisting only of nationals. But what will happen if we consider free movement of entrepreneurs across countries? What will then be the effects of different national sorting mechanisms? Did the opening up of Russia cause an influx of mobile entrepreneurs dominated by grabbers to Moscow in 1991?

A question that naturally arises on the basis of the preceding, is whether the different possibilities may have different geographical implications. May, for example a high corruption levels in one country spill over to its neighbours generating geographical clusters of high (and low) corruption areas? We have not found the question formulated at this level of abstraction in the literature, however. The answer may not be so completely obvious as one may think at the first glance, since we may imagine that a highly corrupt country so to speak soak up many of its conceivable external transactions and will therefore have little impact on its neighbours. There might be little regular cross-border economic transactions to carry any extensive spread of forms of behaviour including corrupt ones. On the other hand, such geographic clustering appears to be established fact. To explain it, we may have to reduce the level of abstraction, however.

Most of the research that either directly or by implication has studied the distribution of corruption levels across countries, their cross-border regular economic transactions and the international institutional architecture, has been performed at a lower level of abstraction. The focus has been the single country. Each country has been put aside of each other. The same corruption is assumed to take place in each, but yielding, of course, different outcomes. The result for each country is then compared. The outcome with respect to the distribution of corruption and economic activity levels across countries and the international institutional architecture is reached by filling in the outcomes for each country. This is a standard and reasonable procedure in comparative studies, but if the outcome for each country is the result of particular configurations of interaction, the assumption of independent statistical trials for each country becomes misleading. At least in the beginning the alternative of non-independence should be explored although it may lead the research into a statistical dead end.

The relevant research for the single country study has been organized as different ways to connect the dots in a triangle consisting of policy instruments, such as trade policy, capital market restrictions, economic variables such as GDP, imports, FDI, and corruption levels, for example as in:



In this case import restrictions are endogenous and GDP levels determine corruption. In the research one may experiment with what should be considered exogenous or endogenous variables. In an influential article Kaufmann and Kraay (2002), for example, strongly insist that the arrow between GDP and corruption levels should be turned around compared to the one shown in figure 1. The dots may be represented with different policy instruments or different economic variables while, of course, the corruption variable remains – as long as corruption is the issue. The corruption indicator chosen, may also differ, however.

Since we are discussing the international propagation mechanisms for corrupt behaviour as well as the ways international cross-border economic opportunities may contain national corruption, we have to study the links between cross-border corruption and the economic variables that are statistically registered such as import and FDI. This is not made explicit in the literature.

3. Sah's models of large and pervasive differences in corruption levels across governance units in mutually isolated vs. open systems

Sah (2005) presents a renewed version of an older model of his, dealing with what he calls 'atomistic' corruption (Sah, 1988), that is repetitive, small-scale corruption. The 1988 model was an early contribution to the study of corruption by means of so-called multiple equilibrium models. They sought to explain large and persistent differences in corruption levels with a minimum of assumptions about cultural

differences. In the 2005 work Sah added the ambition to deal with the “even more challenging research issue ...the presence of such differences across regions within the same country ...”. That is by implication a study of interacting bureaucracies. As concrete cases he was thinking of Bihar (highly corrupt) versus West Bengal in India or Northern Italy (once upon the time low corrupt and not mafia-infested) versus Mezzogiorno of southern Italy. Since both citizens and bureaucrats in principle are mobile across regions, this is an even more open system than the kind of globally open system we have in mind where only subgroups of ‘citizens’, that is companies and entrepreneurs, are mobile. So far, to assume officials to be internationally immobile is reasonable as a first approximation².

Looking more closely at his model, it does not really address this issue, however, but rather the former question: How may we explain persistent difference in corruption levels in similar societies? Belonging to one national state could, of course, be one indication of similarity, but to disregard economic and bureaucratic interaction across regions when exploring how they may evolve differently with respect to corruption appears unconvincing. Nevertheless, read accessorially, the model may generate different possibilities about the outcome of such interactions.

Sah is considering a number of bureaucrats and citizens who are engaged in random meetings. Before they meet, each have to make a decision whether to initiate a corrupt choice in the stipulated transaction of the period. The expected utility of the choice hinges upon whether the other side is making the same choice with respect to corruption or not. Different possibilities are outlined, but most closely studied are the cases where the utility of making the same decision is higher than if the other side makes the opposite choice. Hence, the expected utility for a citizen of making a corrupt choice hinges upon what she believes is the probability of being confronted by a corrupt complementary decision by the bureaucrat. The higher that probability, the more profitable will the corrupt choice be. By symmetry, the same applies for the bureaucrat. In addition to this perceived probability the real underlying advantage of

² Military bureaucracies are an interesting exception. Historically successful military bureaucracies from one country or region may move far into other countries or regions and set their marks on them. At present multinational companies and aid bureaucracies are more frequent example of internationally mobile bureaucracies, although the resurgence of foreign military organizations through peace missions should also be noted as part of the present picture.

making the corrupt deal with a corrupt compared to with a non-corrupt, will determine the relative expected utility, and the choice.

In addition to other bits of information, including initial beliefs, perceived probabilities will be updated by the participants' experiences. This experience will reflect the actual, but random encounters made during the periods of the individuals' economic activity. If an individual meet a corrupt other during the last period, he will adjust his assessment upwards. If he then made a corrupt choice, he will make the same choice. A higher level of corruption in the past results in higher levels of corruption in the future. Actual more corrupt choices made by bureaucrats jack up the citizens perceptions causing them to make more corrupt choices, and so on. While not going into the technicalities of the model, it is not difficult to see that a structure like this may generate widely different corruption propensities on the basis of similar underlying economies.

But what will happen when we have two such economies, **A** and **B** that have generated quite different corruption propensities among their citizens and officials, but where we now allow both a fraction of their officials and and/or citizens to move cross-regionally? Let us say **A** is the highly corrupt region and only citizens are moving. If somehow citizens originating in **A** are able immediately to perceive the probability of meeting a corrupt official in **B** and vice versa – the chameleon case - nothing should happen. If on the other hand, their original corruption experiences are directly transferred to the new settings, a movement towards some levelling of corruption propensities in the regions should be expected.

On the other hand, if individuals are heterogeneous in the sense that some have a higher propensity to engage in corrupt transactions (are more 'evil'), an opening up of activity across regions should cause the dishonest persons in **B** to move towards **A** and the honest one in **A** to move in the opposite direction. Due to the positive spillover from corrupt behaviour among the citizens towards bureaucrats and vice versa, to allow interregional mobility of bureaucrats should only reinforce the results above. As an historical example with mainly bureaucratic mobility across regions with different corruption propensities combined we may note the development of colonial administrations in the 19th century. That combined with heterogeneity among

bureaucrats might have made it relatively more profitable to be a corrupt bureaucrat in a corrupt area inducing a movement of corrupt bureaucrats towards colonial administration, but now we are relaxing the assumptions made by Sah and we move into logically slippery ground. - If we only allow movement from low corrupt **B** to high corrupt **A**, both the levelling and the polarization results would remain, but the 'global' corruption would be reduced in the levelling case, but be undetermined in the polarization case.

While this model set-up does not give much flesh regarding the determination of the allocation of corruption levels across regions or countries, it allows most of the possibilities outlined in the introduction. Nevertheless, the assumption of positive spill-over between corrupt behaviour at the two sides of transactions, disallows at least some possibilities. Corrupt citizens don't move from **A** to **B** in order to exploit honest bureaucrats there (cf. the number of accusations in European immigration policy).

4. Grabbing and corruption in open vs. closed systems

In several papers focusing on the role of resource rents, Mehlum et al (2005) present a model upset that may also be used to analyse the effects of cross-border mobility of entrepreneurs on the allocation of corruption levels across countries.³ In this article they discuss closed economies only. Imagining that a country possesses a given natural resource rent, R , that may be divided between productive and 'grabbing' entrepreneurs, but a specialized grabber may have a relative advantage in gaining access to the rent. The extent of this advantage is interpreted to indicate the institutional quality of the economy in question. The larger the advantage the lower is the institutional quality.

There is a given stock of entrepreneurs, who may switch between being grabbing or producing. Hence, the allocation of the stock between productive and grabbing activities will hinge upon a number of economic factors and they will switch until the rate of profit is equal for the two activities. The production structure is modelled so

³ The results in the following are quite tentative since we make no attempt here to build in the mobility assumptions from scratch, hence, rebuilding their models, but rely on ad hoc ways to see what the likely consequences would be when we allow entrepreneurs to move between countries in different production-corruption equilibria.

that the rate of return for both producers and grabbers increase when the share of productive entrepreneurs increases, but more steeply so for the grabbers. The higher the relative share of producers, the higher the rate of production.

Combining these with some more technical assumptions, Mehlum et al demonstrate that only two equilibria are possible: One where all entrepreneurs are productive, and another where we may have a mixture, a ‘grabbing’ equilibrium.

A major point in their article is to show that increased resource rents will cause increased GDP in an economy, but may cause significant economic decline in a grabbing equilibrium if the institutional quality is below a certain threshold value. What has this to do with our question about the effects of opening economies and the distribution of corruption levels across countries?

Note first that trivial reinterpretation of the variables makes their models amenable for illuminating our concern: They deliberately made their grabbing processes general. Corruption is, of course, a major method of grabbing and natural resources is only one kind of rent. They may be considered as a share of the total stock that is potentially available for ‘grabbing’ through the existence of public organizations. Different ways to organize the public sector (including the society’s natural resources) may create different levels of grab-able rents.⁴ For example, the system shift in the former Soviet Union may be considered to have increased the grab-able rents shifting entrepreneurs into corrupt activities. The regions with lowest institutional qualities should then induce the largest shift for a given rent increase, and the largest production decline.

What will be the consequences of allowing cross-country mobility of entrepreneurs?

Let us look at the simplest case and where the opening up means that the net supply of

⁴ A major difficulty with this simple reinterpretation of the variables is that the distinction between institutional quality and the size of the rents becomes somewhat more fuzzy. If corruption levels followed *pari passu* the more extensive rent-seeking or grabbing activity, so it may be considered just an indication of total grabbing, the reinterpretation does not create major problem in this respect either. As pointed out already by Krueger (1974), there are a number of situations where corruption and rent-seeking may become substitutes, however. The classical case is from the Indian import control regime where building a manufacturing plant in order to get import quotas could be an alternative to a bribe. We assume in the following that such cases are so few that corruption levels are shadowing grabbing levels.

entrepreneurs are increasing the competition for gaining access to both the rents (accessed through corruption) and the production slots. In a corrupt ('grabber') equilibrium an opening up with net entry of foreign entrepreneurs should raise the number of producers, increase production, lower the number of bribers - and increase the profits in both productive and corrupt activities. Will this hold in general?

Let us imagine the two countries **A** and **B** again that have identical production structures, the same number of entrepreneurs, both are in a corrupt equilibrium, and so on, but that **A** either has a public sector that generates more rent, or that it has a lower institutional quality. If the entrepreneurs are unable to move, **A** will have more corrupt entrepreneurs, lower rates of production and lower profits than **B**. If now entrepreneurs are allowed to move freely they will move from **A** to **B**. But then profits and production in **A** will be even lower, the share of corrupt entrepreneurs even higher while the development in **B** should go in the opposite direction as it receives more of the former **A** – entrepreneurs. And this should presumably go on until there are zero production in **A** and the number of corrupt entrepreneurs there are so few that each entrepreneur's share of its rents are equal to the profits of the entrepreneurs in **B**. If we may imagine that the authorities in **A** may be worried by the consequences of the opening up, and introduce a number of restrictions while **B** have no reasons to be worried, we may observe that in this polarized world the country with restrictions will be corrupt and low-productive and the one with high degree of openness and with few restrictions will be low-corrupt and high-productive.

This set-up may also supply several hypotheses of how increased corruption levels globally may be combined with low corruption levels in the most open economies. While difficult to substantiate empirically, there are many indications that the so-called modernization of the public sector (as well as major changes in the private sector) taking place in most countries has increased both the size of rents that are susceptible to grabbing (for example by privatisation of public resources) as well as their grab-ability⁵ (visible for example in increased lobbying and outsourcing

⁵ In Mehlum et al (2005) grab-ability is denoted as institutional quality, operationalized as the un-weighted mean of five sub-indexes aimed to indicate the rule of law, bureaucratic quality, corruption index, a risk of expropriation and risk of government repudiation of contracts. For our purposes corruption has, of course, to be treated separate. Moreover, when grab-ability is a political aim, high bureaucratic quality may hasten the process, and should also be considered separate. Indexes of this

activities). The partition of the public sector in ways that makes sub-sectors sell to each other also increase the likelihood of corrupt transactions as well as grab-ability of rents since selling implies access to cash. Moreover, in some cases the increased grab-ability is tied to measures designed to increase the international openness of the economies.

What are the implications for such a common ‘shock’, the increase in available public rents? Countries that are able to convert the increase in grab-able public rents into private production should increase production and attract internationally mobile entrepreneurs, countries below the threshold should get an even higher share of grabbers in their entrepreneurial mix at the same time as their stock of entrepreneurs as well as production levels are going to shrink. That is, we should expect increasing as well as more skewed distribution of corruption levels across countries.

A large share of the increase in grab-able rents is a one time event due to privatisation of sectors like telecommunications, energy grids, and so on. It may have lasting effects on corruption levels, however, through mechanisms described in Andvig and Moene (1990) or similar stories.

5. Corruption and geographical diffusion of ethical preferences

So far we have looked at models that seek to explain more traditional economic behaviour. As pointed out in Andvig (2006), corruption implies a breaking of rules. When the rules are different in countries **A** and **B**, behaviour that might be corrupt in **A** will be non-corrupt in **B**. If the rules that apply in **A** are exported to (forced upon or imitated by) **B**, corruption is also spread indirectly through the imitation of rules. As we will see, more subtle forms of rule transmissions than pure imitation are also possible. Moreover, not only rules of governance may spread, the methods of breaking them, in this case corruption, or their ethical costs may also spread. Diffusion processes may impact the distribution of corrupt behaviour across countries.

kind may often make interpretations difficult. Very different ‘variables’ are mixed often for the simple reason that one lacks a theory of their interaction, at the same time as one presupposes a high degree of substitutability - a strong theory in fact - between the different sub-indexes by the very construction of an index.

A few authors have begun to study such mechanisms recently, partly inspired by developments in evolutionary game theory.

A model that may be adapted to throw light on such processes has been constructed by Hauk and Saez-Marti (2002), but instead of collective rules they are looking at the distribution of individuals' ethical norms or preferences. They imagine that any population is characterized by its distribution of a trait (or preference) determining whether an individual tends to behave corruptly or not. The trait may be acquired in two ways: A parent may engineer it through a costly teaching process, or it may be acquired through a random meeting of another agent who already possess the trait.

The parents are partly altruistic. While they prefer their offspring to possess the same trait as themselves they are also consider the consequences of the possession of the trait for the child's future earnings. The probability of a child becoming corrupt is increasing by the efforts of its parent, the vertical transmission of preferences (for modelling reason each child has only one parent) and the size of the fraction of the population that is already corrupt, the horizontal transmission of preferences. They assume the two transmission mechanisms to be cultural substitutes (Bisin and Verdier, 2001) that is, they assume that the higher the incidence of the corrupt trait in the population, the lesser will a corrupt parent invests in its offspring to ensure that its preference is transmitted. The same mechanism applies, of course, for the parents who want to transmit the preference for honesty. q is the fraction of honest agents in the population.

As mentioned, the parents do not only care about the ethics of their offspring, but also for the economic well-being it may lead to. To study such consequences, Hauk and Saez-Marti borrow a set-up from Tirole (1996). They introduce a number of principals that may employ the agents on two types of projects, one is yielding more output and is more profitable if the agents are choosing an honest strategy, but is less profitable if they are dishonest. The constellation of economic outcomes for the agents are assumed such that dishonest agents always will choose the dishonest strategy while the honest ones always will stay honest. The principals know q and possess a monitoring parameter which indicates the ease by which they may discriminate between honest and dishonest agents, although they are unable to

determine with certainty whether a given agent is honest or not. The principals may either choose to only implement the low yielding projects that demand less of the agents' honesty, their pooling strategy, or they may try to determine a mix of the two types of projects, their separating strategy.

For a given ability to discriminate between honest and dishonest agents, the principals will switch from a pooling to a separating strategy at a given fraction of honesty, q^* . Parents will invest more in making their children honest if they believe that the principals will choose a separating rather than a pooling strategy. With normal assumptions we may have two internal stationary states, one characterized by a highly corrupt population, with principals following pooling strategies and parents holding pooling expectations, another with a low corrupt population where the principals are separating and the parents expect them to do so. Note that the model outlines two opposite forces if q increases: the principals will tend to use separating strategies making it more lucrative to possess non-corrupt preferences and increase the parents' efforts in that direction, but as q increases the parents will decrease their efforts due to the substitution between horizontal and vertical transmission of preferences assumed.

Interpreted literally, the model makes hardly sense. It is, for example, difficult to imagine that parents deliberately make efforts to teach their children to be corrupt or dishonest, used synonymously here. Parents may, however, teach their children to invest all their loyalty into the family system to which they belong, whether that is of nuclear or extended family types. That may often result in family forms or corruption, lack of guilt feelings when engaging in commercial corrupt transactions when engaged by formal organizations or more complex forms of interaction between contradictory interactions between 'modern'- impersonal - and family forms of transactions (Andvig, 2006). Moreover, the same form of ethics may create problems when trying to develop formal organizations, formulated in the model as the high output, corruption- sensitive matchings of principals and agents. In a case study from a village in Southern Italy Banfield (1958) exposes several links between what he describes as the deeply rooted ideology carried by 'amoral familists', corruption and the building of private as well as public organizations.

The Hauk - Saez-Marti set-up may explain variation in corruption levels, particularly between countries with family-based and non-family based ethics for public behaviour. It is particularly well designed to explain lasting differences across countries. Unlike the preceding models, an opening up of mobility of agents across countries are not likely to cause any larger shift in the distribution of corruption levels across countries in the short run. This is mainly caused by the substitution between the vertical and horizontal transmission of the preferences that lead to corrupt transaction: If agents with highly corrupt preferences move from a country, **A**, with high corruption levels to **B** with low corruption (high q), the shifts in their q 's will be partly mitigated by the tendency of the remaining parents in **A** to educate their children to become more corrupt, while the parents in **B** will tend to do the opposite.

The key to more extensive change hinges upon the interaction between the parents' expectations about the principals' strategy, - whether they expect them to shift from pooling to separating strategies, or the other way around; and what in fact determines the switch

One may question how realistic it is to assume substitution between the vertical and horizontal transmission mechanisms in the case of corruption-related preferences. They may rather be complementary, that is parents will be more deeply convinced in the correctness of teaching their children the overriding importance of family loyalty the more frequent the children are exposed to random agents that share this conviction. In this case the model is likely only to have stable stationary states where either all or none are corrupt (as the complementary case in Bisin and Verdier (2001) models of cultural transmission). This is, of course, not reasonable predictions, and some limitations on reasonable movements in q would be needed, but even so, the scope of more dramatic changes when agents with different preferences are allowed to move, is reasonable. It is also difficult to imagine that emigration or immigration may cause so large shifts in q of the population at large at short notice – unlike the former model's population of potentially grabbing entrepreneurs who is likely to be much more mobile.⁶

⁶ We may, however, reinterpret the model in a way that may give greater scope for shifts. When we may consider the ethical preferences in the population to have a putty clay structure where not only the actual matching of parents, children and the surrounding population are forming the preference

In these last sections we have studied some very general ways of how the corruption propensities in closed systems may respond when opened up to, confronted or mixed with systems characterized by different propensities. Fitting this level of generality, we did not outline any specific mechanisms for economic interaction except allowing agents to move between the systems or to receive some general forms of information about the characteristics of the other systems. In the following we will look at some of the traditional forms of economic interactions across countries: International trade, technological spillovers, foreign direct investment and other forms of cross-border financial and international migration flows as well as the existence of cross-border organized activities in the shape of multinational companies.

It is not obvious how these (mainly) flows may be connected to cross-border corruption. While it may be the case that the more open an economy is, the less corrupt it is. Nevertheless, in order to study the propagation as well as the containment of corruption across countries we should be aware of the conceivable spillover mechanisms. Since no direct measurement of cross-border corruption takes place, a natural starting point is to see how these spillover mechanisms may be related to the cross-border aggregates for which we have statistical information. We turn to these issues in the next section. Here it may also be the best place to define the concepts of corruption we will use in the following.

6. Economic cross-border flows, cross-border corruption and other definitions

Let us first define the corruption concepts used. Here we will follow Andvig (2002, 2006). Many, somewhat different, definitions of corruption are current in the literature. The one most frequently used one is ascribed to Nye (1967: 416) and defines corruption as “behavior that deviates from the formal duties of a public role (elective or appointive) because of private-regarding (personal, close family, private clique) wealth or status gains.” Interpreted literally this definition is too wide for most

putty, but all relevant bits of information that reach the children until their preferences become clay. When stylised as a fraction of the total information that stimulates corrupt preferences, larger shifts are obviously conceivable.

purposes, since almost every official would then behave corruptly. A more reasonable interpretation would be it to cover serious acts of bribing and extortion at its core, and depending on the context, to include various types of private-regarding activities at its edges. I have few objections to the standard definition interpreted this way, but I have found the following one – based on Rose Ackerman (1978: 6-7) somewhat more precise and useful for my purposes:

- An act is *commercially corrupt* if a member of an organization uses his position, his rights to make decisions, his access to information, or other resources of the organization, to the advantage of a third party and thereby receives money or other economically valuable goods or services where either the payment itself or the services provided are illegal and/or against the organization's own aims or rules.

- If the act is mainly motivated by the intangible valuables received, is given by the member serving the interests of friends or family, or his own standing in family-friendship networks, it is an act of *family-friendship corruption*.

- An act represents *embezzlement* if a member of an organization uses his rights to make decisions, his labor time, his access to information or some tangible assets of the organization to his own economic advantage, eventually to the advantage of some other members of the organization, in ways that are either illegal or against the organization's own aims or rules. Embezzlement might also be motivated to achieve the individual's standing in family-friendship networks

Regarding this set of definition we observe that corrupt transactions are not a set of actions that may be observed as such. Corruption has to be related to a set of rules about the proper procedures for transactions; when a person acts corruptly, a transactional mode (Andvig, 2006) is broken. Both family-friendship and commercial corruption imply a transaction between at least two actors, one of whom has to be a non-member of the organization. In the case of regular, commercial corruption, there is an illegal or illegitimate expansion of market transactions into the fields of bureaucratic or political fields of transacting. It is obvious, but rarely made clear, that when the rules for the proper dividing lines between bureaucratic and market transactions shift over time or across countries so will the scope of what should be considered corrupt.

Embezzlement, on the other hand, may often be performed by a single insider, but large scale embezzlement normally involves several people. More importantly, the rules broken are different. While corruption in the narrow sense raises the question of the proper way of making transactions, embezzlement challenges the *property rights of the organization*, including the proper internal allocation of the decision-making rights

Here again the question arises when the system of property rights shift over time or across countries: Are the possessors of present rights embezzlers?

Cross-border corruption is the set of all corrupt acts where the one side of the transaction involved is located in one country, or represents an organization located in it, and the other is located in another country, or represents an organization of it. Even if the representative of a bribing organisation is local, but the head office is located outside, the bribing is considered to represent cross-border corruption. In addition to cross-border corruption, a number of direct spillovers will be included (together with cross-border corruption) in what we may designate as *international corruption*. One such direct form of spill-over of corrupt behaviour is corrupt transactions performed by agents who have accomplished trans-border migration. Another example is when a local importer bribe the customs. Since he/she has already acquired the property right to the good in question it is not a case of cross-border corruption as it would have been if the bribe was paid by the exporter. All corrupt transactions where one side is a member of an international organization are also included in international corruption. Corruption that is not cross-border is *internal corruption*. Corruption that is not international, is *local corruption*. While cross-border and internal corruption is clearly dichotomous, local and international corruption may overlap as the corruption spillover effects of the cross-border economic transactions work themselves through the economy. Internal plus cross-border corruption is equal to a country's *total corruption*.

Aggregating total corruption over the set of countries we reach *global corruption*. In order not to double count cross-border corruption of country A we should not include the corrupt transactions performed by A nationals in other countries. In a similar way as we do in national income accounting (GDP versus GNP), we may, if we so wish, count all the A nationals corrupt transactions at home or abroad as total A corruption, and the A nationals' foreign corruption may give a different estimate of the cross-border corruption of A. For some purposes we may then distinguish between country A's *imported* and *exported* cross-border corruption. Hence, it will not be surprising if some of the least corrupt countries might be some of the largest net exporters of corruption.

In the rest of this section we will map some of the typical forms of corruption that (imported) cross-border economic transactions may give rise to, that is forms of

international corruption. The idea behind the mapping is to look at examples of the conceivable mechanics in the transmission of corrupt behaviour from one country to another. Since most public organizations are immobile, much of the eventual direct spread of corrupt behaviour has to be connected to cross-border, mostly statistically registered economic transactions.⁷ Spelling out some of these mechanisms don't imply that the more open an economy is, the more corrupt it will be, although its cross-border corruption is likely to increase. It does illustrate however, that if increased openness cause lower total corruption, there must be some underlying forces that may induce cross-border and internal corruption to become substitutes.

What kinds of corruption could international trade give rise to? In terms economic value, trade is the heavy flow of the cross-border economic transactions. The case of international trade with extensive import and capital controls will be briefly discussed in a separate section. That case excepted, it is imports that normally will give rise to corruption. Like homeland trade, the exporters of goods and services will experience perceived excess supply and hence have incentives to offer kickbacks to private and public procurement agencies. Most of this will consist of private-to-private corruption. In most cases the actual payment of bribes or kickbacks are delegated to the importing agencies or separate local middlemen. The extent of these forms of corruption will, of course, vary with the kinds of goods and services in question and the local competitive situation.

In the literature it is often assumed that increased import implies less corruption of this kind since it may break local monopolies. While probably true on average it needs to be qualified. A pure monopoly with full bureaucratic control of its sales agency have no incentive to pay bribes of this kind, but may have incentive to pay bribes at the political level to influence the government demand function, and if the monopoly is contestable, to pay for political protection of its monopoly. One or many suppliers give less scope for corruption of this piecemeal variety. Increased trade will, of course, tend to increase international corruption of this form, but may through its impact on the competitive conditions of the markets, decrease the total corruption related to trade.

⁷ There exist, of course, other ways corruption- relevant behaviour may conceivably spread: international media, educational institutions with international recruitment of students, multinational organizations with multinational recruitment, and so on. The educational institutions are likely to be exceptionally important for the spread of political corruption.

The most obvious among the possible forms of corruption generated through international trade is bribing of customs officers. One would normally expect that higher tariffs would give stronger incentives for bribing the officers, but tariffs are not the only incentive. Even with minimal tariffs customs officers have the power to stamp imported goods as legal or not, and may at the very least cause considerable delays, thereby having considerable powers of extortion. Sometimes legality grants are rather to be avoided for example when importers are heavily involved in the informal economy. Customs officers may then assist in smuggling the per se legal goods through the legal ports of entry against bribes. This becomes even more important when the goods are illegal. In both cases importers have the alternative of smuggling outside the legal points of entry, but also in this case corruption may arise through the bribing of police. The containerisation of international trade is likely to favour smuggling through the legal points of entry, however.

In countries with high corruption propensities, the relative share of the underground economy is expected to be large. While one should expect the import propensities of the underground economies to be lower than in the formal economy, the share of its imports that will be unregistered and hence will be either smuggled directly or with bribes should also be expected to be high. Neighbouring countries with sizeable underground economies should be expected to have considerable two-way international trade of this kind. This is one of the most direct corruption spillovers that may lead to a geographical clustering of corruption propensities.

International migration may give rise to similar forms of corruption of police and customs officers. Again we may distinguish between migration that only misses the stamp of legality and migration where the migrants are intended to provide services that are illegal on a more lasting basis. Unlike illegal imported goods, illegal migrants may be in need of continuous legal protection, i.e. become lasting sources of bribes. Moreover, customs officers are not in a position to grant legality to migrants. They may have to bribe both the exit and entry authorities which in this case will be the immigration authorities (eventually an international organization), not the customs. Larger flows of international immigration whether it receives legal stamps or not will then tend to induce international corruption. It is unlikely to be so substantial to have the dampening effect on local

corruption as international trade through its effect on competition. However, if one has a large flow of legal immigrants with substantially lower corruption propensities, it is conceivable that they might create a downwards pressure by mixing with the original population in ways outlined in the models sketched in the preceding section. At present most of the migration is from high to low corrupt areas, however.

Foreign direct investment has been the indicator of cross-border economic activities that has shown the steepest rise the last decade or so. It is used as an indicator of real investment initiated by foreigners, but is in fact an indicator embracing both real investment processes and financial transactions. The last aspect may only reflect pure ownership changes without any real investment made by either locals or foreigners. Presumably, the forms of corrupt transactions attached to the two sets of activities embraced by the hybrid FDI variable may differ significantly. In both cases FDI implies a shift (or creation) of foreign control of an enterprise. That shift itself would demand a permission of the relevant national authority which again implies that the permission may only be granted through a bribe. When a new foreign-controlled enterprise build up a new set of economic activities from scratch, using new capital instruments, a much larger set of permissions would be needed - as it would be if the enterprise was locally controlled. Every permission opens up the possibility of bribes or extortions, hence cross-border corruption. A pure ownership shift may only demand one new permission, but for some countries it may trigger a renewal of all the permissions involved, hence increased FDI would induce increased (total) corruption in this case.

This does not invalidate the seemingly robust negative association between FDI and corruption levels we may find in the empirical literature. It is clear, for example, that the bureaucratic complexity of starting up an enterprise, whether foreign or locally owned, and the corruption indicator of the country is strongly associated. Hence, such complexity is likely to keep foreign investment away. It would not be surprising if this effect dominates the direct positive association between FDI and cross-border corruption.

A sizeable share of international corruption is tied to public procurement, particularly to large construction projects (construction for private organizations such as oil companies is also exceptionally exposed to corruption) and military hardware. However well the

bidding process is organized the risks of corruption remain high. Neither theoretical models (Celentani and Ganuza, 2002) nor empirical studies (Hellman et al, 2000) indicate that *international* bidding would reduce corruption in this field. While we know that public procurement constitutes a significant component in aggregate demand (10 – 15% of GDP in most OECD countries) we don't know how large share of country imports that may be tied to these bidding markets.

Naturally, as the density of economic interaction between individuals and organizations across countries increases, the stock and flows of debts between agents located in different countries also increases. Particularly since the lifting of the former batteries of controls on the financial markets and the increased convertibility of most currencies, the cross-border financial flows and foreign ownership of financial stocks have increased. Unlike the case of real goods and service markets, where perceived excess supply is the typical situation, perceived excess demand for loans will be typical in the credit markets; hence, we will expect eventual bribes to be paid by borrowers to creditors. Cross-border credit should not differ in this respect. Hence, the larger the international financial flows for a given control regime, the larger would cross-border corruption. The lifting of controls should work in the opposite direction, if it keeps the loan rate below the market rate of interest.

When we are considering the impact of changes in the international financial on cross-border corruption, these flow aspects of debt may be of less importance compared to the stocks. As Hicks (1969: 73) made clear, after a credit is granted, the debtor would like to get rid of the whole stock of debt incurred, to default. Much of the regulation of financial markets, including the international ones, is constructed in order to make that option difficult. Somehow financial fraud or embezzlement on whole stocks is the typical economic crime in the financial sector. It is easier to embezzle money or credit than machines. Small flows of bribes may be sufficient to embezzle large financial stocks. An international system is more difficult to control for this than a single country.

In particular, the uneven strength in control rights (private and public) across countries may be exploited for the purpose. Let **A** be a country with weak and **B** a country with strong control rights. A public organization in **B** may, for example, lend a public organization in **A** 1 billion US\$. Individual **x** in **A** bribes **z** (also in **A**) with US\$ 100 000

to get access to the loan of 1 billion pretending he is constructing something and transfer the 1 billion back to **B**. Thereby **x** has used **B** to establish the hard property rights to the billion that he would be unable to do in **A** at the same time as he is exploiting the weak public organization and property rights in **A** to get rid of the specific individual claims against himself. The public organization in **B** would, of course, make all efforts to keep its hard claim on the public organization of **A**, and is also likely to achieve it.

While extremely stylised, the procedure where modest bribes may generate large shifts in assets, exploiting an international architecture that combine a financial system that may move claims around the world with low transaction costs (high mobility) with a distribution of highly uneven hardness of control rights is likely to reflect hard realities, or so it will appear when we look at some of the African data to be considered in a follow-up paper.

In this case both **x** and **z** are locals, hence it is strictly speaking a case of local corruption, but the instruments and consequences are so intimately weaved into the international system that we will treat it as a form of international corruption. Moreover, it suggests one of the more plausible mechanisms where increased openness globally may stimulate global corruption while the most open countries may be the least corrupt.

This form of embezzlement is easier to implement if at least **x** is a politician. Foreign companies may also be involved in bribing at the political level when involved in large contracts, if they see the possibility of recurrent import orders of some magnitude, and so on. We will expect it to be positively related to both imports and FDI levels. Needless to add, the growth of so-called tax heavens that have followed the opening of national economies have facilitated transactions of these kinds as they are designed for transferring soft (claims of doubtful legitimacy) into hard claims and hard into soft debits.

Another source of international corruption arise through the interaction between officials from different countries, indicated by the size of foreign aid. We mentioned the extreme possibility of large-scale fraud. More pedestrian, but important is the countless number of aid projects that are distributed across aid-receiving countries. Corruption that arise in those may be considered as part of international corruption even if no officials in the aid-

giving country may be directly involved. The same applies to the more recent forms of general budget aid.

7. Growth theory and the geographical spread of corruption densities

It is rather obvious that if corruption levels somehow have negative impact on economic growth rates, and persistently so, one should after a while also observe a negative association between corruption (C) and GDP levels. Furthermore, if GDP levels have negative impact on corruption rates, one should expect a tendency towards clustering of into poor and corrupt and affluent and low corrupt countries. The longer a growth process of the kind suggested persists, the more skewed distribution of corruption and GDP levels one should expect. If the degree of openness of the international economic system in the meantime has opened up, the skewed distribution of corruption levels may be wrongly be ascribed to it, being mainly caused by different national growth processes. Furthermore, if the positive growth is going together high and increasing levels of international trade, one may observe high trade intensity going together with low corruption and high GDP levels, opening up the possibility of ascribing further causal structures.

One possibility is to look at the triangle international trade, GDP and C as determined in a simple old-fashioned Keynes model: export determines GDP, GDP determines C. To increase export is the key. If that increase is conditioned by openness, openness is the key. Increase exports gives increased GDP gives reduced corruption. This might be turned around: C determines GDP and GDP determines imports and thereby the degree of openness. One might look at the data to determine the degree of correlation, and through different econometric techniques determine which direction of causation that appears most reasonable. Kaufmann and Kraay (2002) argue for the C –to – GDP causation. If so, anti-corruption policy appears to become very important. Significant changes in corruption levels may cause large shifts in GDP levels. Lambsdorff (2003) illustrates that possibility. But do effective anti-corruption policies exist, and if they do, may they impact GDP-levels directly? If corruption mainly affects GDP growth rates, not GDP levels, to correlate present GDP with present corruption will tend to overestimate its impact on GDP.

Blackburn, Bose and Haque have developed a set of models (Blackburn, Bose and Haque ,2002, 2003, 2005) that build corruption into a framework of overlapping generations growth model intended to simulate what appears to be the set of stylised facts of the distribution of corruption across countries. The models focus on bureaucratic corruption, but specify different forms of bureaucratic acts. In Blackburn, Bose and Haque (2002, 2003) they may collide with the higher income citizens in tax evasion, in (2005) they receive bribes in public procurement processes. The production functions are also somewhat different, but in all 'output' from the public sector functions as a kind of input in the production function. The more corruption the lower is this input. The production process is guided by profit maximization. The public output increases the marginal productivity of both labour and capital. Capital and labour are complementary factors in the production function. Hence, the larger the capital stock, the higher the marginal productivity of labour, which determines the wage rate (the supply of labour is fixed).

The wages of the public officials are set by the wage rate in the private sector. The gain of bribes for the bureaucrats has to be set against the expected loss when caught. That loss is determined by the wage rate. For a given capital stock, the more extensive the corruption, the lower the public output and the lower the wage rate. Hence the relative gain by choosing the corrupt action increases with the number who chooses it. As the capital stock increases, the wage rate also does so, and the relative value of the corrupt option decreases. Compared to the rather arbitrary corruption equilibria in most former multiple equilibrium models, the size of the capital stock (per capita) here anchors the corruption rates.

If the capital stock is sufficiently low all corruptible bureaucrats will choose the corrupt action in a low output, high corruption economy with low steady state growth paths. Any capital stock lower than this lower bound will also have this maximal corruption rate. If the capital stock is sufficiently high, on the other hand, no corruptible official will choose to become corrupt and we will observe high output, high growth rate economies with negligible corruption.

Hence, both around the lower and upper bound levels of capital stock we should expect small variation in corruption rates. For economies with level of capital stocks between

the upper and lower bounds, on the other hand, multiple equilibria are possible. The main mechanism here is the positive spillover effects from the other agents' choice of corruption on the relative value of the corrupt option. Hence, here we should expect greater variation in corruption levels. All together, these models appear to accommodate the main facts of high corruption rates in poor countries, low corruption rates in rich ones and wider variation in the corruption rates of the intermediate regimes.

We should note that here a cross country distribution of corruption rates are predicted on the basis of parallel growth processes that do not assume any cross-border interaction. The initial – to the growth process – distribution of capital stocks is the main predictor. It is reasonable to assume that the import levels increases with output. Hence, the high output low corruption rate economies will be the most open ones, but the openness as such has nothing to do with the low corruption rate. It is a pure coflux relation.

The Blackburn et al's models have a number of appealing features. Several of the unrealistic assumptions are, of course, made purely for the needs of stringent model building (particularly its overlapping generation features that we haven't exposed here), and it would be inappropriate also to criticise them here where we are not focused on the model technicalities. It is a problem, however, that it is the loss of comparable wage income that is the main driver of the result that richer countries have less corruption. Richer countries have richer bureaucrats who thereby have more to loose. But would not the risk of loosing your wages in a poor country felt to be higher? Here you may risk to sink into an abyss of poverty. In any case, a model of this kind could be built by varying the degree in the efficiency of monitoring technology with GDP levels that should yield quite similar results.

Mauro (2002) produces two models. One is very close to Blackburn et al (2002, 2003) and applies a similar Barro (1990) inspired way of introducing public output into a neo classical production function. The second model relates corruption, growth and political instability. The way corruption is introduced differ somewhat, but the conclusions are similar. Ellis and Fender (2003) also use a Barro-like mechanism to make public investment play an output-enhancing role and makes corruption drag down output that way. Again, the corruption mechanism is different, focusing more on political corruption. The dynamics are more complex by the authors introducing a kind of

recognition lag between the point of time when a bribe is grabbed and the time it is recognized by the public as a bribe with the corresponding potential political impact. This lag is set equal to the production lag of public investment. The longer the lag, the less transparent is the public sector. Again, the model predicts similar relationships between GDP, its growth rate and the extensiveness of corruption in the public sector as the ones of Blackburn and Mauro.

Ellis and Fender (2003) develop an outside option for corrupt politician that is of particular interest from our point of view. If the politicians may safely retreat and move to a foreign country with the corrupt income gained, corruption increases; both private and public consumption decrease and the economy is shifted into slower growth paths. - When looking more closely into the potential empirical role of corruption for capital exports from a number of African countries, we will spell out their assumptions in more detail.

Ehrlich and Lui (1999) have developed a different set of models that also partly relies on modern endogenous growth theory when studying the impact of corruption. They do not apply any Barro-mechanism, however. The negative output effects of corruption work mainly through reducing the accumulation of human capital. Agents may either accumulate productive human capital or 'political' capital. Political human capital increases the agent's share of consumable output (rent) without contributing to the making of output. The more he/she invests in political capital compared to the rest of the group, the larger the share. Ehrlich and Lui interpret the whole public sector as relying on this mode of distribution. Hence the larger the public sector, the more extensive is the corruption and the stronger the incentive for accumulation of political capital. One of the reasons why modern economies is less hampered by corruption, is however, that they allow a complete specialization of agents into human capital investing and political capital investing agents. The more productive the human capital and the larger the share of its investors, the higher is the growth rate.

It may be difficult to take their negative vision of the whole public sector seriously. Considering that most kinds of income are generated through some joint efforts (whether it is the government taxing income or a private company manufacturing output) where it is in most cases hardly possible to determine agents' marginal contributions, and if it

were, it may not become the obvious rule for income sharing. They are in fact pointing out a very general mechanism that not only applies to the public sector: Agents are likely to make considerable efforts to increase their share both through influencing the share of their income-generating group as well as their own share within this group. These sharing rules may be more or less easy to influence through direct efforts, hence each member's efforts may be directed more or less into this 'political' direction. In different ways extended family systems, project methods of organization may, for example, cause over investment in networking, that is, investment in human political capital. To consider all such investment to be corruption may be to stretch the concept too far, however, although they are pointing at an important issue that has worried economists throughout the ages.⁸

Whatever the precise interpretation of their models, Ehrlich and Lui (1999) present corruption and growth rates as two endogenous variables, likely to be inversely related, as have been the case with the former growth models. They also present empirical estimates. It is clear, however, that it is difficult to discriminate between these different growth models on the basis of econometric results. The reason is partly that their reduced forms are quite similar, but partly the lack of precise and direct knowledge of the different forms of corruption. So far, the econometric research has to rely on very aggregate and probably very noisy indexes of corruption. They are unable to discriminate, for example, corruption in tax collection from corruption in public procurement, or bureaucratic versus political corruption. In a later paper these model will be explored more closely in order to determine the possibilities for empirical discrimination.

⁸ The idea that the efforts in rent-seeking (whether by peaceful or violent means) may be seen as a process where each will receive a share that is determined by his/her efforts compared to a kind of average efforts, is an old one. They may easily generate multiple equilibria through their strategic complementarity. Pareto made an early statement as emphasized by Haavelmo. In addition to the rent-seeking/corruption field the present models of this kind focus on warfare and power. Some years ago they were also applied in analyses of inflation (cf. Andvig, 1977).

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