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The Decentralization of Public Services

Lessons from the Theory of the Firm

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Questions about decentralization in government are questions about the allocation of control rights. How much to decentralize depends on which level of government will have the most incentive to bring about desired outcomes.

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Summary findings

The literature on the theory of the firm is rich in theoretical and practical insights. The key messages in this overview are the following:

- The modern theory of the firm provides many insights into political organization, for political jurisdictions can be viewed as pseudo-firms that provide services and that group together various kinds of decisionmaking activities.

- Questions about decentralization in government are questions about the allocation of control rights. If contractual relations were complete, it would not matter whether power were decentralized, as contracts would specify everything to be done at each level of government. There would be no need for discretion.

- How much to decentralize depends on which level of government will have the most incentive to bring about desired outcomes. Centralized governments may be better at coordinating things but tend to be less accountable than decentralized governments (with important exceptions).

- The organizational design of government affects not only incentives to make decisions but also incentives to gather the information on which those decisions are based.

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The Decentralization of Public Services:
Lessons from the Theory of the Firm

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1. Introduction

The large expansion of government powers in some of the Western countries in the post World War II period was given theoretical backing by the theory of market failure, and the achievements of the studies of externalities, public goods, and optimal taxation. Many of these studies have found their way into the analysis of economic development issues. During the 1980s, these theories, or at least their applications in the public debate, have been justly criticized for their lack of attention to government failures. Moreover, in recent years government intervention in the economy has come to be regarded with more suspicion than in the past and an increasing number of policymakers in countries as different as Argentina, Mexico, China or Hungary have adopted a more pragmatic approach to development favoring reliance on the market to allocate goods and service.

The theoretical intuition behind the superiority of market allocation is well known. Given the efficiency of market exchanges, agents should be left to make as many decisions for themselves as possible. When these decisions are transferred to the public sector, there are asymmetries of information and the associated opportunities for rent seeking activities, and the loss of efficiency may be large enough for even the poorest members, who are supposed to benefit from these policies, to lose out.

These insights have been transfered to the organization of the public sector itself. If political economy teaches us that as many decisions as possible should be decentralized through the market, doesn't it follow that within the public sector decisions should also be decentralized as much as is feasible? What one cannot leave to private initiative should be

left to the lowest possible level of government.

Things are not that simple because these policy insights are based on a very unbalanced theoretical underpinning. Economists have a good theory of the functioning of markets, their benefits and their failures. Our understanding of governments and of public administration is much more imperfect, in great part because the topic is more difficult. When one compares markets to public provision, one compares something understood relatively well to something one does not understand very well at all. The situation is even more complex when one wants to compare two types of public provision, for instance a very centralized government with a federation that leaves much power to local units. One compares two situations of which neither is understood very well.

We believe that improvements in the analytical treatment of the internal functioning and of the optimal structure of government should be accessible through the transfer of the intuitions developed in the theory of the firm in the last twenty years. Some work has been done on this topic, but much more can be done. In particular, the very important advances of contract theory in the last ten years have not been adequately integrated into the discussion. The aim of this paper is to open channels of thoughts along these lines, with a special emphasis on the provision of infrastructure. This is not to imply that results from the theory of the firm can be directly imported. The public sector has very specific features, some of which will be discussed below. What can be imported are intuitions and techniques for the study of organizational problems. Furthermore, normative issues are of much greater importance in the choice of optimal policies than appears from the summary that follows, and we neglect them for the major part of the sequel.

The paper is organized as follows. In section 2, we describe a simple model that lies, at least implicitly, at the basis of much of recent policy discussion. In section 3, we enrich this model through the use of contract theory, as developed in the 1970's and the beginning of the 1980's. This enables us to discuss the problems of transfers among jurisdictions as well as aspects of financing. In section 4, we discuss the shortcomings of these approaches and show that recent developments in contract theory and the theory of organizations — incomplete contracts and renegotiation — provide a natural language to speak of some of these issues. The sequel of the paper is used to develop applications of this methodology. In section 5 we try to provide some preliminary reflections on the concept of political jurisdictions, paralleling the famous "nature of the firm" debate in organization theory. Finally, section 6 provides a pot pourri of applications.

2. The received wisdom on decentralization

This section summarizes the received wisdom on decentralization of responsibilities for regulation and provision on goods and services in the standard public economics literature. It outlines the key assumptions underlying the main policy guidelines of the standard public finance literature on fiscal federalism, focusing in particular on those that can much more easily be addressed by relying on a contractual approach to the issues raised by the structure of government.

2.1 A Quick Survey

The standard public finance literature provides both ex-ante and ex-post arguments for decentralization. The classic ex-ante case for decentralization is provided by Oates in 1972. He points out that public goods can have spatial characteristics reflecting the specific boundaries--global, regional or local--of the benefits they provide to their consumers. Oates' decentralization theorem suggests that, for a given information structure about demands, each type of good should be provided by a level of government -- say central, state and municipal--enjoying a comparative advantage in accounting for the diversity of preferences in its choice of service delivery. Club theory provides related arguments to make the case for an optimum size of local authorities.

Based on these demand elements and on the recognition that spillovers and other forms of externalities in production and consumption can matter, a "standard" list of desirable expenditure assignments--in terms of provision and/or responsibility--provides the basis of the policy guidelines for countries considering a decentralization of government structures. For instance, airways and railways should be a central concern in view of the national scope of their benefits and costs, while provision of services in highways could be national, state or local--reflecting the balance between spillovers and local preferences.

Where does the comparative advantage of the various government levels come from? It reflects an assumed government failure. In one version, the failure stems from an information asymmetry between central and subnational governments. Central governments are assumed to have some institutional disadvantage in picking up local information on

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preferences. More decentralized governments have better knowledge of local preferences, either in the sense of having access to information denied to central government, or in the sense of observing preferences with less noise. In a _second_ version of the government failure argument, the central government is assumed to be institutionally compelled to adopt a uniformity constraint in service delivery. Even if it were able to identify the diversity of demands across regions and municipalities, it could not diversify its supply accordingly. These failures reveal the second best nature of the decentralization argument.

The classic ex-post case for decentralization was made by Tiebout in 1956. Tiebout's point was that population mobility reinforces ex post the ex-ante case based on superior information or flexibility of local government. This mobility should eventually ensure a perfect match between public sector supply and consumer preferences. Consumers vote with their feet and move to the municipality or region which provides them with what they want both in terms of services and in terms of financing mix -- taxes, user fees, etc. In sum, it explains how jurisdictions of optimal size come to be established or how individuals take membership in these "local clubs".

2.2   Shortcomings of the Tiebout approach

Since most analysts of fiscal federalism have used generalized versions of the Tiebout model in which the incentives of the different districts are fundamentally linked to the ability to attract new inhabitants and/or new capital, it is worth focusing on some of its limitations as a model of political decentralization in practice:

1)   The role of the national government is not endogenous, or rather it can only be considered as trying to circumvent the negative aspects of the competition between jurisdictions.

2)   The governments' objectives in the Tiebout model are assumed to be profit maximization (see Bewley, 1981), without any discussion of how such objectives might arise from a realistic model of the political process. The latter issue is generally only addressed explicitly in public choice models.

3)   Government failures (including corruption) can arise at the subnational level just as much as they arise at the central level.

4)   The actual mobility of factors is generally much more limited than assumed by Tiebout and the effect of positive decisions by the government of one district will influence the competitive position of the district only in the long run. From an empirical point of view, as pointed out by Walsh (1992), the main relevance of the model is in a metropolitan setting—i.e. within suburbs located near other communities and hence with exit options than in communities with no or fewer exit options.

5)   Mobility can give rise to externalities which are not accounted for in the design of the financing mode of the jurisdiction.

6)   In practice, politicians often try to favor specific interest groups in their districts (for instance, US congressmen will try to introduce in the law tax breaks designated to favor specific firms whose headquarters are in their districts). Tiebout theory would predict more stress on favoring the transfer of factors of production to the district.

7)   Responsibilities are actually often shared by various levels of government. For instance, governments must decide on aggregate road expenditures in a jurisdiction, and on the allocation of this expenditure among different types of roads. The first decision can be left to the federal government and the second to the local government. Similarly, the federal government can set pollution standards, and the local government can be in charge of monitoring their implementation (see Estache and Zheng (1992) and (1993) and Jack (1992)). The difficulty in the study of this responsibility sharing mechanism stems from the modelling of the incentives of the different levels of governments.

In addition to appreciating the particular shortcomings of the Tiebout framework, it is important to appreciate what the underlying approach can and cannot be expected to achieve. Tiebout's basic insight was that population mobility can enable governments to overcome the well-known problem of inducing citizens to reveal their preferences for public goods. This problem arises if governments have no way to exclude from consumption those citizens who state that they would prefer not to pay for the provision of a certain public good. If goods are "local", however, they can be provided only for the citizens of a given local jurisdiction (together with a local tax), thereby excluding from consumption all non-residents and allowing citizens in their choice of residence to select their preferred combination of public goods. In the limit, when mobility is costless and various other technical conditions are satisfied, the public goods problem disappears and the allocation of resources is efficient.

The Tiebout approach has nothing to say, however, about how the appropriate local

bundles of public goods might come to be established. This might, of course, happen as the result of spirited competition between independent local governments (though to do so they would have to be profit maximizing, and it is far from clear how such a goal might emerge from any plausible political process). But there is no reason in principle why a central government could not also put the Tiebout insight to use, and differentiate its supply of public goods by locality in order to induce the revelation of preferences. In short, the Tiebout model describes the virtues of local differentiation of public goods supply, not the virtues of decentralization of power. In order to understand the pros and cons of decentralization as such, it therefore needs supplementing by an account of the respective abilities of central and local governments to undertake the kind of local differentiation whose virtues the Tiebout model has described.

Such an account would return us essentially to the ex ante approach to decentralization. Underlying many scholarly as well as popular accounts of decentralization is a view of the essential informational advantages of local government, and an implicit model with the following elements[1]:

1) A country is divided into n districts, and there are no other political divisions, either above the district or below it.

2) Each district has a local government which has knowledge of the relevant characteristics of that district.

3) Each local government takes decisions in the interest of its own district, without

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[1] A model with the some of the features discussed below is presented in De Groot (1988).

taking into account the desires of other districts except if this is imposed by the federal government.

4) There is a central government that takes decisions in the interest of the country as a whole (whatever exactly this may mean).

5) The central government knows only the average of the characteristics of the districts. Consequently it can do no better than implement a uniform package of public goods for all districts[2].

For each issue, the power to take decisions is given either to the central government or to the local governments. The types of issue that we have in mind are the levels of expenditure on elementary education, pollution standards, the mileage of new roads to be built.

Such a model yields results that are quite close to the "common" wisdom on decentralization: there is a fundamental tradeoff between decisions that are more appropriate to local conditions and the internalization of externalities. There are of course other benefits from coordinated decisions than simply the internalization of externalities: those due to the exploitation of increasing returns, for instance.

The drawback of the model, however, is that it leaves the informational advantage of local government essentially unexplained. To explore this issue further we turn to a

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[2] This inference is not correct in a dynamic model in which the central government, while initially uninformed, experiments with differentiated public good supply and thereby learns about the different characteristics of the districts. This would be similar to a tatonnement process in Walrasian models. We are not aware of such a dynamic model explicitly developed in the public finance literature.

discussion of the implications of recent developments in contract theory.

3. A simple contract model of decentralization

In this section, we revisit the preceding model with the help of a simple contractual approach. This allows us to enrich the description of the communications between federal and local governments. We begin by a brief exposition of revelation contracts, and apply the insights to the problem of decentralization.

3.1 Asymmetry of information and contracts

It is hard to overestimate the revolution that took place at the begining of the 1970s in economic theory. For a long time, economists had talked informally about the strategic use of information (see for instance the famous planning debate of the 1930's between Hayek and Lange (1938)), but it was not until over thirty years later that the strategic use of information was for the first time formally integrated into our models. This revolution changed our understanding of markets (following the path breaking contributions of Akerlof (1970) and Spence (1973)) and of incentives in organizations (following the no less path breaking contributions of Groves (1973) and Weitzman (1974)).

The basic framework is very simple. A federal government wants a municipality to build a sewage system in a poor neighborhood. It has no administrative power to force it to do so, and must offer a cost sharing formula. Typically, this formula will be part of a

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contract that links the amount paid by the federal government to the characteristics of the sewage system that is built. If the costs of building the sewage system are better known to the local government than to the federal government, the former will be able to extract an informational rent. This informational rent is not only a transfer from one government level to another, it has efficiency costs: it order to reduce it the federal government will build a cost sharing formula that will induce the local government to choose a system that is not optimally dimensioned.

It is possible to show that the federal government of our example never looses anything by offering a contract of the following form: "Tell me everything you know that is relevant to the estimate of cost. As a function of what you tell me I will, according to a predetermined formula, transfer funds to you and order you to build a system of predetermined characteristics".

Furthermore, it is possible to choose a contract such that the local government will truthfully reveal its information. The equivalence of any cost sharing formula to one of these "revelation mechanisms" in which the informed party is given incentives to announce its information truthfully , is called the revelation principle.

The intuition behind this principle is that, given any initial contract, the federal government can calculate under what circumstances the local government would have incentives to misreport its information. It can then modify the contract so as to increase the transfers to which the local government would be eligible under these circumstances, so as to leave it no worse off if it tells the truth. The increased transfers which it must therefore implement are a necessary cost of the initial asymmetry of information, and cannot be

reduced by any strategic manipulation. The validity of the principle depends, however, on the assumption that the federal government knows enough about the payoffs of the local government to calculate its incentives for lying; even more importantly, it depends on the assumption that it has no difficulty committing itself to a truth-inducing contract. We shall discuss the limitations of these assumptions below, but shall concentrate for the moment on the theory's strengths.

Many variations on this theme are possible, of which one is specially relevant to our purposes. The revelation principle can easily be adapted to a situation where the construction of the sewage system extends over a long period of time and where the information becomes available to the local government progressively. Then, any contract between the two parties is equivalent to a contract in which the local government informs the federal government as soon as information becomes available.

The fact that any contract is equivalent to a revelation mechanism is an extremely useful technical tool. It also brings out in very stark form the limitations of the theory. The Constitution of the United States can be considered the founding contract of that country. Using contract theory to analyze the present, one would need to assume (implicitly) that the Founding Fathers had foreseen present conditions as one of the contingencies in the contract they drew up.

3.2   Implications for decentralization

In light of contract theory, the basic model that we have sketched above can be substantially modified. There is no reason to assume that the federal government will accept the fact that the information of the local government is not accessible. It can propose contracts (implicit or explicit) that ask the local governments to reveal their information and commit it to some actions as a function of this information. All the apparatus of contract theory can be used to study the end result.

A revelation mechanism need not only be interpreted as a contract signed between the federal government and the local governments. It can also be thought of as a system of taxation, where the tax is levied according to the observable actions and characteristics of the district. The same fundamental trade-off will be involved: efficiency requires large informational rents to the more fortunate districts. This makes a very strong case for performance based grants, though it also underlines that such grants may conflict with considerations of equity. The informational rents will not necessarily be allocated according to any normatively justifiable formula.

In order to limit informational rents, the federal government will find it desirable to accept inefficiencies. The service that the district provide will not be priced in such a way that marginal cost is equal to its social marginal value. It will only be for these districts who are the most efficient at providing the service that the equality will hold.

An example may help. In a country in which the federal government subcontracts to the local governments maintenance of the roads, the latter would try to exploit their superior

knowledge of local technical conditions and of the taste of the local population. They would have a tendency to overstate costs and benefits of additional maintenance. The theory tells us that they will be able to reap some advantage from this superior knowledge. Furthermore, in order to limit this advantage the federal government will accept that some inefficiencies creep into the system, and the direction of these inefficiencies can be predicted: there will be too little maintenance.

The rigour and clarity of the theory of revelation mechanisms has an associated cost. By appearing to suggest that a central government can, if it wishes, overcome the informational advantages of local government, it undermines the entire basis of the trade-off between information-gathering and the internalization of externalities that constituted the conventional wisdom as we characterized it in section 2. The conclusion might appear to be that centralization is always to be preferred to decentralization, but in fact the subversion of the traditional approach goes further than that. For if a central government can sign contracts with local governments, what is to prevent local governments from signing contracts with each other without the intermediation of a central authority at all?

3.3   Why do we need a central government in order to internalize externalities?

The management of river basins represents a typical example of decisions that one should expect to leave to levels above the local level (assuming, of course, that, as is usually the case, the river flows through many localities). Indeed there are strong externalities with the upstream localities able literally to dump their trash on the downstream localities. If this

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is the case, why can't the externality be resolved through direct negotiations between the localities themselves?

More generally, the conventional wisdom has generally assumed that we need an authority that can order subordinate units to limit negative externalities, or encourage them to produce more positive externalities. There is no explanation of why we cannot apply a version of the reasoning in the Coase theorem, which states that in the absence of negotiation costs, bargaining will lead to optimal outcomes. One may acknowledge that the Coase theorem is more seductive at the theoretical level than as guide to reality, and one cannot expect a totally satisfactory solution to this problem. However, without at least some thought given to the discrepancy between theoretical and practical intuition, it is difficult to provide guidelines on the circumstances in which it would be better to let districts negotiate between each other (see Gatsios & Seabright, 1989, and Jack, 1992, for discussions of this point).

So far, then, the application of contract theory to the analysis of decentralization has yielded a somewhat nihilistic conclusion. Not only has it shown that the supposed advantages of decentralization are not really advantages; it has also shown that the supposed disadvantages of decentralization are not really disadvantages. In consequence, without further refinement it implicitly makes it impossible to discuss the allocation of responsibilities among the different levels of government at all. For example, the literature contains arguments for the decentralization of secondary schools to local governments as well as arguments why it should be run at a regional or national level. How would we use standard contract theory to study these two situations? In both cases, contracts, implicit or explicit, would be signed, and some parties would benefit from informational rents due to their

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superior "time and place" knowledge. There would really be no reason to have very different outcomes in one case and the other. Even if the objectives of the regional and the local governments were different, they would presumably be drawn to bargain together in such a way that the terms of the contract would represent both of their objective functions. The main difference would be in the identification of the party responsible for paying the informational rents to the other.

The implication of this reasoning is that studying the imperfections of contractual bargaining is not just the result of a pedantic desire for a baroque modelling strategy. On the contrary, it is absolutely central to understanding the strengths and weaknesses of decentralization in government. If contractual bargaining worked perfectly, the extent of decentralization in government would be an irrelevance. In section 4, therefore, we discuss three important aspects of the imperfections of contractual bargaining that are of particular importance: the endogeneity of information acquisition, the incompleteness of contracts, and the possibility of renegotiation.

4.   Contract theory with imperfections in bargaining

4.1   The endogeneity of information acquisition

Both the conventional wisdom on decentralization and first-generation contract theory treated the allocation of information as exogeneous to the model. In reality the information possessed by agents depends on the cost of acquiring it and the cost of processing it, and

therefore on the incentives that they have to incur these costs. A good allocation of responsibilities should give the proper incentives to agents to incur these costs.

For instance, the control of politicians by the electorate depends crucially on the information that the electors have on the performance of the different government entities to which they belong. As we discuss below, the allocation of responsibilities among levels of government affects this acquisition of information, by increasing the value of the information to voters in their efforts to control politicians.

The neglect of this point can also lead to underestimation of the cost of citizen participation in the running of government and can lead to recommendations for the creation of overly complicated administrative structures, with each citizen belonging to a multiplicity of districts, one by each type of public good.

Closer attention to the endogeneity of information acquisition is the first step in understanding whether and to what extent local jurisdictions enjoy any kind of informational advantage over central ones. Let us begin with an example. Should a public transportation system in a provincial city be run by a local agency or by a branch of a national agency? The received wisdom would answer that it should. Externalities between cities are negligible, and hence the informational advantages of proximity dominate. Upon reflection though, it is difficult to understand what these informational advantages are. A national transportation agency could and presumably would employ representatives living in the city, who would have access to the same sources of information as the representatives of a local agency.

There seem to be two common reasons why local authorities are assumed to be better informed about local conditions than national ones. First, there is direct observation. Because

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local politicians and civil servants live in the district, they have direct access to information (quality of service, traffic problems) which is not available to individuals who live far away. Furthermore, the information that they do not gather directly can easily be provided by acquaintances, family members, or simple citizens who have easy access to them. Second, there are formal mechanisms. Governments often put in place formal procedures through which they collect information from their constituents: consultative assemblies, public hearings, advisory boards.

If local governments indeed have better information than central governments, it must be either because some of these techniques are available to them and not to the central goverment, or because they have better incentives to use them. However, it is clear that there is no reason why central government cannot use any of the techniques available to local government. Central governments do name representatives to local areas who collect information on their behalf (for instance, the French préfets); and they do use mechanisms by which citizens of a local area can express their views and provide information.

If anything, the balance of advantage as far as the availability of information gathering techniques is concerned probably lies with central government. There are economies of scope in the collection of information: a central agency which runs many transportation systems can transfer techniques acquired in one of them to the others at low cost; it can also afford to hire technicians in more specialized areas than can a local agency.

If central governments do not in fact use the techniques available to them as assiduously as local governments (a matter on which empirical evidence is unclear and which will differ according to the type of information in question), this must be because they have

less incentive to use them.[3] In the city transportation case, it will be because local politicians, who live among and are up for re-election by local citizens, have more incentive to listen to what those local citizens say. National politicians could find out if they wished to the views and opinions of local citizens; but they will have less incentive to take them seriously. Understanding why this is so depends critically on appreciating the significance of the incompleteness of political contracts.

4.2   The incompleteness of contracts

4.2.1 The notion of incompleteness

Whether in economic or in political life, a contract allocating responsibility to various parties for the accomplishment of certain tasks can never cover all the eventualities that may occur. This may be because the parties simply do not foresee all relevant eventualities; it will certainly be because the cost of writing contracts to cover them all would be prohibitive; and more subtly, some eventualities, though foreseeable and describable, could not be verified by any agency capable of enforcing the contract. For example, suppose the national government tried to sign an undertaking with the citizens of the provincial city to indemnify them financially if the performance of their transportation system were inadequate. Even in circumstances where the citizens and the government both knew perfectly well that the

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[3] Note that the higher incentive of local politicians to use local information does not imply that corruption may be a lesser problem in decentralized governments. In fact, corruption may actually become a more serious problem if increased access to information is not matched by increased accountability of local authorities.

performance of the system was inadequate, such a clause would be unenforceable.

Thanks to Coase's (1937) insight that a good theory of the firm had to be built on a precise description of the costs of transactions, theorists of the firm have long focused their attention on the difficulties of writing contracts. If one can write explicit contracts for the delivery of some goods and services, this transaction can be conducted between firms without any loss of efficiency. When explicit contracts have limitations, there might be place for internal organization.

The first formal model of incomplete contracts is the model of the employment relationship due to Simon (1951)[4]. Simon argued that an employer cannot predict accurately the tasks it would like a future employee to do; it is even impossible to write down explicitly a list of which tasks have to be accomplished under which circumstances. Under these conditions an employment contract specifies a salary and a set of tasks that the employer is allowed to ask the employee to do. Williamson (1975), who provided an essential link between this literature and the modern formal contracting literature, conducts a careful and exhaustive study of the difficulties of contracting.

Following Grossman and Hart (1986), this has been the subject of much recent work which shows that even relatively simple transactions necessitate very complex contracts. The sale of an airplane gives rise to a contract of several hundred pages. Redistribution of income among political districts necessitates formulae whose consequences are not always clearly anticipated by their designers. In practice, the complexity is reduced by writing contracts that do not discriminate as finely as ideally desirable between different circumstances. For

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[4] Alchian and Demsetz (1973) present counterarguments to the thesis of Simon.

instance, the proportion of the cost of a project to be paid by different levels of government will be dependent on the values of a subset of all the variables that economic theory would deem relevant. In practice it is important to discriminate between two types of variables:

1) those variables that depend on the actions of the parties. For instance, redistribution of funds between different areas should in principle depend on all the effort they make to provide services to the poorest segments of the population.

2) those variables that are exogeneous to the actions of the parties. For instance, redistribution should depend on the relative prices of a number of internationally traded goods which influence the economic well being of the poor or the cost of providing them with services.

In both cases we observe real-life arrangements that take into account only some of the many variables that are potentially relevant.

4.2.2 Implications for the theory of organizations

This renewal of contract theory has had powerful implications for the theory of organizations. If it is impossible to specify fully in a contract what actions should be taken by which party, the best the contract can do may be to decide which party has the discretion to take the relevant decision. In other words, contracts become less a matter of specifying particular actions and more a matter of allocating rights of control. By contrast, complete

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contracts would remove the need for discretion and thereby make redundant the notion of control.

The notion of control paves the way for decisions with a "0-1" or "yes-no" character in contract theory. This sheds light on issues of integration: organizations are or are not vertically integrated with each other. This type of sharp distinction is not easily available in standard contracting models.

The idea that parties to a contract will need to agree on allocations of control rights also helps to explain the power of incumbency in organizations. With a complete long term contract the only benefits of incumbency come from the accumulation of specific capital or other physical changes in the system. All the rents associated with these benefits can in general be extracted by the party who has the most bargaining power at the outset. With incomplete contracts, the situation changes. One must often leave some power ex-post to the agent, who may share in the rents associated with the contract even if there is no asymmetry of information.

4.2.3 Implications for the theory of decentralization

This insight can be applied to the problem of the difference between giving the right to control an agency to a local government or to a central goverment. The contract between the agency and its controlling body specifies certain actions that it must take, certain rights that it has, but also certain actions that the controlling government body is entitled to take. In order to understand the consequences of the contract, it is therefore crucial to understand the

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objectives of the controlling body, and hence to know its identity. So in the case of the city transportation authority, answering to a local controlling body will mean having its policy determined by strictly local considerations, which is desirable so long as spillover effects on and from other regions are small. Answering to a national controlling body would mean possibly benefitting from the national coordination of policy but also being run by those with many other priorities than the welfare of citizens of the city concerned. Centralization may be said therefore to improve coordination but reduce accountability.

Similarly, the contract between the electorate and a politician elected to office is very incomplete. The actions taken by the politician will depend on a number of factors, including the other tasks for which he is responsible. This is rather trite, but it is very difficult to integrate those considerations in a complete contract model, where the electorate can give sophisticated instructions to the politician and adjust precisely the reward to the action taken. Likewise, contracts between jurisdictions will be very incomplete, and there will consequently be limits to the extent to which externalities can be internalized purely by bargaining between jurisdictions.

A stylized model of political accountability that explicitly incorporates the incompleteness of contracts is presented in Seabright (1994). We describe the basic model in the Appendix and derive its fundamental relationships; for applications and versions that relax some of the more simplistic assumptions, the reader is referred to the original paper. Essentially it is a model in which voters seek to provide politicians with incentives to act in their interests. However, the "performance" of the politicians depends on factors that are not verifiable and cannot be made the subject of an explicit contract. Therefore the only way to

provide politicians with the right incentives is to give voters the power to eject them if they are dissatisfied.

Centralization in this model involves two features. Its advantage is that by allowing the central government to control more levers of policy it internalises any externalities between the regions. Its disadvantage is that any one region loses its ability to eject the government purely according to its own preferences; it faces the risk that in some circumstances a government will be re-elected whom it would have wished to eject, because of the preferences of other regions.

4.3   Renegotiation of contracts

A federal government promises support for the construction by a local government of an irrigation system if a certain number of conditions are met: a design made by a reputable engineering firm, a cost benefit analysis which proves the desirability of going ahead, and a public hearing of the users. The local government complies with the first two conditions, but not with the third, which it feels politically dangerous. If it has been smart enough to keep the design of the system within acceptable bounds it can, explicitly or implicitly, propose to the federal government the following deal: "Why don't you accept to fund the project, even though some conditions have not been met? You will be better off than if you did not fund it, and so would we". Under the general principle that bygones are bygones, the federal

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government should accept this deal[5]. The original contract is not "renegotiation proof". The awareness of this fact will weaken the incentives of the local government to respect the terms of the original agreement.

The general idea is straightforward: if during the execution of a contract it becomes clear that it can be modified to increase the utility of all the parties involved, the original contract will be modified at this point. Foreseeing this modification, the parties may modify their behavior in previous periods.

This has important policy consequences, and makes it possible to understand policy choices that seem mysterious. For instance, penalities for delay in large projects are often renegotiated away when the contractor is late. The expectation of this renegotiation encourages delay. However, this is often unavoidable. Once the project is late, the client will often prefer not to impose the penalty so as to keep carrots with which to encourage not too untimely completion (see Crémer and Seabright (1994, forthcoming)).

4.4   Unresolved issues

In the excitement of new discovery, it is easy to underestimate the number and importance of topics which are important on applied grounds and on which the literature has difficulty progressing. We mention four.

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[5] We are ignoring some important real world considerations, such as the desirability for the federal government to appear ``tough'' in possible subsequent negotiations.

<u>Dynamics and transitions</u>: We do not understand well the dynamics of organizations. There is informal evidence that transitions between one line of activity and another, between one industry and another, between one organizational form and another are difficult and require time. Analytical treatment of these phenomena is very difficult.

<u>The constitutional framework</u>: The contracts, implicit or explicit, that govern the life of an organization have different statuses. Some are more fundamental than others, rather as, in the legal realm, clauses of constitutions have a higher status and are more difficult to change than ordinary laws. This hierarchy of rules, important in private firms and even more so in governments, is poorly understood.

<u>Multidimensional uncertainty</u>: Most of current theory has been developed in settings where uncertainty bears on the value of one real variable. The extension to multidimensional uncertainty creates very difficult technical problems, and has been successfully completed only in very special cases. It is difficult to give precise advice on methods to circumvent the problem, but one should be aware of this fact when using the insights of the theory.

<u>Networks of contracts</u>: Recently a number of authors have stressed the fact that firms should be thought of as networks or nexuses of contracts or of treaties (see Crémer and Riordan, 1987; Aoki, Gustafson & Williamson, 1990). However, very little formal work has been done on the interrelationships between different contracts signed by the same agent. For instance, a provincial government will be party to contracts signed with the federal

government, with the districts at a lower level, with the unions representing its employees, implicitly with the voters, etc. We do not understand very well how these contracts interact with each other.

5. What is a jurisdiction and where should its boundaries lie?

Traditional micro economic theory takes the definition of the firm and its objectives as given. The theory of the firm began making substantial progress by asking the seemingly very abstract question: "what is a firm?" Even though the answers we have are still imperfect, the work done to find them has yielded lessons that have very concrete policy implications. It is therefore a reasonable strategy to try to ask the question: "what is a political jurisdiction?"

5.1 Coordination

One important aspect of the definition of the firm is that it groups together numerous types of activities. Similarly, if we are to develop a good understanding of political jurisdictions, we need to take seriously the notion that they integrate the power to make decisions in different domains. Indeed, jurisdictions can be thought of as organizations that group together the power to take political decisions, and we can ask what determines the grouping of activities by analogy with the grouping of activities within a firm.

Simon (1973) has argued that what determines the grouping of activities is the

necessity of coordination of activities in the short run. Crémer (1981) has analyzed formally this coordination. The following example, drawn from this paper, provides the necessary intuition.

The allocation of responsibilities for transportation within a country is usually done by mode of transportation. This seems to neglect the fundamental nature of the good. From the point of view of consumers, a plane trip between Paris and Lyons has more similarity with a train trip between the same two cities than with a plane trip between Paris and Toulouse. Yet, it is the two train trips that are the responsibility of the same agency, not the two trips between Paris and Lyons. Why is that? In the day to day management of the transportation system, the decisions to be taken are decisions that involve the planes and the crews that will flow between all towns. Very few short run decisions involve planes and trains at the same time. It is true that for planning purposes one should weigh carefully the options of plane and train transportation one against the other. These decisions are made in circumstances where time is not a crucial factor, and hence the extra difficulty of coordination between agencies is not very important.

For the management of infrastructure, this might have some important consequences. For instance, one could think that main irrigation channels could be, let us say, a provincial responsibility, whereas smaller branches could be a municipal responsibility. This can only be true in circumstances where there is no necessity to coordinate rapidly the management of the two parts of the system.

5.2 Control by voters

The theory of the firm has spent much energy trying to understand the mechanisms through which managers of corporations are controlled. Stockholders have bounded rationality, and both the acquisition of information and the exercice of the right to vote on corporate matters have relatively large costs. Furthermore, the benefits of any improvement in corporate performance generated by such activities are shared with all the other stockholders. It would seem therefore that corporations are undercontrolled. The mechanisms used to remedy this situation are of two kinds. First, the control of the day to day management of the firm can be delegated to specialists (i.e. the board of directors). Second, underperforming firms will be targets for takeovers if outsiders believe that they can run the firm in ways that increase its profits. There is general consensus that the question of control affects considerably the structure and the behavior of organizations.

Different forms of grouping together activities affect considerably the nature of the control that is exercised on political managers. First, relying on cooperation between layers of government often blurs responsibility for the execution of particular projects, and hence might have negative effects on efficiency. This is a common problem in water projects in some parts of Latin America for instance where coordination efforts become a highly time consuming part of project management. Second, even where responsibilities are separate it makes sense to divide them according to principles that are easy to remember. For example, allocating responsibility for different types of road to different levels of government sometimes results in difficulties in identifying who is in charge of what.

Because voters invest in information gathering about the performance of local governments, there is some organizational capital invested in the quality of participation in public life at different levels. For instance, in a system where municipal governments are powerful, voters will pay attention to the actions of the mayor, newspapers will develop sources in townhalls, and so on. Under these conditions there will be strong benefits to allocate new responsibilities to townhalls, rather than to weaker, and therefore less controlled, political entities. One can expect a certain stability of the allocation of power in the system.

If these intuitions resist further analysis, and if they are as important in practical terms as we suspect that they are, the consequences for the organization of the public sector are striking. Because one cannot determine the optimal level of government for specific tasks in isolation, it does not make sense to study the decentralization of decisions about infrastructure in isolation from the allocation of other public responsibilities. For instance, landfill managagement will be assigned to the municipalities, because they are responsible for garbage collection, and they are responsible for garbage collection because they have better information about the use of land, having gathered this information in order to collect property taxes.

Note that there is a cost to pushing too much responsibility onto one level of government. If the central government, for instance, is responsible for too many activities each of them will have relatively little weight in the decisions of the voters, and hence it will be easier to run some of them for private rather than public benefits.

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6.   Some Applications

6.1   The optimal size of a jurisdiction

Decentralization below the national level is relatively systematically promoted in the literature. Very often, one sees lists stating that this decision is to be taken at the federal level, this other at the state level, and yet another at the local level. Why would the efficiency criterion be a certain number of levels below the national level? Some countries have a smaller national population than states or municipalities in other countries. It would seem that population, or area, or some other measure of the services to be rendered would be a more logical criterion, and if this is the case, it does not make much sense to push decentralization on smaller countries.

On the other hand, the notion of control might help explain why the optimal number of levels might vary in such a way that the smaller district is larger in large countries than in smaller countries. The bounded rationality of voters prevents them from exercising adequate control over more than a certain number of governmental identities, a number which is independent of the size of the country.

6.2   Does decentralization promote democracy?

It is often argued that decentralization will promote democracy: local governments are more sensitive to local needs, hence an individual has more possibilities to influence.

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decisions that affect his life and his welfare under greater decentralization. This statement can be made more precise in two ways. First, under decentralization, there is a greater responsiveness of decisions with respect to the changes of preference of a single agent or group of similar agents. Second, under decentralization, there is a higher probability that a given agent or group of agents is pivotal, and hence determines the choice of a solution between two alternatives.

However, these generalizations will hold, if they do, only when all other factors are equal. In particular, it is important to notice that decentralization might lower the political power of the poorest citizens (see Seabright, 1994, section 3). Under decentralization, government will indeed be more sensitive to local needs, but it will still be local needs as perceived by the local political system. Hence, the groups that find it easier to organize political activity at the local level will be favored by decentralization. Organization of political forces is easier for groups where the benefits of influencing public policy is shared among a small number of agents. Groups that have more difficulty organizing will in general prefer larger political districts so that organizing is easier. Some political backing comes from the fact that political forces that have favored income equality have generally favored centralized governments.

6.3   Why should decentralization lead to more experimentation?

The argument is often made that decentralization promotes experimentation: free from the strictures of central administration, local governments can try out new ideas and methods.

Decentralization of decisions in water supply matters for instance has led Fortaleza in the North East of Brazil to adopt cheaper technological solutions such as community water pumps not yet tried in the South of the country where traditional large utilities have typically been the norm. The diversity of experiences in urban tranport in France or in India for instance also illustrates what municipalities can do when given the freedom to choose.

However, one must be careful with this argument. If the regions of the country are very different, it does indeed seem likely that local control will lead to more diversification. On the other hand, experimenting with a new technique creates positive externalities for other districts: they do not suffer the consequences of potential failures but benefit from the information generated.

It might seem that one could have the best of both worlds: use a decentralized system to benefit from local adaptation, and have the central government fund experimentation. But note that it is very difficult to write a contract that will indeed incite a district to experiment with a different institutional arrangements. It is difficult to define precisely what is the innovation; typically, institutional innovations are refined during implementation. It is also difficult to check whether it has indeed been implemented.

6.4   Decentralizing education

Seventy percent of French people believe that regional governments should be given more power in the financing and the management of schools; 60% believe that they should be given more power in the recruiting of teachers. On the other hand, only 30% call for a

greater role of regions in the development of curricula and 12% are willing to give the responsibility for the granting of diplomas[6]. It seems fair to summarize these results by saying that French people believe that programs and standards should be decided at the national level, but that schools should be managed locally. We should like to show that the desirability of such an allocation can be fruitfully analyzed using the conceptual framework sketched in this paper.

To consider the allocation of powers over the management of schools, we must first weigh externalities between localities and knowledge of local conditions. The externalities stem from migration: students trained in a district may go and spend their adult lives in another district, and therefore the social benefits of training are only partially enjoyed by the district of schooling. The national setting of the curriculum, and the verification through national exams that the curriculum is actually learned by the students, prevent free riding by districts. On the other hand, decentralizing the management of the schools allows for better adaptation to local tastes by a better setting of the dates of vacations, hiring of teachers who are sensitive to local culture, and so on.

This analysis, which draws entirely on the conventional wisdom on decentralization as we described it in section 2, has strong policy implications, some of which we do not believe would be generally accepted. For instance, below a certain degree of inter district migration, responsibility for curriculum and standards become the responsibility of regions. The analysis is also based on assumptions which seem difficult to defend. For instance, if tastes are

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[6] More precisely, 12% agree with the statement that "...les régions devraient pouvoir remplacer les diplômes nationaux par des diplômes régionaux". These statistics are taken from Le Monde de l'Education, Octobre 1993 (from poll conducted by SCP Communication of 858 persons, representative of the French population.

regionally differentiated for vacations and personality of teachers, why are they not regionally differentiated for curriculum and the organization of examinations?

Of course, all the elements sketched above are important in reality. However, we believe that an essential element of reality is missed if we do not think in more contractual terms. To use a contractual approach, we must first identify the fundamental contracting difficulties between the public and the school system. As a first approximation:

1) consumers of school services (parents and/or pupils) have good information about the pleasure that they derive from the school system (facilities, friendliness of teachers...).

2) on the other hand, they have poor information about the difficulty and the quality of the curriculum.

The separation of powers defined above provides a way to circumvent the second difficulty, while maintaining the advantages of control by consumers on the aspect they control best. On the aspects that the consumers understand best, power should be local because "voice" can be exerciced more easily at that level. On the other hand, it is very costly for the citizens to judge the appropriateness of locally set standards. There exist strong incentives for the local government to hide low standards in order to improve the perception of the quality of the education that is provided.

· By detaching the right of control over standards from the right of control over management of the school, one limits the incentives to tinker with standards. Comparison of

the results in national exams between different districts provides the basis for a fast judgment by citizens of the quality of their school districts.

A complete analysis would include many other factors:

1) a discussion of the burdens that changes of standards can impose of the districts and their non internalization by the national authority;

2) a discussion of the tension due to the fact that the consequences of neglect of the educational sector has consequences that may not be felt until after the next election;

3) a discussion of the reallocation of resources depending on the wealth of the districts.

Nevertheless, our analysis already has strong policy implications. In particular the desirability of the proposed organization does depend on a certain national homogeneity of tastes for curriculum, but not at all on the intensity of migration between districts.

6.5   Earmarking

In many East Asian and Latin American countries, earmarking is or has been a common of way for subnational governments to finance some of their major infrastructure expenditures and hence deserves a careful assessment in a discussion of decentralization. McCleary (1991) provides a useful survey of the arguments for and against earmarking of revenues. Defining earmarking as "the practice of assigning revenue — generally through

statute or constitutional clause — from specific taxes or groups of taxes to specific government activities or areas of activity", he develops a number of criteria that allow identification of the cases when it is justified. These criteria reflect the lessons of experience but some lessons from standard welfare economics. They can be revisited in the language of incomplete contracts.

6.5.1 Earmarking arises because of incomplete contracts

McCleary recognizes that earmarking is a second best solution: in the absence of imperfections in the government budgetary system it should not be used. For instance, in some countries taxes on fuels and vehicles are earmarked for a road construction fund. This practice has been defended as a mean to provide "more stable funding (that) would encourage competition". Translated into our framework, this argument goes as follows:

1) Entrepreneurs will enter the road construction industry only if they can be relatively confident that the government has a long run commitment to the building of roads so that they have a reasonable probability of recovering their investments.

2) The complete contract approach to this problem would have the government make a contract with entrepreneurs defining conditions under which roads would be built, the prices which would be paid, and the penalties that the government is willing to incurr if it does not pursue this program. Such contracts are not feasible.

3) Therefore, a second best approach is for the government to commit itself through a

second best, albeit imperfect contract: the resources coming from a specific source should go to a specific use.

This way of stating the problem allows a few refinements of McCleary's analysis. For instance, McCleary argues that "when money is tight, earmarked funds may be temporarily frozen (as happened in Ghana) or diverted to other uses (as in Mali), or the government and public entreprises may stop paying their fuel bills and hence fuel taxes (as they did in Zaire)". This shows that a commitment to earmarking is not fully credible; this might imply that earmarking cannot achieve what it sets out to achieve and that it would be better not to attempt it. However, it is also recognized that "the more reliable funding has made it easier to use private contractors through competitive bidding". Ex-ante, the earmarking was recognized by private entrepreneurs as a way to increase government commitment.

We believe that an approach that takes into account from the outset the fact that all contracts are incomplete should be able to weigh better the costs and benefits of earmarking. It does not work perfectly, because commitment to earmarking is sometimes reversible and because it potentially distorts government allocation of funds. But if we can understand exactly how and in what circumstances it increases the cost to government of reversing its expenditure commitments, this will help to quantify the benefits it can provide.

The incomplete contracts approach can also guard against certain misconceptions. For instance, McCleary argues that earmarking should only take place when there is "an appropriate investment program and a clear set of rules to regulate investment decisions, the mix of spending on capital, maintenance and rehabilitation, and administrative overheads"

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(ibid. p.102).

Notice that if there did exist a clear set of rules, and a credible investment program, there would be no need for earmarking. It would be possible to write a rather explicit set of rules that the government should follow. This approach seems to be in contradiction with the recognition that it is the difficulty of writing contracts that makes earmarking necessary.

To see this, let us use an example. Consider a country, such as Columbia, where the federal government has responsibility for road building but states have responsibility for maintenance. Presumably, the federal government has responsibility for the construction of roads because there are externalities and the state governments would not of their own volition build enough. If this is the case, left to their own they would also underinvest in maintenance. The federal government should therefore find some technique to encourage the local government to conduct more maintenance (we assume for the moment that state governments have a comparative advantage in maintenance, perhaps because local monitoring of road quality is easier).

If there were clear cut indicators of the quality of maintenance undertaken by state governments, the federal government could easily sign a contract with them linking a payment to the quantity and quality of the maintenance that had been done, as well as to factors over which they did not have control. It is because such indicators are not available that other techniques must be found. Earmarking may be one of them since it can be reasonable to order the local government to earmark all the receipts from local gasoline taxes and from tolls to maintenance. Its has the advantage of providing an automatic link between the usage of the transportation network and maintenance. It can also have a high opprtunity

cost in terms of other decentralized expenditure needs (education, health,...) when local resources constraints are important.

7. Concluding remarks

This paper has done no more than scratch the surface of a literature rich in both theoretical and practical insights. Its key messages are the following:

1) The modern theory of the firm provides many insights into political organization, for political jurisdictions can be thought of as pseudo-firms that provide services and which group together decision-making activities of various kinds.

2) Questions about decentralization in government are questions about the allocation of rights of control. If contractual relations were complete it would not matter whether power were decentralized or not, since contracts would specify everything to be done at each level of government and there would be no need for discretion.

3) The appropriate degree of decentralization depends upon which level of goverment will have the most incentive to act to bring about the desired outcomes. In particular, centralized governments can reap benefits of coordination, but tend to be less accountable than decentralized ones, though there are important exceptions to this

general rule.

4)   The organizational design of government affects not only incentives to take decisions but also incentives to gather the information on which those decisions will be based.

References

Akerlof, George A. 1970. "The Market for 'Lemons:' Quality Uncertainty and the Market Mechanism." *The Quarterly Journal of Economics*, 84:3, 488-500.

Aoki, M., B. Gustafsoon, and O.E. Williamson. 1990. *The Firm as a Nexus of Treaties*. London: European Stage.

Coase, Ronald. 1937. "The Nature of the Firm." *Economica*, 4, 386-405.

Crémer, Jacques. 1981. "A Partial Theory of the Optimal Organization of a Bureaucracy." *The Bell Journal of Economics*, 11:2, 683-93.

Crémer, Jacques. 1993. "Arm's Length Relationship." mimeo.

Crémer, Jacques. 1993. "A Theory of Vertical Integration Based on Monitoring Costs." mimeo, forthcoming.

Crémer, Jacques and Michael H. Riordan. 1987. "On Governing Multilateral Transactions with Bilateral Contracts." *Rand Journal of Economics*, 18:3, 436-51.

De Groot, Hans. 1988. "Decentralizing Decisions in Bureaucracies as a Principal-agent Problem." *Journal of Public Economics*, 37, 323-37.

Estache, Antonio and Kangbin Zeng. 1992. "Managing Pollution Control in Brazil: The Potential Use of Taxes and Fines by Federal and State Governments." World Bank Working Paper 929, Washington, D.C.: World Bank.

Grossman, Sandford J. and Oliver D. Hart. 1986. "The Costs and Benefits of Ownership: A Theory of Vertical and Lateral Integration." *Journal of Political Economy*, 94:4, 691-719.

Groves, Theodore. 1973. "Incentives in Teams." *Econometrics*, 31:6, 617-63.

Jack, William. 1992. "Power Sharing and Pollution Control: Coordinating Policies among Levels of Governments." World Bank Working Paper 887, Washington, D.C.: World Bank.

Lange, O. 1938. "On the Economic Theory of Socialism," in *On the Economic Theory of Socialism*. eds. O. Lange and F.M. Taylor, Minneapolis: University of Minnesota Press, 57-143.

McCleary, William. 1991. "The Earmarking of Government Revenue: A Review of Some World Bank Experience." *World Bank Research Observer*, 6:1, 81-104.

Oates, Wallace F. 1969. "The Effects of Property Taxes and Local Public Spending on Property Values: An Empirical Study of Tax Capitalization and Tiebout Hypothesis." *Journal of Political Economy*, 77:6 957-71.

Seabright, Paul. 1994. "Accountability and Decentralization in Government: An Incomplete Contracts Model." CEPR Discussion Paper 889.

Simon, Herbert A. 1973. "Applying Information Technology to Organization Design." *Public Administration* 33:3, 268-78.

Spence, Michael. 1973. "Job Market Signalling." *The Quarterly Journal of Economics*, 87:3, 561-72.

Weitzman, Martin L. 1974. "Prices Versus Quantities." *The Review of Economic Studies*, 41:4?, 477-91.

Appendix
Centralisation versus Decentralisation: a simple model

The model of this appendix is drawn from Seabright (1994). The population in a certain area is divided between two regions 1 and 2. The people will elect a government; this may be either a government for each region, or a single central government. After the election the governments have to implement a policy vector x: the regional governments would choose simultaneously the value of scalars $x1$ and $x2$ respectively, while a central government would choose both scalars. In this sense we can think of $x1$ as being the policy instrument of region 1, in that it is an instrument available to whichever authority governs region 1. Without loss of generality we assume that the welfare of the population in region 1 is strictly increasing in $x1$, and the welfare of the population in region 2 is strictly increasing in $x2$. The welfare of the population in region 1 may also depend positively or negatively on $x2$, and that in region 2 on the value of $x2$. To help intuition, where these externalities are positive we shall characterise the policies as "efficiency-enhancing", since policies that help one region also help the other; where they are negative we shall call them "redistributive", since policies that help one region are at the expense of the other.

The values of $x1$ and $x2$ chosen by the governments are not directly observable by the population but remain the private information of the government. The welfare of the population in each region, while observable by both the population and the government, is not verifiable; consequently the constitution cannot specify rewards or penalties for the government conditional on the welfare attained. By contrast, the externalities between regions are verifiable, and the constitution can make the assignment of powers conditional upon their magnitude. Note that the constitution may not make explicit reference to the magnitude of externalities, but may assign powers according to implicit judgments by the framers of the constitution about their magnitude. Alternatively, where externalities vary from case to case in ways that are verifiable the constitution may specify an allocation of powers explicitly contingent on their magnitude (see note 3 below).

The unobservability of government action matters in this model because higher values of $x1$ and $x2$ are costly for the governments (they involve "effort"). Indeed in this simple model we can interpret $x1$ and $x2$ directly as the levels of effort undertaken by the governments concerned. Since these levels are unobservable, governments must be induced to undertake such effort by the threat that they will not be re-elected if the populations are not satisfied with their levels of welfare. Re-election therefore has a value for them (the spoils of office), which we shall represent by W for the regional governments and αW for the central government. The value of not being re-elected is normalised to zero. The population's welfare is also, however, affected by additive but unobserved region-specific shocks $y1$ and $y2$; if their welfare net of these shocks falls short of some reservation level C (which can be interpreted as the welfare they might expect from a rival political party) they will wish to throw out the government. Regional governments will fail to be re-elected if the welfare level of the population in the region falls below C; a central government, however, will fail to be re-elected only if <u>both</u> regions' welfare falls below C.

Centralization in this model, therefore, involves two features. Its advantage is that by allowing the central government to control both x1 and x2 it internalises any externalities between the regions. Its disadvantage is that any one region loses its ability to eject the government purely according to its own preferences; it faces the risk that in some circumstances a government will be re-elected whom it would have wished to eject, because of the preferences of the other region (we could alternatively have assumed that it faced a risk that a government would be ejected whom it would have wished to re-elect, but nothing significant would be changed by assuming this).

The order of events is as follows:

1) A form of government (centralised or decentralised) is chosen.
2) The government(s) choose $\underline{x}$.
3) The region-specific shocks y1 and y2 are realised (but not observed by the populations).
4) The populations' welfare is realised and they decide whether to re-elect their government(s).

The welfare of region i is given by $Ui(x1,x2) + yi$, where Ui is strictly increasing and concave in xi, and concave in its other argument. For simplicity, we assume yi to be uniformly distributed with support [0,Yi], and we assume that this support (and the value of C) are such as to generate interior solutions.

The welfare of regional government Pi is given by $Vi(xi) + W$ if re-elected and $Vi(xi)$ if not re-elected, where Vi is strictly decreasing and concave. The welfare of national government E is given by $V(xi,x2) + \alpha W$ if re-elected and $V(x1,x2)$ if not. We assume that $dV(dxi)/dxi = dVi(xi)/dxi$; this is to ensure that neither form of government has an intrinsic advantage over the other arising from a differing marginal distutility of effort.

We can now compare the results under two different forms of government:

Regional Government

The government in each region i will choose xi to maximise

(2.1) $E [Vi(xi) + W]$

$= Vi(xi) + W.pr[Ui(x1,x2)+yi >= C]$

$= Vi(xi) + W.pr[yi >= C-Ui(x1,x2)]$

$= Vi(xi) + W(Yi+Ui(x1,x2)-C)/Yi$ for interior solutions, given the uniform distribution of yi.

The first order conditions for this problem are

(2.2) $- dV_i(x_i)/dx_i = (W/Y_i)(dU_i/dx_i)$

What this means is that the disutility of effort is equated to the value of staying in office multiplied by the marginal increase in probability of re-election. Note that V_i and Y_i need not be the same for each region; consequently the values of x_1 and x_2 chosen by the regional governments may not be the same.

Central Government

The central government E will choose x_1 and x_2 to maximise

(2.3) $E [V(x_1,x_2) + \alpha W]$.

$= V(x_1,x_2) + \alpha W.pr[U_1(x_1,x_2)+y_1 >= C$ or $U_2(x_1,x_2)+y_2 >= C]$

$= V(x_1,x_2) + \alpha W.(1-pr[U_1(x_1,x_2)+y_1 < C$ and $U_2(x_1,x_2)+y_2 < C])$

To simplify notation, denote by q_1 the event that $U_1(x_1,x_2)+y_1 < C$ and by q_2 the event that $U_2(x_1,x_2)+y_2 < C$. Then we can rewrite E's objective function as

(2.4) $V(x_1,x_2) + \alpha W.(1-pr(q_i).pr(q_j \mid q_i))$ for each i

$= V(x_1,x_2) + \alpha W.(1-pr(q_i).pr(q_j \mid q_i))$

$= V(x_1,x_2) + \alpha W.(1-((C-U_i(x_1,x_2))/Y_i).pr(q_j \mid q_i))$

The first order conditions for this problem are

(2.5) $- dV_i(x_i)/dx_i = (\alpha W/Y_i)(dU_i(x_i)/dx_i).pr(q_j \mid q_i)$
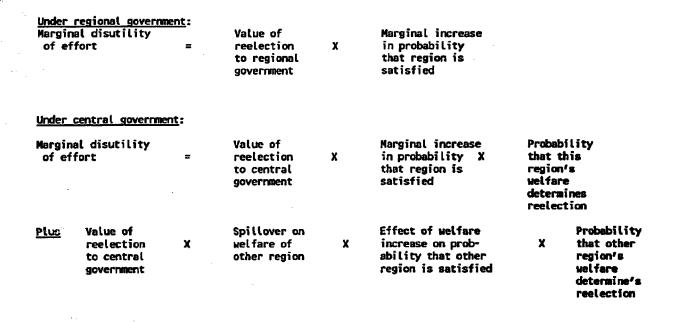$+ \alpha Wpr(q_i)(dU_j/dx_i)(dpr(q_j \mid q_i)/dU_j)$ for each i

And comparing this to equation (2.2) we can see what difference centralisation makes to the solution. The disutility of effort in implementing each policy instrument is under regional government set equal to the marginal increase in probability of re-election multiplied by the value of being re-elected. The probability of re-election is just the probability that the welfare of the population of the region concerned falls below its threshold level. Under central government this second term is multiplied by the probability that the welfare of the population of the other region falls below its threshold level, to reflect the fact that it takes both regions to be dissatisfied for the government to be ejected. Other things equal, this will lower the value of the right hand side of equation (2.5) and result in a lower effort by the government and a lower utility for the population; this is a direct consequence of the reduced

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accountability consequent upon centralisation. But now there are two other effects to take into account. One is due to the possibly greater incentive for effort due to greater spoils of office at national level (represented by the factor α). The second is represented by the second term on the right hand side of (2.5): the externality due to the impact of xi on region j's welfare has now been internalised. How much difference it makes to the government's effort will in turn depend on the difference it makes to the probability of re-election, which is precisely equal to the marginal increase in the probability that the population of region j are satisfied, conditional on the population of region i's being dissatisfied. And whether it increases or reduces the government's effort will depend, of course, on whether the externality was positive or negative in the first place.

If the latter two effects outweigh the first, a central government would make more effort to implement the policy instrument of region i than would regional governments. Whether the population of region i is better off as a consequence will depend, of course, on what happens to the effort the government makes to implement the instrument of region j, as well as on whether this has a positive or negative external impact on region i.

It is worth noting that, if each region's welfare were verifiable as well as being observable, the constitution could specify rewards and penalties conditional upon welfare, and the adverse impact of centralisation on accountability would disappear. Indeed, it is straightforward to see that, sicne there is no risk-effort trade-off in the model, such a constitution could always implement the first-best under either form of government.

We can summarise equations (2.2) and (2.5) in words:

Under regional government:

Marginal disutility of effort	=	Value of reelection to regional government	X	Marginal increase in probability that region is satisfied

Under central government:

Marginal disutility of effort	=	Value of reelection to central government	X	Marginal increase in probability that region is satisfied	X	Probability that this region's welfare determines reelection

Plus	Value of reelection to central government	X	Spillover on welfare of other region	X	Effect of welfare increase on probability that other region is satisfied	X	Probability that other region's welfare determine's reelection

What kinds of conclusion can be drawn from this analysis? We begin by considering

the simplest case where policies are efficiency-enhancing (so spillovers are positive and therefore increases in effort are unambiguously a good thing for both regions) and where the value of reelection is the same at regional and national level (so α is equal to one). Eight conclusions can be drawn, some obvious, some less so:

1)   First, the analysis confirms the basic intuition that the case for centralisation is strengthened if there are significant spillovers between regions. That is to say, the likelihood that centralisation will increase government effort and consequently population welfare is increased if spillovers are large.

2)   It also gives a precise sense to the notion that the cost of centralisation is a loss of local accountability. Here the loss of accountability is the fact that the welfare of a region now has a probability less than one of being the decisive factor in whether or not the government is reelected.

3)   A less obvious conclusion is that a positive correlation between region-specific shocks strengthens the case for centralisation. To see this, note that the probability that any region's welfare is decisive in whether or not the central government is re-elected is the probability that the other region is dissatisfied (since it takes two dissatisfied regions to eject a central government). But this is not an unconditional probability; rather it is the probability that the other region is dissatisfied, conditional on this region's being dissatisfied (that is, it is not $pr(qj)$ in equation (2.5) but $pr(qj \mid qi)$). And this conditional probability is higher the greater is the correlation between the shocks to the two regions. At the extreme, if the shocks are perfectly correlated, the risk that any region will find itself unable to eject a government with which it is satisfied because the other region is of a different view becomes negligible, and there is no loss of accountability in centralisation.

4)   Note that this does not at all the same thing as saying that regional similarity strengthens the case for centralisation. If differences between regions are incorporated in their different utility functions or the different distributions of their region-specific shocks (variables that are known to populations and governments before any decision are taken), then both regional and central governments are entirely capable of setting different values of $x1$ and $x2$ to reflect these differences. Centralisation makes neither easier nor more difficult the regional differentiation of policy. It is the degree of correlation of shocks (which are not observed by the populations) that affects the degree of centralisation. To put it another way, what weakens local accountability is not the risk that regions will require different policies; it is the risk that regions will be differentially satisfied with whatever policies they have.

5)   Centralisation may benefit some regions and not others. In particular, the magnitude of spillovers may vary between regions. In such circumstances the recipients of large spillovers from other regions are more likely to benefit from centralisation than are the recipients of small ones.

6)   The more "entrenched" governments are, in the sense that the more unlikely voters

are to wish to eject them, the stronger the case for regional as opposed to central government. This is because, if it is unlikely that one region will want to eject its government it is relatively even more unlikely that both regions will wish to, so the loss of accountability from centralisation is relatively great.

7)   The interest of citizens in one or other form of government is not necessarily shared by their political representatives. Regional politicians will lose, and central politicians gain, from centralisation, whatever the benefits to their citizens. Furthermore, if some politicians are potentially mobile, in the sense that they have a significant probability of forming the government under either central or regional arrangements, their incentives are perverse. They will have an interest in arguing for centralisation only when its impact in reducing accountability outweighs its beneficial impact on internalising spillovers, since under these circumstances the level of effort they have to undertake will be reduced.

8)   A choice between centralised and decentralised forms of government need not always be made once and for all, but can sometimes be undertaken on a case-be-case basis if it is possible to estimate some of the relevant variables (such as the size of the spillovers)[7].

We can now ask what would be the effect of relaxing the assumptions that $\alpha = 1$ and that spillovers are positive. It might seem natural to think that the value of re-election will always be greater under central than regional government, because central governments command larger resources generally, but it is important to distinguish between the value of initial election and the value of re-election. Former central politicians typically have a higher public profile and better alternative employment opportunities than former local politicians, and the value of re-election is measured relative to these alternative opportunities. Nevertheless, to the extent that α exceeds unity, the case for centralisation will be strengthened. If α is greater than the reciprocal of the term pr(qj | qi)) in equation (2.5), it may even happen that centralisation leads to higher government effort levels than decentralisation even without the internalisation of spillovers, because the greater desire of politicians for re-election outweighs their diminished accountability.

Taking into account the possibility of redistributive policies (those with negative spillovers) somewhat complicates the conclusions reached above. First of all, it is no longer true that higher levels of effort are always good for the welfare of populations. Taking externalities into account by centralisation may actually lower effort levels, and this may be desirable if they were previously above the efficient level (as they may have been through failing to take the externalities into account). If, however, effort was previously below the

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[7] A good example of this in practice is European Community merger control, where since 1990 the question whether the EC or member states have jurisidction over mergers has been settled with reference to the estimated magnitude of the spillovers between member states generated by the merger in question.

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efficient level (because, for example, W was too low to motivate politicians adequately), taking spillovers into account might paradoxically make both regions worse off. Region 1 could benefit from a reduction in the value of x2, but lose even more by a reduction in x1 consequent on the government's taking into account the spillover on region 2.

Secondly, if α is significantly greater than one, centralisation may increase the incentive for redistributive policies that harm some regions[8]. Suppose, for example, that high values of x1 impose large costs on region 2, but that the increased spoils from centralised power make the government's enthusiasm for pleasing region 1 outweigh its concern for region 2; it may then increase the value of x1 and make region 2 worse off. Such an outcome may seem extreme in this simple model, but it is evidently much more likely in circumstances where there are many regions, some of which enjoy positive and some suffer negative spillovers from the policies of region i. The increased incentive due to internalising the positive spillovers on the fortunate regions may outweigh the negative spillovers on the others, especially if these latter are unlikely to be the pivotal voters in the centralised system.

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[8] Note that this is not the same thing as saying that centralisation makes available certain redistributive policies that did not exist before, though the latter is certainly a very important phenomenon.

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