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Economic Models of Policy-Making in
Interdependent Economies: An Alternative
View on Competition Among Policies

by

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The Kiel Institute of World Economics

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Abstract

This paper presents an alternative view on the appropriateness of international policy coordination. Policy-makers compete for internationally mobile capital by offering club goods which are used as input factors by firms. A country is attractive for internationally mobile capital if the price for investing there (tax rate on capital) and the quality of the club goods offered lead to higher profits than elsewhere. Because there are no spill-overs from national policy-making, policy coordination offers no gains to the benevolent politician. If policy-makers are of the Leviathan-type, international policy coordination offers the chance to escape restraints that the exit mechanism of capital flight imposes upon this behaviour. Evidence on inflation and money stock trends before and after the collapse of the Bretton Woods-System serves to illustrate some of the theoretical concepts.

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Contents

Page

I.	Economic Policy-Making in Interdependent Nations: The Standard View and an Alternative	1
II.	The Alternative View: Competition for Capital	6
II.1.	Building Blocks	6
II.2.	The Competitive Process	10
II.3.	International Coordination of Policies	16
II.4.	A Historical Example: Money Supply and Inflation Rates after 1973	20
III.	A Closer Look at the Assumptions of the Alternative View	24
III.1.	Behaviour of Entrepreneurs: How Mobile is International Capital?	24
III.2.	Does Government Activity Matter?	27
III.3.	Tax Competition	28
IV.	Conclusions	30
	Bibliography	32

I. Economic Policy-Making in Interdependent Nations: The Standard View and an Alternative

The proposition that in nations linked by trade and by capital movements economic policies should be coordinated rather than competitive has gained widespread support among economists and politicians.¹ Its rationale is based on a Keynesian model of interdependent nations and a game-theoretic framework describing the targets and the behaviour of each country's politicians. The message of the Keynesian model is simple: employment and output are demand-determined. Demand may not be sufficient to guarantee full employment. Governments can create additional demand with expansionary fiscal and monetary policy. However, if the economy is sufficiently open and small, some of the demand expansion will end up outside the country as domestic consumers spend their additional income on imports. From a Keynesian point of view this constitutes an output gain foregone for the individual country, but not for the world as a whole. National governments' single-handed attempts to raise employment at home are thus partially foiled by the spill-over of demand into other countries.²

The game-theoretic framework adds to this result assumptions on the behaviour of politicians. Since jobs created abroad do not translate into additional votes, governments will from a certain point onward abstain from additional, single-

¹ Cf. Cooper (1985), Horne, Masson (1988) and Frenkel, Goldstein, Masson (1988) for summaries of earlier and more recent work in this area.

² It should be stressed that this scenario of a "locomotive world" is only one possible example supporting the case for international policy coordination. The same conclusion can be arrived at in a model where domestic policy measures harm foreign countries, i.e. a "beggar-thy-neighbour-world". For an elaboration of this point cf. Martinez Oliva (1987).

handed expansionary measures because the costs of such measures (e.g. increases in inflation) are not covered by benefits to citizens of their own country. If each policy-maker were at this point assured that additional expansionary measures would be reciprocated abroad, employment could be increased further by a coordinated expansion leading to mutual spillovers. As long as such assurance is not granted (and this will be the case in the *absence* of policy coordination), each policy-maker refrains from further expansion, hoping to gain a free ride on the locomotive of other politicians' expansionary policy measures. In order to avoid the resulting suboptimal state in which policies everywhere are too restrictive, mutual assurance to adopt expansionary measures if the other does so, i.e. policy coordination, is needed.¹ To sum up, the pro-coordination-view based on the Keynesian model of interdependent nations and the game-theoretic framework makes a strong case for the international coordination of economic policies because each country is supposedly worse off in a world where policy-makers act independently in comparison to a world where policies are decided jointly.

The present paper aims to present a "German"² alternative to the Keynesian model of the world economy from which it differs in its emphasis on the role of capital accumulation for more growth and employment.³ Essentially, we view different locations (countries) of the world as competitors for internationally mobile resources. Each location is endowed with

¹ This position has been put forward e.g. in Drèze et al. (1987), p. 21-25.

² This label has recently been attached to a group of economists that reject the hypothesis that international economic policy coordination is beneficial. Cf. Frenkel, Goldstein, Masson (1988, p. 151), who rightly observe that the term is a slight misnomer.

³ We thus focus on *one* of the building-blocks of the pro-coordination-view, which can be criticized for a variety of other reasons. See Scheide and Sinn (1989).

stocks of immobile resources which determine the attractiveness of a particular location for the conduct of economic activities. Immobile resources are land and the natural resources embedded in it, human capital, the capital stock already in place, and a stock of economic policy decisions which determine the framework for business activities. The prime internationally mobile resource is malleable capital, i.e. financial capital or savings. While labour may also be regarded as internationally mobile, we abstract from this possibility throughout the paper.

The stock of economic policy decisions plays a crucial role as it determines the attractiveness of resident immobile factors for internationally mobile resources. For example, labour services may at a particular location be available at a wage near or below their marginal value product. They are therefore attractive for international investors. Nevertheless, a hostile attitude of the incumbent government towards foreign owners of capital renders resident immobile factors unemployable - not because their wage is too high but because the foreign investment complementary to local labour is expected to be expropriated once it has become invested in the country. This example illustrates the general principle that through the effect of their policies on the profitability of investment governments affect the worldwide allocation of capital. All governments therefore compete for financial capital and other internationally mobile resources. Note that this conclusion pertains not only to the attraction of inflows of resources from abroad but also to the retention of local resources. Governments compete for the savings of other countries' residents as well as for those of their own.

The change of emphasis from competition for scarce demand to competition for capital highlights the long-term aspects of economic growth. It seems appropriate for a situation where capital is the scarce factor needed to create more employ-

ment and output. It also gives rise to an unorthodox interpretation of what are now commonly called "current account imbalances". If countries with successful economic policies are seen as growth poles which attract capital, a positive balance on the capital account (net capital imports) and a negative balance on the trade account can no longer be regarded as a sign of a country "living beyond its means" but rather signal that it is successful in attracting capital goods from the rest of the world. Seen from the same angle, a country like West Germany whose large and persistent trade account surpluses are permanently being castigated in international fora, turns out to be a region whose residents find it more profitable to invest abroad rather than at home. In the long run such a tendency can be said to weaken the capital base of the West German economy. The label "World Champion in Exports" for the West German economy therefore acquires a hollow ring: German firms are supplying other locations with capital goods that could - under different government policies - have been invested in Germany. To sum up: If nations compete for capital, the focus shifts from trade in goods and services to the allocation of investment among the various locations of this world. In the words of Bertil Ohlin (1933, p. 307): "Instead of asking why certain countries exchange certain goods with one another, one can ask why production is divided between these countries in a certain way".

Our analysis which focusses on capital accumulation supports the view that economic policies should not be coordinated on an international scale. The main reason is that the benefits of policies improving the attractiveness of a location for investors are likely to accrue exclusively to residents of the country itself. Politicians thus have a strong incentive to implement them.¹ For example, an investor can only bene-

¹ Unless, of course, benefits take such a long time in making themselves felt that the implementing politicians are no longer in power.

fit from a change in the tax regime of a country if he invests there. A well-functioning legal and financial infrastructure can to a large extent only be used by residents who pay for its services with their taxes. Free-riding of other politicians is therefore considerably reduced. Within the demand-spillover-scenario, governments are seen as producers of goods that are public goods internationally. Within the competition-for-capital-scenario, on the other hand, governments produce local public goods that are private goods internationally.¹ In other words, governments produce club goods. Within a country, no one can be excluded from using the infrastructure or from benefiting from prudent macro-economic policies. On an international scale, exclusion is possible simply because the domain of national policies ends at the border of a country. The need for international policy coordination in the realm of macroeconomics in such a world is considerably reduced. Moreover, the call for coordinating policies within such a framework is equivalent to the formation of a cartel of clubs that will most likely raise the price of their product and limit its quantity. Another possible consequence may be a reduction of choice among different programs of economic policy for international investors. The paper elaborates on all these points. In part II. we present the competition-for-capital model in a more formal manner. Part III. takes a closer look at some of the assumptions of the model and points to areas of further research.

¹ Cf. Connolly (1970)'s elaboration of this point.

II. The Alternative View: Competition for Capital

II.1. Building blocks

Our model makes the following assumptions.

1. Attractiveness of a location for investors

In economic terms, a location is identically equal to the immobile factors of production that reside there. Immobile factors of production are land, labour, the stock of capital already invested at a location, and a stock of economic policy decisions that determine the framework for entrepreneurial activities (the present government's and its predecessors' track record). Internationally mobile resources are those that have not yet been devoted to any specific use and therefore may be employed where they are expected to yield the highest income. In this analysis we will focus on mobile capital in the form of savings. It should be kept in mind, however, that human capital is internationally mobile, too, provided it is not overly specific. Immobile factors depend on mobile factors of production: as long as savings continue to be invested at one particular location, resident factors of production can expect to earn additional income now and in the future. The decision of owners of mobile capital to invest at a particular location is guided by the profitability of investment there relative to that of investment at other locations which in turn depends on the price of local factors relative to their productivity at different locations.

We define locations to be nations and not regions or towns. One reason for doing so is the existence of governments whose policy domains are nations. Since the quality of the

stock of economic policy decisions applying to economic activities within one particular country affects the profitability of investment there in much the same manner as the quality of other immobile factors, it seems useful to focus on nations as locations of economic activity.¹ The second reason for focussing on nations rather than lower-tier jurisdictions is the fact that there are national monies which are linked by exchange rates. The existence of exchange rates grants immobile factors the possibility of rendering themselves more attractive to mobile savings by lowering their price in foreign currency without lowering their price in local currency, i.e. by engineering a real depreciation. We will not pursue the implications of flexible exchange rates in the present paper. The analysis is thus mainly applicable to a group of nations who have fixed exchange rates among themselves. The European countries in the last two years and - possibly - in the future may serve as an example for such a group.

2. Behaviour of entrepreneurs

Entrepreneurs choose among different investment locations at home and abroad with the aim of maximizing the present value of expected after-tax profits. Entrepreneurs invest the savings they receive through capital markets and other financial intermediaries in those locations where they are expected to yield the highest return. Expected after-tax profits depend on the marginal value product of labour and capital, the tax rate, and a stock of local club goods whose production is organized by the incumbent government and its predecessors. We assume that local club goods are used non-

¹ This is not to deny that there may be decisions taken at lower jurisdictional levels that affect the profitability of investment, e.g. community charges. Indeed a major part of the literature on tax competition among federal states of the United States is concerned with just that issue. We believe, however, that the macroeconomic framework is the more appropriate one if one wants to analyse the allocation of mobile capital among different nations.

rivalrously by resident firms as a factor of production and that the marginal value product of this stock of local public goods differs with each resident firm. Marginal profit of firm j in country i may thus be expressed as

$$\pi_i^j = p^j \cdot f^j(k, l, G_i) - w_i \cdot l - (t_i + r) \cdot k \quad (1)$$

where k and l are the additional, newly employed amounts of labour and capital, w_i the local wage, r the interest rate on the world capital market, t_i the local tax rate on newly employed capital, G_i the stock of local public goods, p^j the price of firm j 's product on the world market which is produced using technology $f^j(\cdot)$.

3. Behaviour of governments

We view governments as suppliers of club goods.¹ Two types of club goods may be distinguished: Type A serves as an input factor to private production activities, Type B is consumed by immobile factors in the form of subsidies and transfers. If entrepreneurs want to avail themselves of the benefits from Type A club goods, they have to invest within the jurisdiction of that particular government. Free-riding therefore is - to a large extent - excluded. Examples of Type A club goods are manifold: the maintenance of an economic order including e.g. the maintenance of a stable price level, the guarantee to enforce private contracts, and the provision of an open regime for international trade in goods and capital including the maintenance of convertibility for residents and non-residents. One may also include decisions to organize the provision of important infrastructure goods such as a telecommunications network and streets among Type A club goods. Note that this does not imply that the govern-

¹ Club goods are consumed non-rivalrously by a group of beneficiaries from which non-payers can be excluded. A typical example is the screening of a movie.

ment itself produces these goods. In many cases the actual provision of Type A club goods will be handled in a more efficient manner by private enterprises, who have acquired production licenses from the government. We assume that the most efficient division of labour for the production of local public goods - private or public enterprises - will be revealed by the trial-and-error process of competition for capital. Governments that have organized this division in a particular efficient manner may be imitated by less successful ones.

Governments differ in their ability to organize the production of local club goods. Some are more efficient than others and therefore are more successful in attracting internationally mobile resources. These governments either

- produce a given output of Type A club goods with a smaller amount of tax receipts than other governments (attractive membership fee) or
- supply Type A club goods that are more suited to the needs of the owners of mobile resources (attractive club good).

Governments finance the provision of local club goods by levying a tax on capital invested within their jurisdiction. We assume that governments aim to maximize the amount of transfers and subsidies (club good type B) by choosing the rate of capital taxation and the provision of local club goods. The rationale for this assumption on government behaviour is that governments expect the probability of reelection to increase with the amount of transfers and subsidies, S_i . From the budget constraint of the government it follows that S_i can be expressed as¹

$$S_i = t_i \cdot K_i(G_i, t_i) - s_i \cdot G_i \quad (2)$$

¹ We assume a balanced budget of the government throughout in the sense that the government does not run deficits which are financed by the private sector.

where K_i is the total capital stock invested within country i which we assume to be a negative function of the rate of capital taxation and a positive function of the amount of local public goods.¹ s_i are the unit costs of local public goods which the government pays to their producer.

II.2. The competitive process

Given these assumptions, one can picture a competitive process among the governments of different nations. Imagine a group of countries where barriers to cross-border flows of goods and financial capital are removed. Governments will then have to decide on the economic policies they plan to implement. In terms of our model, they have to set the rate of capital taxation and they have to organize the amount and quality of local club goods. We assume that in a first period after liberalization governments behave as if in monopolistic competition, i.e. they are as yet not aware of the economic consequences of the new open economic regime. In particular, they do not expect economic policies in other countries to influence the inflow of internationally mobile resources which they hope to attract. As a result, the expectations of some governments will be thwarted. In a second period after liberalization governments will have learned to live with the new system and will be aware of the repercussions of their own and other governments' policies on capital formation within their jurisdiction.

¹ Strictly speaking, in any one period it is only investment that is responsive to changes in G_i and t_i . The capital stock already in place is no longer mobile and cannot escape higher levels of taxation or lower levels of government output.

As monopolists, governments set their policy parameters (t_i and G_i) in period 1 by maximizing transfers S_i (equation (2)). The necessary conditions for a transfer maximum are

$$K_i + t_i \cdot dK_i/dt_i = 0 \quad (3)$$

and

$$t_i \cdot dK_i/dG_i - s_i = 0 \quad (4)$$

Equation (3) implies that a government will continue to raise the rate of capital taxation as long as the increase in government revenues from a marginal increase in the tax rate exceeds the loss in investment brought about by that marginal increase. Equation (4) implies that a government will continue to expand the provision of local public goods as long as the tax revenues generated by this expansion exceed the costs. Equation (3) implicitly defines an optimal rate of capital taxation, t_i^* , equation (4) does the same for the optimal amount of local club goods, G_i^* .

Once the decisions of all governments are known, capitalists compare marginal after-tax profits in all countries (including their current country of residence) that allow foreign capital to enter. The profit-maximizing investment k_i^{j*} and employment of labour l_i^{j*} of firm j in country i are implicitly given by

$$p^j \cdot \frac{df^j(k, l, G_i^*)}{dk} = t_i^* + r \quad (5)$$

and

$$p^j \cdot \frac{df^j(k, l, G_i^*)}{dl} = w_i \quad (6)$$

The highest marginal profit that firm j can obtain in country i , π_i^{j*} , may then be calculated by substituting k_i^{j*} , l_i^{j*} ,

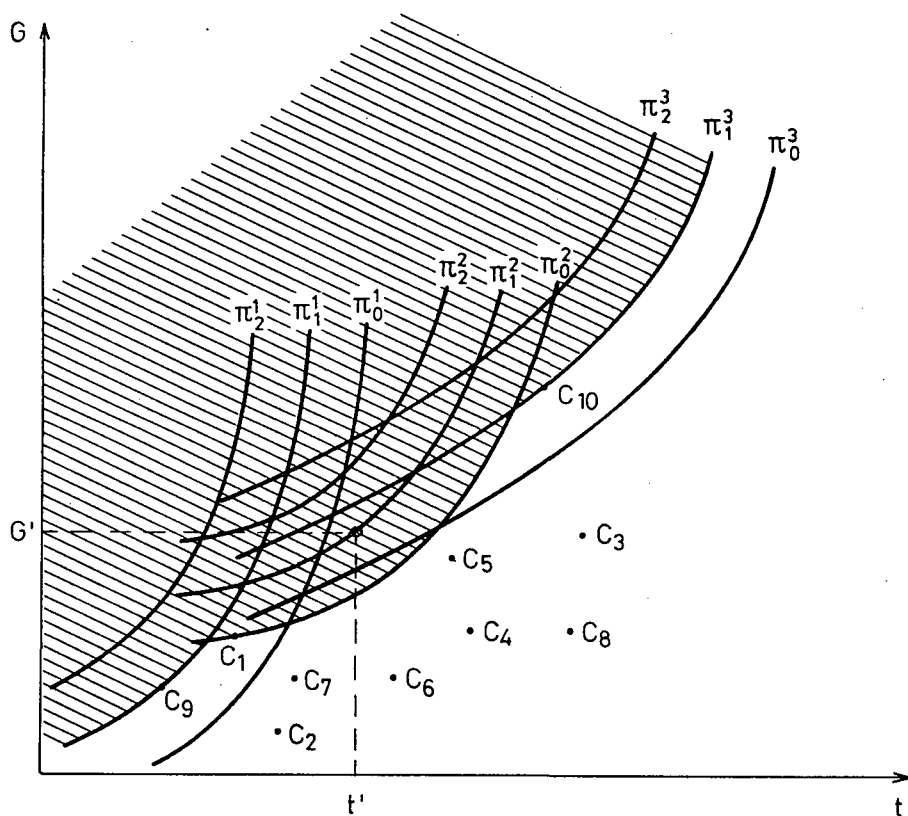
G_i^{j*} , t_i^{j*} , p^j , w_i , and r into equation (1). Firm j will perform similar calculations for all countries. It will invest in country i if

$$\pi_i^{j*} > \pi_k^{j*} \tag{7}$$

for all $k \neq i$.

Figure 1 depicts our analysis up to now. It illustrates the situation of firms and governments at the end of period 1, i.e. governments have not yet learned about the implications of the newly liberalized regime. On the horizontal axis the tax rate on investment ("t") is plotted, on the vertical axis the supply of club goods type A ("G"). The dots la-

Figure 1 - Competition among governments for internationally mobile resources



belled C_1 to C_{10} denote the decisions of different countries: country C_9 which has a very low tax rate on investment offers only a small supply of club goods. Country C_{10} finds itself at the other end of the spectrum with a high tax rate and a large supply of club goods. Note that the parameters t_i and G_i were set by each government according to the decision calculus described in equations (3) and (4).

Firms' decisions are represented in figure 1 by iso-profit curves. Curve π_0^1 , e.g., represents the locus of all combinations of t and G which lead to a marginal profit level of π_0 for firm 1. Iso-profit curves are positively sloped. As the tax rate increases, firms require an increasingly higher supply of Type A club goods in order to achieve the same level of marginal after-tax profits. Higher marginal profits are located to the north-west; if for the same tax rate a higher supply of firm-specific public goods is produced, the marginal profits of firms rise. The curve labelled π_1^1 is the highest iso-profit curve of firm 1 that is tangent to any of the offers of the different governments. In our hypothetical example, firm 1 will therefore locate its marginal investment project in country C_9 , firm 2 in country C_1 , and firm 3 in country C_{10} . All other countries will receive no new capital. The governments of countries C_2 to C_8 are expected to redesign their policies after going through a period of learning. A concrete example for such a change in policy might be for country C_3 to lower its tax rate on investment to t' while maintaining its supply of club goods (type A) at the level of G' . Such a policy combination would be preferred by firm 2 to its present location C_1 ($\pi_1^2 > \pi_0^2$). It would therefore invest in country C_3 in the next period. Of course any other country could also supply the policy package (G' , t'). In general we expect governments to attempt to become more successful in attracting internationally mobile resources and thus move towards the shaded area in figure 1. The following trends may be expected to accompany

this move towards more efficient government policies:

- unlike in the initial period of trial-and-error learning every country will attract some investment;
- the countries that were most attractive for investment in period 1 will receive a smaller share of total investment, both because other countries will catch up and because the profitability of marginal investment within their borders will decline; over time, the governments of those locations are expected to redesign their policies in order to offer a better menu of policies for prospective investors;
- the amount of transfers and subsidies (Type B club goods) will fall in all countries as governments devote a larger share of their income from taxes to the provision of Type A club goods.

Since each firm's profit depends in varying degrees on the productivity of capital and the parameters set by governments, not all firms will locate in one country. One can therefore imagine that this process may lead to a state where each country caters to a clientele of firms. The threat of not receiving new capital keeps governments efficient. Moreover, the existence of a wide choice of different government policies serves as a mechanism to discover particularly efficient government policies.¹ Albert Hirschman has drawn attention to the role of public goods in restraining exit of citizens and capital. He comes rather close to our present approach in his essay "Exit, Voice, and the State":²

"It is possible to visualize a state system in which, in spite of close contact and free movement of people and capital, exit would never assume threatening proportions because each country would supply its citizens with a different assortment of public goods, with emphasis on one area (or cluster) as a special attraction for its own citizens. Different countries would then 'specialize' in power, wealth, growth, equity, peacefulness, the observance of human rights, and so on."

¹ This point is emphasized by Eucken (1960), p. 57 and Vaubel (1985), p. 232.

² Hirschmann (1981), p. 263-264.

In many ways our approach also parallels Tiebout's analysis of local public goods. Tiebout (1956) argued that the supply of local public goods by communities (police protection, leisure amenities, roads etc.) could match the preferences for those goods because citizens would "vote with their feet" by moving to that community which best suited their preferences. In contrast to the standard theory of public goods where free riding impedes the revelation of preferences, Tiebout maintained that there is a competitive mechanism (migration to attractive communities and away from unattractive communities) which would fashion the supply of local public goods in accordance with citizens' preferences. Our present approach takes the Tiebout paradigm to the national/international level: voting by one's feet is substituted by voting by one's capital¹, local communities are now nation states and the services on offer are macro-economic policies such as tax regimes, monetary policies, the supply of infrastructure etc.

Parallels between the work sketched out here and research in local public finance such as Tiebout's model are by no means accidental. Increasing economic interdependence has the tendency to render political borders obsolete.² Because of this tendency, the economic relations of nation states (trade and factor movements) become increasingly similar to those of federal states within a nation state. This implies that national governments' ability to affect the course of their economies will be increasingly limited. It seems interesting to speculate on possible reactions of politicians faced with this prospect.

¹ Note, however, that voting by one's feet is at work even on the national/international scale. The discussion on the "brain drain" from developing countries to developed countries is a case in point.

² Cf. Giersch (1989) for an elaboration of this point.

II.3. International coordination of policies

Competition for internationally mobile resources among policymakers will be reduced if national governments find it worthwhile to coordinate their policies. The choice between policy competition and policy collusion will be governed by the net benefits that policy-makers can derive from each activity. At this stage it is of importance to distinguish between two models of politicians' behaviour. The Keynesian policy-maker is usually assumed to act in the interest of the citizens of his own country but not in the interest of citizens of other countries. In other words, he will only adopt those policies which he expects to benefit his own citizens regardless of their effects on other countries. Critics of the pro-coordination-view have argued (in line with public choice theory) that politicians act neither in the interest of citizens of their own country nor in the interest of citizens of other country but are primarily concerned with furthering their own goals. In the present paper we explore the implications of both modes of behaviour within the framework of competition for capital. We begin by elaborating on the costs and benefits of coordinating policies for the politician assumed to pursue the good of his own country's citizens.

In a Keynesian world where output is demand determined, the benefits from coordinating policies for each individual policy-maker essentially derive from the fact that demand spillovers are traded. Each policy-maker knows that his own measures will have some effect on demand and output in the other country. By entering into cooperation with other policy-makers, he trades these spillover effects. Just like in any other trade, both policy-makers (and their countries) gain. Against this gain the costs of coordinating policies and policing the agreement have to be set but they are usually thought to be negligible.

From the competition-for-capital-view presented here, there are no spill-overs that can be traded. Each country captures the benefits of its policies exclusively because enterprises will have to move within its borders in order to benefit from them.¹ If there are no gains to be traded, a benevolent policy-maker cannot expect to gain anything from policy coordination. Any international policy agreement designed to benefit other countries would invariably amount to an attempt to render his or her own country less attractive to internationally mobile resources. By definition a benevolent policy-maker would never accept such an international agreement.

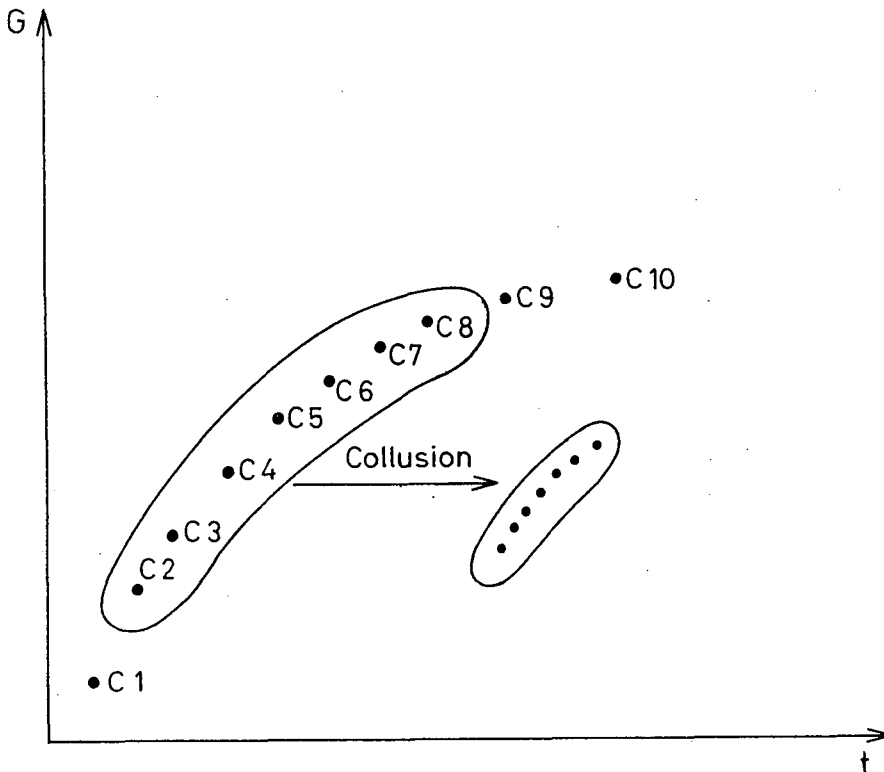
How do these conclusions change if we assume the public choice mode of behaviour for politicians? Leviathan-type behaviour of politicians can be modelled along the lines of section II.1., i.e. politicians are mainly interested in maximizing the amount of transfers and subsidies S_i that they exchange for vote support in elections. From equation (2) it is clear that S_i increases only if politicians manage to raise the price of their product (t_i) or - with a given price t_i - produce a smaller amount of club goods Type A without inducing a flight of mobile resources. As long as governments have to compete for internationally mobile resources, however, the exit-(and: non-entry-)option of owners of mobile capital serves as a restraint on attempts to raise S_i beyond a "normal" level, i.e. as a restraint on Leviathan-type behaviour. In this sense competition among governments can be considered as a substitute for more formal, direct attempts to curb "the power to tax", such as constitutional amendments.² International coordination in the field of macroeconomics, on the other hand, can be inter-

¹ Cf. Drèze et al., p. 25: "[the supply side] by and large does not require cooperation... Indeed, most of the supply-side measures ... can be implemented at national levels by individual countries acting on their own. Not only the measures, but also their effects, are of a primarily domestic nature".

² Cf. Brennan and Buchanan (1980), Ch. 9.

preted as an act of collusion among governments. By removing international competition among policies, governments would be able to raise the price of goods supplied by them, enlarge their own choice set but reduce the choice set of citizens.¹ Intergovernmental negotiations over macroeconomic policies remove a constraint on the Leviathan tendencies of governments. This idea can be demonstrated using our previous diagram. Suppose that the governments of countries C₂ to C₈ ("G 7") decide to coordinate their macroeconomic policies. Public choice analysis then predicts a concerted shift to the east, possibly to the south-east of the diagram. This represents the increase in the price of the goods supplied by governments. In addition, it is expected that policies will converge to the same philosophy (e.g. "removing imba-

Fig. 2 - From Competition to Collusion: How the Choice Set of Investors is Narrowed



¹ Vaubel (1985), pp. 234-235.

lances"). This convergence represents the shrinking of the choice set of firms.¹ Figure 2 also shows that the formation of the policy cartel is endangered by outside competition. Country C_1 ("Switzerland") is a case in point: by not joining the coordination effort, its relative attractiveness is even enhanced by the coordination exercise.²

If politicians seek to further their own goals, possibly at the expense of their constituency, international negotiations thus open the possibility of escaping from restraints on such tendencies. This might be one reason for the recent upsurge in demands for international policy coordination. Contrary to many statements in the press and in communiqués of summit meetings, increased interdependence per se does not necessitate the increased coordination of policies.³ It does, however, narrow the choice of what politicians can do. For a politician faced with this prospect, international negotiations hold the promise of putting the control over resource allocation at least partially back into his/her own hands and away from the market for policies.⁴ The gains from negotiating policies therefore increase for the individual policy-maker as policy competition increases.

1. Cf. with Olson (1986), p. 123, who argues: "There is a need for distinctive jurisdictions whenever people in different communities demand greatly different public goods and leaderships".

2. Assuming that "G7" does not evolve into a fortress by curbing resource mobility to the rest of the world. Even then C_1 would, however, gain from increased capital inflows originating in third countries.

3. A formal proof can be found in Martinez Oliva (1989).

4. A number of authors have focussed on the question when such a linkage among two or more jurisdictions yields net benefits to politicians. Cauley et al. (1986) show that the fixed costs of establishing the linkage, the number of participants and the conjectures of each participant concerning the behaviour of the other participants are all decisive factors. Related work can be found in Sandler et al. (1983) and Olson (1986).

II.4. A historical example: Money supply and inflation rates after 1973

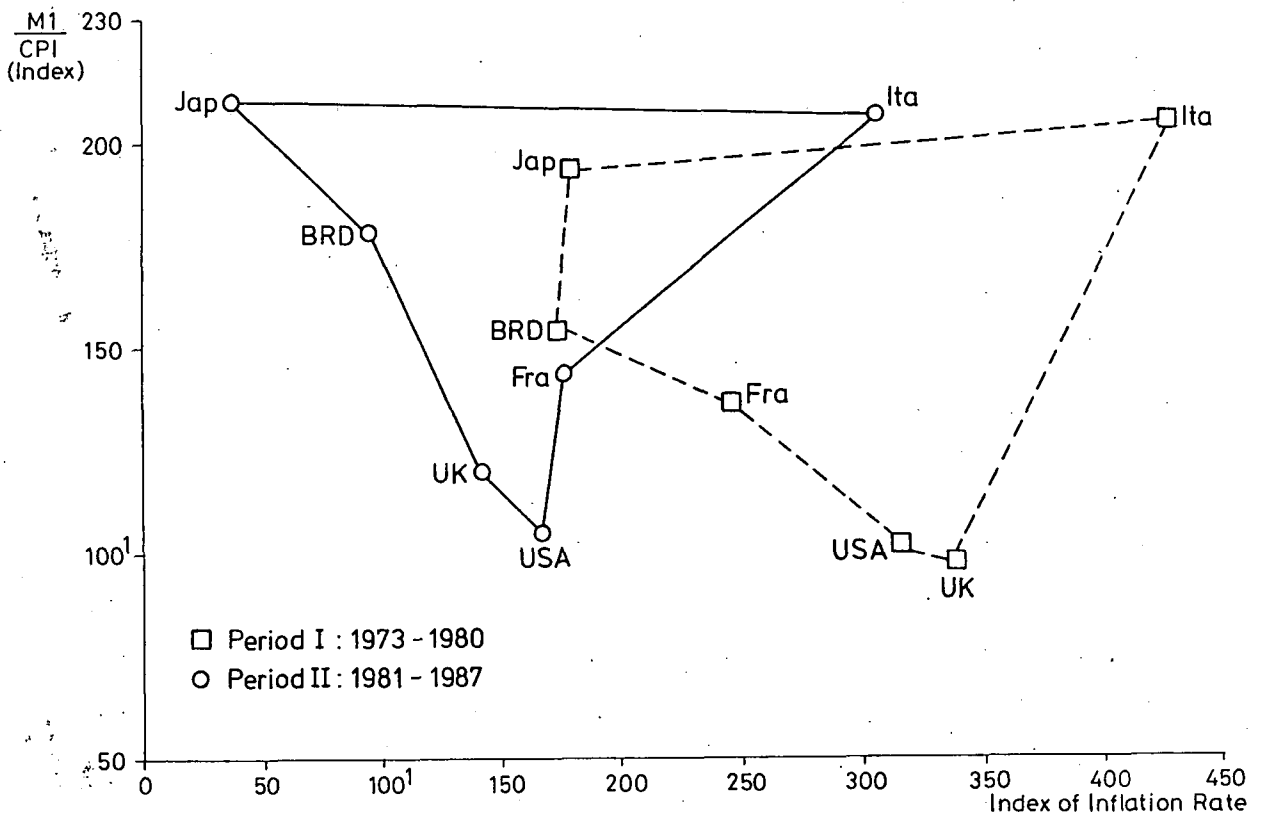
We illustrate the competitive process among governments by a closer look at the evolution of real money stocks and inflation rates in different countries after the break-down of the Bretton Woods-System. The Bretton Woods-System of fixed exchange rates can be seen as a cartel of producers of money under the price leadership of the United States. Each member of the cartel was allowed to supply a particular clientele of customers, i.e. the population of the respective member countries. Although one of the principal aims of the Bretton Woods-System from the outset, non-resident convertibility was only granted by very few member governments, West Germany being one of them. As a result, competition among the different producers of money was effectively curtailed, the system closely resembled a cartel of local monopolists.

It is well-known that the Bretton Woods-System owed its demise mainly to the decision of the price-leader United States to raise the price of holding money, i.e. the inflation rate, to a level that was no longer accepted by the other members of the cartel. We argue here that the end of the cartel marked the beginning of a competitive process among the different producers of money, i.e. the different central banks. Actual developments after 1973 are therefore expected to resemble the theoretical events predicted for "period 1" as set out in section II.2. In particular, we expect an initial learning period where governments continue to act as (local) monopolists, but are no longer constrained by the control of the price leader. After the initial learning period is over and countries enter "period 2", those governments that were not particularly successful in their policies in the first period are expected to revise them, moving - in terms of fig. 1 - in a north-westerly direction. To close observers of international monetary affairs during

the last two decades it will not come as a surprise that actual events conform rather closely to the theoretical picture painted here.

Fig. 3 charts the inflation rate (defined as the annual rate of change of the consumer price index) and the real money stock (defined as M1 deflated by the consumer price index) of six major industrial countries after 1973. The initial learning period ("period 1") was arbitrarily defined to encompass the first eight years after the break-down (1973-1980), "period 2" comprises the following seven years (1981-1987). The average levels of the real money stock and the inflation rate during the years before the end of the Bretton Woods-System (1960-1972) serve as an index base for each country. Thus in period 1 (1973-1980), the inflation rate in West Germany ("BRD") was on average 5.02 p.c. This

Figure 3 - Real Money Stock and Inflation Rates after the Breakdown of the Bretton Woods-System



¹ Average level during 1960 - 1972 = 100

constitutes an increase of 71 p.c. over the average inflation rate in the base period (1960-1972), 2.93 p.c. For the real money stock, the increase in the level from the base period (143 billion DM) to period 1 (220.2 billion DM) is equivalent to an increase of 54 p.c. The coordinates of the West German position in Fig. 3 are thus (171, 154) for period 1 if the average levels of the inflation rate and the real money stock from 1960 to 1972 are set at 100 each to serve as the index base. The position of other countries and for period 2 are similarly calculated.

The following observations emerge from Figure 3:

- The biggest increase in the real money stock compared to the base period occurred immediately after the Bretton Woods-System's breakdown and was most pronounced in Italy, Japan, West Germany and France. The real money stock of the cartel leader USA remained practically constant, while that of the United Kingdom declined slightly in period 1.
- In period 2 only the central banks of West Germany, Japan and the United Kingdom increased their real money stock by a considerable amount. With the exception of the United Kingdom, this increase was far less than that following the breakdown of the Bretton Woods-System. Except for the Bank of England in the first period, no central bank actually lowered its real money stock below the level of the base period.
- All central banks raised the price of their product, i.e. their inflation rates, in period 1. They did so in widely varying degrees with West Germany and Japan at the lower end of the spectrum and Italy and the United Kingdom at the upper end.
- In period 2 all central banks engaged in price competition, i.e. they lowered their respective inflation rates. Only West Germany and Japan, however, managed to offer their money stock at a price (inflation rate) below the level that prevailed during the Bretton Woods-System.

- In period 2 inflation rates started to converge to an average level of inflation similar to the one prevailing under the Bretton Woods-System. Nevertheless, there is a crucial difference: while low inflation rates under the Bretton Woods-System were the result of hegemonic pressure by the price leader of the cartel, they were now the result of a - possibly painful - trial-and-error learning process. As such, however, low inflation rates are expected to be more firmly advocated and pursued by policy-makers than before.

The behaviour of inflation rates and the real money stock in six major industrialized countries thus converges to our theoretical predictions rather well. The break-down of the Bretton Woods-System constitutes the collapse of a cartel of central banks and governments. Not unexpectedly, with the dismantling of the cartel, it was the "minor" cartel members who increased their supply of real balances the most while the supply of the cartel's leader hardly changed. This seems to indicate the presence of hegemonic pressure by the United States on the smaller members of the Bretton Woods-System to maintain a low supply of real balances as long as they had been part of the cartel.¹ After the cartel's collapse all central banks misjudged the demand for real balances considerably and as a consequence inflation rates increased along with the stock of real balances in period 1. It was only after this initial learning period was over that central banks started to move - in terms of Figure 1 and 3 - in a north-westerly direction towards more efficient policies. Central banks predominantly engaged in price competition, they did not raise their real money stocks in any considerable degree in the second period after fixed exchange rates were abandoned.

¹ We note the "special relationship" of the cartel leader with the United Kingdom.

III. A Closer Look at the Assumptions of the Alternative View

In this section we examine some of our main assumptions in order to indicate areas of further research. We also point to some related work of others.

III.1. Behaviour of entrepreneurs: How mobile is international capital?

The key assumption of our approach is a high mobility of capital. As long as capital mobility is low, local governments are protected from the competition of other governments and locations. Two effects of capital mobility on competing governments are crucial for our approach:

- capital has to shy from locations where imprudent policies are pursued, thereby signalling to the incumbent policy-makers the need for a salutary change in policies, and
- governments that have adopted good policies must be "rewarded" by inflows of capital from abroad.

The idea that capitalists avoid countries where the profitability of their investment projects is reduced by government policies is not new. Among the first to describe this phenomenon was Adam Smith:¹

"The proprietor of stock is properly a citizen of the world, and is not necessarily attached to any particular country. He would be apt to abandon the country in which he was exposed to a vexatious inquisition, in order to be assessed to a burdensome tax, and would remove his stock to some other country where he could, either carry on his business, or enjoy his fortune more at ease. By removing his stock, he would put an end to all the industry which it had maintained in the country

¹ Adam Smith, *Wealth of Nations*, Book V, Part II.f.6.

which he left. Stock cultivates land, stock employs labour. A tax which tended to drive away stock from any particular country, would so far tend to dry up every source of revenue, both to the sovereign and to the society."

Whether the flight of capital initiates a change for the better in the economic policies of the country is an open question. The experience of France during the early eighties and her subsequent turn to more supply-side policies seems to be a case in point. The experience of a number of developing countries that underwent periods of substantial capital flight raises doubts, however, since no clear reversal in their policies can be - as yet - discerned.

The importance of capital mobility for policy competition goes beyond curbing harmful policies. It is also assumed to be a way of finding the optimal tax rate and the optimal supply of public goods. For this to be true, it is not enough that capital movements signal bad policies, they must also "reward" good policies by increasing the capital stock of a country. In other words, inward capital movements have to occur in response to prudent policies and lead to additional investments in that country. This is not self-evident as was clearly understood by Adam Smith:¹

"The capital, however, that is acquired to any country by commerce and manufactures, is all a very precarious and uncertain possession, till some part of it has been secured and realized in the cultivation and improvement of its lands... No part of it can be said to belong to any particular country, till it has been spread as it were over the face of that country, either in buildings, or in the lasting improvements of land."

In other words, a flow of financial capital to another country is a necessary but not a sufficient condition for an increase in the real capital stock of the receiving country. For a transfer of real capital from one country to another to occur there must be a net transfer of financial capital

¹ Adam Smith, *Wealth of Nations*, Book III, Part IV.

and that inflow must be used for "lasting improvements of land" (as Adam Smith put it) or for investment in plant and machinery (in a more modern language). Since capital borrowed from abroad can be used either for investment or for consumption, it is far from clear whether net financial flows of capital lead to increases in the capital stock.

The fact that the high mobility of international financial capital does not necessarily imply a high mobility of real capital has been noted by a number of authors.¹ Empirical evidence seems to suggest that the mobility of real capital is in fact rather low: following up a study of Feldstein and Horioka (1980), Dooley, Frankel and Mathieson (1987) find that investment levels and saving levels as well as changes in these levels are positively correlated in a large number of countries over long periods of time. Why should such a positive correlation be a sign of low capital mobility? The reasoning is roughly as follows: with perfect capital mobility, a marginal increase in domestic savings should be allocated by the world capital market to various locations in the world according to the relative elasticity of the marginal productivity of capital in those locations.² In general this need not result in a corresponding increase of domestic investment. Similarly, improved investment conditions within a country need not imply an increase of domestic savings. Instead, one would expect this country to attract capital from abroad to match the additional investment opportunities. Several reasons have been given for the apparent slowness of international real capital movements:

- it takes time to build up the real capital stock - factories and machines are not created instantaneously;
- within a foreign jurisdiction, the risk of expropriation might prevent investment to take place.

¹ Dooley, Frankel and Mathieson (1987), p. 522 ff.; Niehans (1984), pp. 120 ff.; 195 ff.

² For a theoretical demonstration cf. Niehans (1984), pp. 111-112.

Fundamentally, however, the issue remains unresolved: "We do not know why the apparent isolation of national markets for physical capital has persisted in the face of substantial expansion of trade in goods and services and in financial capital".¹ We plan further research in this direction.

III.2. Does government activity matter?

We have assumed that government activities are a decisive factor in explaining the locality of firms' investment and therefore affect - for better or for worse - a particular country's growth rate. This is by no means self-evident: macroeconomic determinants of growth have only recently been considered as explanatory variables for economic growth.² This growing emphasis on government activities as determinants of growth reflects on the one hand the increased role of the state in economic activity. It reflects on the other hand the fact that the industrialized countries have seen their traditional resource endowments (proximity to centers of economic activity, natural resources) come under increasing competition from developing countries as economic distances shrank because of technological advances in transportation and telecommunication. For industrialized countries, therefore, locational advantages increasingly come to depend upon the ruling macroeconomic regime. In particular, we expect differences in macroeconomic policies to be the crucial determinant of relative growth performance in advanced industrialized countries, because they are roughly similar as far as per capita capital endowments and natural resource endowments are concerned. Between developed and developing countries, traditional factors such as resource endowments etc. may still have a major role to play. Competition among policies is therefore expected to be especially pronounced among the advanced industrialized countries.

¹ Dooley et al. (1987), p. 528.

² Cf. e.g. Kormendi and Meguire (1985) and Heitger (1986).

III.3. Tax competition

While product competition essentially rests upon the ability of governments to match their supply of club goods to the needs of firms, price competition is not concerned with product differentiation. Drawing a horizontal line through any level of the club goods supply G in Figure 1, price competition essentially forces governments to the western most points on such horizontal lines. The term "tax competition" has been used for the adjustment of taxes in response to pressures from outside the jurisdiction. In the literature, tax competition is most frequently treated in the area of fiscal federalism. In particular, the question is raised whether the tax policies of federal states could lead to inefficient results if they are not coordinated in one sense or the other. Among the first authors who have answered this question in the affirmative is Wallace Oates (1972, p. 143):

"The result of tax competition may well be a tendency toward less than efficient levels of outputs of local public services. In an attempt to keep tax rates low to attract business investment, local officials may hold spending below those levels for which marginal benefits equal marginal costs."

Lately this question has sparked interest once again, in particular because the Reagan tax reform of 1986 abolished the deductability of state and local sales taxes from income taxes, a measure that was interpreted as a move towards more tax competition among U.S. federal states.¹ The possibility of *international* competition among tax regimes was noted by the Sachverständigenrat zur Begutachtung der gesamtwirtschaftlichen Entwicklung (German Council of Economic Advisers) in its 1985 annual report, in which it prophesized that "Ein Wettbewerb der Steuersysteme zeichnet sich ab".² How would such competition work?

¹ Cf. McLure (1986) and comments on his article by Break (1986) and Wildasin (1986). There is also a sizable theoretical literature on tax competition. Cf. the references in McLure (1986) and his critique of their conclusion that tax competition is inefficient.

² Sachverständigenrat (1985), p. 138.

A change in the tax regime of a country can only improve that country's attractiveness for business if it manages to improve investment conditions. The international repercussions of such a policy can be sketched out in a rough way. First of all, the tax reform should raise the marginal efficiency of capital. This would tend to stimulate domestic investment because additional investment projects become profitable. The real rate of return and the real interest rate rise. If nothing else happens and in particular, if tax policies in other countries remain as they are, this move would tend to increase the amount of goods used inside the country. The trade balance becomes less positive or more negative. The monetary side of the adjustment process tends to produce similar results. As the real rate of return on investment in the country adopting the tax reform rises, the demand for financial assets from that country will tend to rise, if the increase in the rate of return on real assets feeds through to financial assets. This increased demand will lead to an appreciation of the currency of the reforming country, partially offsetting the initial incentive to export capital there. The net result is expected to be a less positive or more negative current account balance. This implies a success: contrary to mercantilistic policies, a policy of improving the attractiveness of a country as a site for investment implies, c.p., a more negative or less positive trade balance. This is simply because fewer goods leave the country and/or more goods enter it. In this sense a tax reduction can be a feasible and sensible policy for a single country to pursue.

It is interesting to note that a reduction in the tax rate on interest and profit income of the investor is not sufficient to attract more capital from abroad. This is so for a very simple reason: the interest income on domestic and foreign assets is - at least among OECD countries - taxed according to the residence principle.¹ A (honest) German

¹ For an elaboration of this point, cf. H.W. Sinn (1988).

investor in American bonds is not induced to hold more American bonds if the tax on interest income in the U.S. is lowered. He would still have to declare interest income from U.S. bonds in Germany and be taxed according to German taxes. He cannot escape the German tax by placing his capital elsewhere as long as the residence principle operates and as long as he reveals the interest received from foreign bonds. He will actually have to take up residence in the low tax country in order to profit from the lower tax. That type of mobility, however, is low and it needs a strong incentive, i.e. a high taxable income, to exit to Monaco. The main instrument of the politician anxious to attract capital from abroad therefore is the tax rate on corporate profits. Its reduction will benefit international investors regardless of their own taxes on profit and interest income because it will tend to increase the interest and profit income before it is subject to local taxes.

IV. Conclusions

The following conclusions emerge from this paper:

1. Unwittingly or not, politicians find themselves in competition for internationally mobile capital when formulating economic policies.
2. If policies are competitive, reduced investment and capital flight are expected to serve as corrective feedback mechanisms for bad economic policies. Policies are thus expected to converge towards a spectrum of viable packages of economic policies. We illustrate this trial-and-error process by evidence on inflation rates and money stock trends in the post-Bretton-Woods-era.
3. While competition among politicians serves investors in every country and will be pursued by benevolent policy-makers, it reduces the choice set of Leviathan-type poli-

ticians. They will try to mitigate the impact of exit mechanisms by increasing the domain of national policies. Since we consider the Leviathan-model a reasonably accurate description of politicians' behaviour, we share sceptical views arguing against increased international policy coordination. The case for maintaining and fostering competition among politicians is equivalent to the case for maintaining and fostering competition among firms.

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