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Abstract

Contrary to a frequent contention, systems competition cannot work when governments respect the Subsidiarity Principle. The principle implies that governments step in where markets fail. Reintroducing markets through the backdoor of systems competition will again result in market failure. Three models are presented which illustrate this wisdom. The first is concerned with congestion-prone public goods and shows that fiscal competition may be ruinous for the governments. The second considers the insurance function of redistributive taxation and shows that systems competition may suffer from adverse selection. The third studies the role of quality regulation and shows that systems competition may be a competition of laxity resulting in inefficiently low quality standards.

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1. Introduction

Europe has dismantled its internal borders to grant the "four liberties" to its citizens and firms: Capital, services, labour and goods are now allowed to move freely across the borders. The new liberties will help to improve the allocation of resources and exploit the gains from trade, but they may also have noteworthy effects on the European nation states, because a period of intense systems competition has begun. Countries will compete for mobile factors of production and tax bases, perceiving strong pressures to reform their fiscal and regulatory intervention systems.

Whether this competition can be expected to be for the better or for the worse depends very much on the view of the state. Public choice theorists will welcome the possibility of taming Leviathan.[1] Public finance theorists, on the other hand, may fear that the competition will erode the basic functions of the state.

For the sake of argument, this paper adopts a Panglossian view of the state which is very much in the public finance tradition, at least in the German one as represented, for example, by Wagner (1876) and Timm (1961). The state is seen as a rational institution correcting market failure and acting in the interest of its citizens. Of course, this is a disputable way to approach the problem, but it is one that may serve as a useful benchmark in further discussions of the subject. The basic assumption is that governments carry out a selection of activities which cannot be provided efficiently through private competition and that they abstain from those areas in which private competition works. The name Subsidiarity Principle has been used to characterize this assumption.

It has often been argued that the Subsidiarity Principle implies that the new Europe should grow out of a competition between the existing nation states, that no central government is needed and that it is not even desirable to harmonize its fiscal and regulatory systems. This paper comes to the opposite conclusion. It will be shown that systems competition will fail if the Subsidiarity Principle is valid. Since governments stepped in where the market failed, a reintroduction of the market through the backdoor of systems competition cannot work. It is likely to bring about the same kind of market failure that justified the

[1]However, even with a Leviathan view of the state, favourable implications of tax competition are far from being self-evident. See Edwards and Keen (1994).

government intervention in the first place. This confirms the fears expressed by authors like R. Musgrave (1969), Oates (1972) or P. Musgrave (1991).

The paper will discuss three examples relevant to the Subsidiarity Principle. The first concerns public goods. Public goods cannot easily be produced privately since increasing returns in the provision of these goods implies ruinous competition. The problem of ruinous competition will be shown to reappear when states rather than firms compete with each other. The analysis will include both pure and impure public goods to allow for a motive to introduce taxes on mobile factors of production.

The next example refers to the insurance market. A person's income is a random walk through the course of his life. At birth, or even before birth, a veil of ignorance still covers the person's innate abilities and the abilities to be acquired through education. Governments can therefore provide parents with insurance against their children's risk of liftetime careers by implementing a system of redistributive taxation. By way of contrast, private insurance agencies cannot cover these risks because they can only make contracts with adults. For adults, the veil of ignorance has been lifted so that adverse selection renders a private solution impossible. It will be argued that the same kind of adverse selection problem that excluded private solutions in the first place will reappear on the level of public insurance if free migration between the states is feasible; i.e., if the states are subject to systems competition.

The third and final example discussed in this paper refers to the lemon problem. When buyers know less about the quality of the products consumed than the producers do, market equilibrium will bring about lower qualities than people would like. To overcome the inefficiency rational governments may intervene by detailing minimum quality standards in their consumer protection legislations. In the new Europe, the Cassis-de-Dijon principle, according to which a product that is legally produced in one country can be freely exported to any other country, will reintroduce the lemon problem through the back door. If consumers are unable to distinguish 15 different national quality standards per product, there will be a tendency for the single states to undercut their rivals' standards to give their own industries a competitive advantage. The result is that Europe settles to an equilibrium where the quality standards chosen are inefficiently low.

2. Public Goods, Congestion Charges and Systems Competition

The discussion begins by studying the role of fiscal competition for the provision of public goods. It is an old fear that fiscal competition will erode a country's tax bases and make it difficult for the governments to collect the taxes needed to finance the provision of public goods (Oates 1972, Wilson 1986, Zodrow and Mieszkowski 1986). On the other hand, some economists argue that fiscal competition induces governments to impose benefit taxes on the mobile factors of production in exchange for the public infrastructure provided. The benefit taxes, it is maintained, will generate the revenue needed to allow an efficient supply of infrastructure (Gerber and Hewitt 1987, Wellisch 1995). It seems fair to say that the matter has not yet been fully clarified. Let us see which answers the Subsidiarity Principle will provide.

To find an answer it is important to properly model the case of public goods in the narrower sense of the word. Usually, public goods are characterized either by no rivalry or by less than perfect rivalry in consumption. This criterion is often neglected in the literature on tax competition. It will be shown that the degree of rivalry is crucial for the question of whether or not fiscal competition can be expected to work.

The model used includes the cases of pure and impure public goods. In general, the quality of a public good has two dimensions: the capacity of the facility provided, W, and the number of uses, K. To fix ideas think of a highway. The width of the highway is W and the number of cars passing along it in a given period of time is K.[2] There is a unit capacity cost ρ and an individual (or average) congestion cost c, but there is no production cost directly related to the number of uses. The congestion cost is an increasing function of K and a decreasing function of W: $c = c(K,W), c_K \geq 0, c_W < 0$. In the case $c_K = 0$ the good is a pure public good in the Musgrave-Samuelson sense without any rivalry in consumption, in the case $c_K > 0$ it is an impure public good with more or less pronounced rivalry, depending on the level of c_K.

[2]See Mohring and Harwitz (1962) for an explicit model of highway congestion and Oakland (1972) for an application of this model to the theory of public goods. Boadway (1980) extends the model to the theory of club goods.

Suppose that the public good is an intermediate good which complements a mobile factor of production, say capital, which, together with another factor, say labour, is used for the production of some final good. Assume that the number of uses of the intermediate public good, K, is equal to the amount of capital invested and denote the amount of labour L. The production function for the final good, $f(K,L)$, is linearly homogenous and well behaved.

The country considered is small and behaves competitively in the international capital market where it faces a given net-of-tax rate of interest r. Due to a lack of international cooperation, only source taxes on capital and, possibly, a wage tax are available. Assume for a moment that labour is not internationally mobile and is inelastically supplied. Domestic residents own some given endowment of capital, $\overline{K}$, which they may or may not supply to the domestic market.

When the government charges a source tax at rate τ, capital is invested up to the point where its marginal product equals the sum of the marginal interest, congestion and tax cost:

(1) $$f_K(K,L) = r + c(K,W) + \tau \ .$$

Knowing this, the government choses τ and W so as to maximize the rent, R, that accrues to domestic residents. R equals the sum of labour income, capital income, and the revenue of the source tax on capital minus the cost of providing the public facility:

(2) $$R = (f - f_K \cdot K) + r\overline{K} + \tau K - \rho W \ .$$

It is assumed with this formulation that any difference between ρW and τK that may occur is absorbed by a tax imposed on, or a subsidy given to, the domestic residents. If (1) is used, this expression can be transformed to

(3) $$R = f(K,L) - r(K - \overline{K}) - c(K,W)K - \rho W \ .$$

Thus the rent accruing to domestic residents equals the country's domestic product net of the interest cost of the imported capital, the congestion cost and the cost of providing the public infrastructure.

Since (1) implies that K is a monotonically declining function of τ, an equivalent version of the government's optimization problem is the maximization of (3) with regard to K and W. The first-order conditions are

(4) $$f_K = r + c + c_K \cdot K$$

and

(5) $$-c_W \cdot K = \rho \ .$$

Equation (4) equates the marginal product of capital with its social cost, where the social cost of capital is the sum of the interest cost and the congestion cost. The congestion cost equals the individual congestion cost as perceived by each user of the public facility, c, plus the crowding externality which one additional user imposes on all other users, $c_K \cdot K$. Equation (5) is the Samuelson condition for the provision of public goods. Increasing the capacity of the facility by one unit reduces the individual congestion cost by c_W and will thus increase capital's "willingness to pay" for the public good by the same amount. Summing up the marginal willingness to pay for a capacity increase over all units of capital and equating this sum to the marginal cost of capacity gives equation (5).

Comparing (1) and (4) shows that the government chooses a source tax rate that equals the marginal crowding externality:

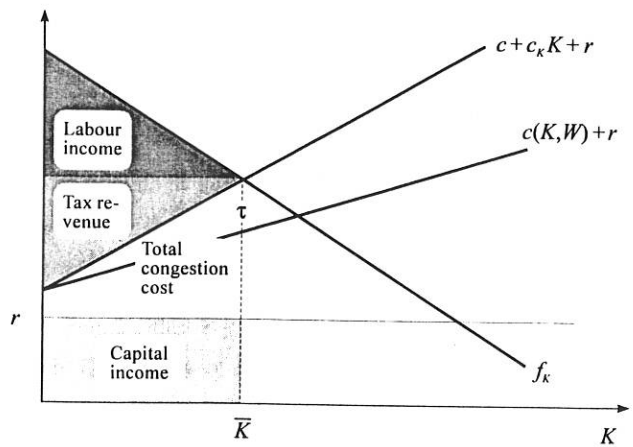
(6) $$\tau = c_K \cdot K.$$

This is the case of efficient benefit taxation which the advocates of fiscal competition seem to have in mind.

The choice of the optimal tax rate is illustrated in Figure 1. It is assumed that there is a symmetrical equilibrium in tax competition where the country considered owns the same

amount of capital as it invests; i.e., where $K = \overline{K}$. The figure shows the individual (or average) congestion cost function $c(K,W)$ and the social marginal congestion cost function $c + c_K K$. The white area between the latter and the horizontal line of height r is the total congestion cost and the shaded triangle above it is the tax revenue.[3] The other two shaded areas characterize the factor incomes. Given the capital income and given the capacity of the public facility, W, the government wants to choose τ or K so as to maximize the sum of labour income and tax revenue. Obviously, this is the case when τ equals the marginal crowding externality $c_K \cdot K$.

Figure 1. *The optimal benefit tax*



The crucial question is whether the revenue generated by the optimal benefit tax is large enough to cover the cost of providing the public facility. In the case of pure public goods $c_K = 0$, and it follows from (6) that $\tau = 0$. The optimal benefit tax is zero and the government does not collect any revenue from capital taxation. There is a fiscal deficit equal to the cost of providing the public good which has to be covered from other sources.

[3]To see this note that $\tau K = (\tau + c)K - Kc = (\tau + c)K - \int_0^K [c(u,W) + c_u(u,W)u]\,\mathrm{d}u$.

However, public goods are rarely pure public goods in the Musgrave-Samuelson sense. Typically there is a congestion problem, and perhaps the optimal congestion charge will generate enough revenue. It follows from Euler's theorem that

$$c_K \cdot K + c_W \cdot W = \lambda c \tag{7}$$

where λ is the degree of homogeneity of the congestion cost function. Inserting the first order conditions (5) and (6) into (7) gives

$$\tau K = \rho W + \lambda c K\,. \tag{8}$$

Equation (8) shows that the government will be able to recover the cost of providing the intermediate public good if, and only if, $\lambda \geq 0$; i.e., if the congestion cost function has a degree of homogeneity of no less than zero. Doubling both the number of customers and the expenditure for the public good must not result in lower individual congestion costs or, equivalently, doubling the number of customers must require a doubling, or more than a doubling, of the public expenditure for the congestion cost to stay constant. This is a variant of the usual exclusion of increasing returns to scale in a competitive market equilibrium.[4]

If the Subsidiarity Principle is valid there is little hope that cost recovery is possible, because all those public goods for which $\lambda \geq 0$ holds would be privately supplied, and the government would specialize exclusively on public goods with $\lambda < 0$.

It is easy to show that a competitive private market solution is possible if, and only if $\lambda \geq 0$. Suppose there are $i = 1, \ldots, n$ identical private clubs that offer the public facility at the respective user charges $\tau_1, \ldots, \tau_n$. In a competitive equilibrium the users are indifferent between the clubs supplying the facilities.[5] The sum, P, of the user charge τ_i and the congestion cost $c(K_i, W_i)$ must therefore be the same for all clubs:

[4]Bewley (1981) criticized Tiebout (1961) for neglecting the role of increasing returns to scale. The present model can be seen as an extension of Bewley's criticism to the case of congested public goods.

[5]Cf. Buchanan's (1965) seminal work on club goods and the overview of the literature given by Sandler and Tschirhart (1980).

(9) $$P \equiv \tau_i + c(K_i, W_i) = \tau_j + c(K_j, W_j) \quad \forall\, i, j = 1, \ldots, n.$$

The single club takes P as given and choses K_i and W_i so as to maximize its profit:

$$\max_{K_i, W_i} \quad [P - c(K_i, W_i)]K_i - \rho W_i.$$

Necessary conditions for an interior optimum are

(10) $$-c_W \; K_i = \rho$$

and

(11) $$\tau_i = c_K \; K_i.$$

They fully parallel conditions (5) and (6). The private club, too, charges a fee that incorporates the crowding externality and it provides a capacity that satisfies the Samuelson condition for the optimal provision of public goods. Since an application of Euler's theorem again implies an equation like (8), it follows that competitive private markets require $\lambda \geq 0$ as contended. If $\lambda < 0$, there were ruinous competition. Given the number of uses, K, the best a club could do is choose a capacity according to (10). And given the capacity, W, the best it could do is charge a fee according to (11). However, neither policy permits the club to avoid bankruptcy. This completes the proof that the Subsidiarity Principle implies $\lambda < 0$ for the government sector and that a fiscal deficit is unavoidable.

Governments cannot go bankrupt as easily as private firms can. The fiscal deficit can, in principle, be financed by taxing the fixed factor – labour in the present case. Indeed attracting capital at "dumping" prices would be optimal from the worker's point of view even if they had to sacrifice some of their wage income provided only that the fiscal deficit is less than this income. Nevertheless the distributional consequences will be far from trivial, and a substantial resistence from the disadvantaged workers must be feared.

Particularly severe consequences are to be expected when labour, too, finds ways to escape the tax burden. It is true that currently European workers are far from being perfectly

mobile, but things may change in the long run. To see in which direction increased mobility might ultimately lead, consider the limiting case of perfect mobility and suppose each country carries out a policy that maximizes the rent accruing to its initial population assuming that this population is entitled to receive the government budget surplus if any. Let the initial population be $\overline{L}$, while L is the total work force consisting of the initial population and immigrants, $L - \overline{L}$. Workers will face a given net-of-tax wage rate l in the community. When the national labour tax rate is σ, their employment will satisfy the condition

(12) $$f_L(K, L) = l + \sigma.$$

Instead of (3) the government is now maximizing

(13) $$R = f(K, L) - r\left(K - \overline{K}\right) - l\left(L - \overline{L}\right) - c(K, W)K - \rho W$$

by chosing K, L and W. Again (4) and (5) are necessary conditions for an optimum as before. However, an additional necessary condition is

(14) $$f_L(K, L) = l$$

which, because of (12) implies that $\sigma = 0$. Since equations (6) - (8) remain valid and $\lambda < 0$ holds due to the Subsidiarity Principle, it follows that there is a fiscal deficit that cannot be covered. Obviously, a competitive equilibrium fails to exist, and it does so for the same reason that makes a private competitive equilibrium infeasible when $\lambda < 0$; i.e., when there are increasing returns in production.

It is difficult to theorize about what will happen instead of the emergence of a competitive equilibrium. However the analogy with private markets suggests that there will be a ruinous competition of states, leading ultimately to a concentration of economic activities in one or only a few countries which will then no longer be forced to act competitively.

There are a number of remarks that are appropriate to qualify this theoretical result. They include the role of other fixed factors, the mobility assumption, the introduction of further public goods that benefit the workers or the assumption of competitive behaviour. However, instead of pursuing them here, let us rather turn to the next example for the Subsidiarity Principle.

3. Redistribution, Insurance and Fiscal Competition

The second important fiscal activity of the state in addition to the production of public goods is the redistribution of incomes. Redistribution can have many reasons including charity, social and political stabilization, or ethics and justice.

Arguably the most important reason is the insurance it provides in an uncertain world. Redistribution and insurance are two sides of the same coin, their difference lies primarily in the time of judgement. Ex post, every insurance contract involves redistribution. Ex ante, before the dice of destiny are cast, much of the foreseen or announced redistribution can be seen as insurance against the risk of income variations. Many authors including Friedman (1953), Harsanyi (1953) and Rawls (1971) have pointed this out.

Given that there are private insurance markets that offer protection against risk, the crucial question is which borderline the Subsidiarity Principle draws between government and private insurance. Why are risk markets imperfect and to what extent can governments do better than the market?

The literature has distinguished two basic reasons for market failure in insurance. The first is moral hazard. There can be moral hazard due to a reduction in care (ex ante moral hazard) and due to an excessive demand for indemnification resources (ex post moral hazard). Writers like Spence and Zeckhauser (1971) and Pauly (1968) have analyzed the problems involved. Apart from Arnott and Stiglitz's (1989) suggestion of taxing the consumption of dangerous commodities like tobacco or alcohol, moral hazard in the insurance context hardly justifies government intervention. The government would have to know more about the behaviour of the insurees than the insurance companies to overcome the asymmetric information causing the moral hazard problem.

This is different with the second reason for market failure, adverse selection (see Pauly 1974, Rothschild and Stiglitz 1976, Wilson 1979 or Eisen 1979). When insurance companies cannot distinguish between good and bad risks, but the potential insurees can, the good risks will not find a pooling insurance contract attractive because they know that they would have to subsidize the bad risks with their premium.[6] The typical result is a breakdown of the insurance market for the good risks and, with a continuum of different types of risks in the market, even a market for bad risks may never come to an existence (Riley 1979).

Unlike moral hazard, the government can correct the market failure due to adverse selection because it does not need any superior information. In many cases it can provide welfare improvements simply by making the insurance or redistribution obligatory.

The main reason for this possibility is that the government can introduce the insurance earlier, at a stage when no one knows who will be the good or the bad risks. Government redistribution is an insurance against being a bad risk and as such it may be welcomed by all citizens before destiny has lifted its veil of ignorance.

To be more specific, consider the preferences of parents or parents to be. At or before the time of birth the parents do not know whether their child will be handicapped or healthy, gifted or untalented. They are therefore interested in obtaining insurance against the lifetime income variation resulting from these differences. The market cannot provide this insurance since this would imply that the parents sign a bondage contract for their children from which these children could not escape even if they wished to do so. Whether the absence of bondage is a market failure or the result of a government intervention that requires another intervention to patch the consequences can be left open here. The course of history has long made its decision about the matter and given this decision, there is little doubt that private markets cannot provide the type of career insurance which is the essence of income redistribution through the government budget.

Private insurance markets simply come too late. The "children" have to be adults to obtain insurance, but then their differences are already visible. If both the insurer and the potential insurees can monitor the differences, they will never agree to a contract that

[6]When the insurance companies enjoy market power, separating equilibria with variable premia are possible. This paper is only concerned with competitive solutions.

eliminates them, and if only the insurees can, insurance markets may not come into existence because of the adverse selection described.[7]

The impossibility of signing bondage contracts on behalf of one's children explains the borderline between private and government insurance. The redistributive tax system provides insurance against a bad endowment with innate abilities and bad luck during growth towards adulthood including the severe lifetime consequences this may have. The private insurance markets cover some of the minor risks that remain.

Consider a simple insurance model that illustrates some of the problems involved. Suppose for a moment that the economy considered is closed and assume again that output is produced with capital, K, and labour, L, where L is measured in terms of efficiency units of labour rather than real persons. As before, $f(K,L)$ is the linear-homogenous production function. The wage of an efficiency unit of labour equals its marginal product,

$$l = f_L(K,L), \tag{15}$$

and the rate of interest equals the marginal product of capital,

$$r = f_K(K,L). \tag{16}$$

Let the number of efficiency units supplied by one worker be $\theta_1 \cdot \theta_2$ where θ_1 and θ_2 are arbitrarily random variables with a mean of one: $E\theta_1 = E\theta_2 = 1$. θ_1 is the risk arising from innate abilities that become known only at the beginning of adulthood and θ_2 reflects later reasons for wage variations such as promotion, employment or health risks. Assume that the θ's are stochastically independent across time and individuals, but are identically distributed for all individuals in the economy. If the economy is large, these assumptions imply that f_L, and hence l, is non-stochastic.

[7]For a related discussion of this theme see Sinn (1995b).

Assume that a worker faces an additional stochastically independent risk in terms of a random loss $C, C \geq 0$, which is deducted from his wage income. Moreover, let every worker own a capital endowment $\overline{K}$. Without taxation and market insurance, his total income will be

$$Y = \theta_1 \cdot \theta_2 \cdot l - C + r\overline{K}. \tag{17}$$

Obviously the risk involved in C is insurable since it is the same for all workers. Respecting the Subsidiarity Principle the government will therefore not include this risk in its redistribution policy. In a competitive private market fair insurance will be available at a premium $P = \alpha EC$ where α is the degree of coverage. A globally risk averse individual will chose a full coverage contract $(\alpha = 1)$, and equation (17) becomes

$$Y = \theta_1 \cdot \theta_2 \cdot l - EC + r\overline{K}. \tag{18}$$

Things are different with θ_1 and θ_2. As explained above, the riskiness of innate abilities, θ_1, cannot be privately insured since the contract can only be made after θ_1 has become known to at least one of the parties. The contract would involve a known resource transfer from one part of the society to another to which the net contributors of funds would never agree.

θ_2 may also not be insurable. θ_2 is a multiplicative factor for θ_1 which augments the differences in innate abilities adding more randomness at a later period of time. Insurance is possible if the realization of θ_1 is visible to both parties because the premium can then be conditioned on the value of θ_1. However, if only the workers know their type while the insurance companies cannot distinguish between them, there is the typical adverse selection problem.

Because of the stochastic independence of θ_1 across the workers, the realized distribution of θ_1 is identical with the probability distribution of θ_1 as seen from an ex ante perspective. If θ_1 has a small, and θ_2 a large, variance adverse selection is not very strong and a private insurance solution, albeit with less than full coverage for the better risks, is possible.