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IS BILATERALISM BAD?

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ABSTRACT

In the 1980s the process of trade liberalization through multilateral negotiation seems to have run aground. In its place there have been a number of bilateral and regional moves toward liberalization. Some have been concerned that these local deals may, by undermining the multilateral process, actually reduce world trade and welfare. This paper develops a simple model of the effects of regional trading blocs, and shows that consolidation of the world into a smaller number of such blocs may indeed reduce welfare, even when each bloc acts to maximize the welfare of its members. Indeed, for all plausible parameter values world welfare is minimized when there are three trading blocs. More complex versions of the model offer softer results, but the main thrust is still to validate concern over the effects of bilateral and regional trade deals.

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In the 1980s the process of trade liberalization through multilateral negotiations within the GATT framework seems to have run aground. Major areas where conventional trade restrictions remain legion, such as agriculture and services, appear resistant to major progress. Meanwhile the "new protectionism" of voluntary restraint agreements, anti-dumping actions, and so on has eroded the effectiveness of the GATT in dealing with trade in manufactures. The result has been increasing disillusionment with the multilateral process, and an increasing focus on alternative trade strategies.

Perhaps the most important of these strategies has been the turn to bilateral or regional arrangements for trade. The most important agreements on trade in the past decade have been the "completion of the internal market" that the European Community has agreed to achieve by 1992 and the free trade agreement between the United States and Canada. Regionalism is also apparent in the enlargement of the European Community to include several semi-industrialized countries on Europe's rim. Japan, while not explicitly engaging in regional trading pacts, has recently sharply increased its manufactures imports from East Asian NICs; it is widely argued that the de facto protectionism that results from Japan's cartelized distribution system is being selectively dismantled for nearby countries in which Japanese direct foreign investment is increasingly significant. With growing discussion of further enlargement of the EC and of the possibilities for special trading arrangements between the US and Mexico, many economists and businessmen have

begun to raise the possibility that the multilateral GATT trading system is giving way to a world of three main trading blocs.

One might expect that experts in trade negotiation would be at least fairly positive about the bilateral and regional trade liberalization that has taken place in recent years. World-wide liberalization might be better still, but isn't half a loaf better than none? In fact, however, there are widespread misgivings. While it is difficult to get a very explicit statement of the concern, in general what trade policy experts seem to be worried about is the possibility that countries that join trading blocs will be more protectionist toward countries outside the blocs than they were before, so that world trade as a whole will be hurt more than helped by moves that at first sight seem to be liberalizing in intent. The clearest example of this concern is the widespread discussion of the possibility that 1992 will lead to the creation of "Fortress Europe", an increasingly closed market to the rest of the world.

A full analysis of the costs and benefits of bilateral trading arrangements would require a healthy dose of political science, and a careful analysis of the process of bargaining in trade negotiations. It would also require some realism in modeling the actual participants in the game. As a first step, however, it may be useful to have a minimal model in which the concerns about formation of trading blocs can be expressed, in order to give us some more foundation for our intuition about the subject. That is the purpose of this paper. I offer a simple approach to modeling trade

liberalization and trade conflict in which the tension between the benefits of special trading arrangements and their negative effect on the world trading system can be clearly seen. In answer to the question posed by the title of this paper, whether bilateralism is bad or good depends; but as we will see, in the context of a simple model we can get a pretty good idea of what it depends on.

This paper is in four parts. The first part reviews some of the existing theory on preferential trading arrangements, and sets out the basic logic of this analysis in an informal way. The second part sets out a simple economic model that can be used to offer a more precise treatment of the issue, in which we can show how the outcome of trade policy at a world level varies with the number of trading blocs into which the world is organized. The third part examines the welfare implications of changes in the number of trading blocs. Finally, the paper concludes with a brief discussion of an extended model in which there are "natural" trading blocs defined by transportation costs, and asks how the presence of such natural blocs alters the results.

1. Preferential trading arrangements: general considerations

A naive view would be that since free trade is better than protection, any movement toward freer trade must be a good thing; that preferential trading arrangements are at any rate a step in the right direction. It is

a familiar and indeed famous result, however, that this is not always true -- half a loaf may be worse than none. In the celebrated analysis of Viner (1950), it was shown that a customs union may cause losses because it leads to "trade diversion" instead of "trade creation" -- that is, instead of specializing more and increasing efficiency, countries that form a trading bloc may substitute each others' more expensive goods for goods from outside the bloc, leading to a loss of efficiency. Thus at one level we could argue that bilateral or regional trading arrangements could be destructive if they lead to trade diversion instead of trade creation.

As a general source of concern, however, the risk of trade diversion seems a weak point. It shows that under certain circumstances a customs union could be a mistake -- but this is true of many economic policies, and policy concern based on the possibility of widespread stupidity by governments may be realistic but is not very interesting. Also, while a customs union with a given external tariff may be harmful to the members, a customs union that adjusts its tariff optimally is always beneficial; while optimal adjustment may be unlikely in practice, again this seems to reduce the concern over bilateralism to a fear that governments will make mistakes.

The point that a customs union is always potentially beneficial to its members has been made formally by Kemp and Wan (1976). It may be useful to state the point informally. Suppose that two countries that happen to have the same tariff rate form a customs union. If they did not alter their external

tariff rate, the increased trade within the union would represent a mixture of trade creation and trade diversion. Since the trade diversion would be harmful while the trade creation would be beneficial, the overall welfare effect would be ambiguous. (There may also be a terms of trade effect, to which we return below). The Kemp-Wan point, however, is that by adjusting the external tariff the members of a customs union can always insure a gain. Specifically, by reducing the tariff to the point at which external trade remains at its pre-union level, the countries can ensure that there is no trade diversion. Also, since at this reduced tariff rate the offer to the rest of the world would be unchanged, the terms of trade of the customs union would also remain the same. So the welfare effect of a customs union that lowers its external tariff enough to prevent trade diversion is unambiguously positive. Now in general the customs union may choose to have a different tariff level than this; but if it does so, it is because this other tariff level yields still higher welfare. Thus a customs union is always potentially beneficial.

So far so good. But the last point -- that a customs union may choose a tariff rate that is different from the one that leaves external trade at its pre-union level -- raises a potential negative possibility. The reason is that almost surely the optimal tariff rate for the customs union will be higher than this constant-trade level, because the customs union will want to take advantage of its size to improve its terms of trade. Indeed, we may expect as a general presumption that a customs union, being a larger unit with more

market power than any of its constituent members, will have an optimal external tariff that is higher than the pre-union tariff rates of the member nations. Thus while our proof of potential gains relies on the hypothetical case of a customs union that does not lead to any trade diversion, in fact a customs union ordinarily will choose policies that do lead to trade diversion.

But this means that the formation of a customs union, while necessarily beneficial to the members, will certainly be harmful to the rest of the world and may reduce the welfare of the world as a whole (if such a measure can be defined).

Now let us return to the concern over bilateral and regional trading arrangements. One way to rationalize the concern of the trade negotiation professionals is the following: they fear that there may be a Prisoners' Dilemma at work in the formation of trading blocs. Imagine a world consisting of four countries, A,B,C,D. Let A and B form a customs union; then other things equal they will be better off. However, they will have an incentive to improve their terms of trade by maintaining an external tariff that induces trade diversion -- indeed, probably an external tariff that is higher than either of them would have on their own -- and which therefore leaves C and D worse off. Similarly, C and D will be better off, other things equal, if they form a customs union, but their optimal external tariff will similarly induce trade diversion in the effort to achieve improved terms of trade. What could happen is that the resulting tariff war will induce enough trade diversion to

leave everyone worse off than if they had not formed the customs unions.

This story is, of course, a caricature of the actual process of tariff-setting. I have described a world in which trade policy of nations is set to maximize national welfare, and in which trading blocs behave noncooperatively. This makes internal politics look better and external relations worse than they are in fact. In reality nations set trade policy in a fashion that reflects internal conflicts of interest more than promotion of national interest vis-a-vis foreigners, and international trade policy reflects a fair degree of bargaining. However, this story does capture the basic idea that formation of trading blocs, while advantageous in itself, may have an adverse effect on the multilateral system and in the end be harmful. Thus while we will eventually need a more realistic story, this seems like a useful starting point.

The story also points us toward an interesting question: how does world welfare vary with the number of trading blocs into which the world is organized? Absent any market imperfections, the optimal number of trading blocs is, of course, one -- i.e., free trade. One might at first suppose that this implies that the fewer trading blocs, the better. However, in the general second-best logic that prevails here, that is far from clear. If a world consisting of many small trading blocs, each of which is very open to external trade, consolidates into a somewhat smaller number of blocs, each of which is still very open to external trade, most of the expansion of intra-bloc trade

may come from trade diversion rather than trade creation. Thus when the number of blocs is reduced from a very large number to a still fairly large number, it would not be surprising to find that world welfare falls. Conversely, when there are only a few trading blocs, doing only limited trade with each other, most of the expansion of intra-bloc trade when they consolidate into a still smaller number of blocs will represent trade expansion, and welfare will probably rise. Thus the number of trading blocs at which world welfare is minimized -- henceforth referred to as the pessimal number -- will probably be some moderate number of blocs. A world that is either more or less fragmented will have higher welfare.

This is about as far as informal argumentation can take us. To firm up the intuition, and to provide further insight, we now turn to a formal model.

2. Trading blocs and tariff-setting: a formal model

In order to make the analysis of the problem of bilateralism tractable, I consider a very special model. In this model, all nations and trading blocs appear symmetrically, so that we can meaningfully describe the world in terms of the representative nation or trading bloc. Also, it turns out to be helpful to assume particular functional forms. Thus this model is illustrative rather than conclusive. However, it does, as we will see, yield some striking insights.

Consider, then, a world whose basic elements are geographic units which I will refer to as "provinces". There are a large number N of such provinces in the world. A country in general consists of a number of provinces. For the analysis here, however, I will basically ignore the country level of analysis, focussing instead on "trading blocs" that contain a number of countries (perhaps only one), and thus a larger number of provinces. Specifically, there are B<N trading blocs in the world. These trading blocs will be assumed to be symmetric, so that each contains N/B provinces; the integer constraint is ignored. A main purpose of the analysis will be to find how world welfare depends on B.

Each province is specialized in the production of a single good that is an imperfect substitute for the products of other provinces. All provinces will be assumed to be the same economic size, so without loss of generality I will choose units so that each produces one unit of its good. All provinces have the same tastes, into which the products of all provinces enter symmetrically, with the specific functional form

$$U = [\sum_{i=1}^{N} c_i^{\theta}]^{1/\theta} \qquad 0<\theta<1 \qquad (1)$$

where c_i is the province's consumption of the good of province i. This is of course a CES utility function, where the elasticity of substitution between any two products is

$$\sigma = 1/(1-\theta) \tag{2}$$

The resemblance between this setup and standard monopolistic competition models of trade is obvious and not coincidental; indeed, this formulation was suggested by an analysis of optimal tariffs in a monopolistically competitive world by Gros (1987). If you like you may regard a "province" as an area with fixed resources that specializes in a limited number of differentiated products because of increasing returns. However, this interpretation is not necessary, and the model may also be viewed as arising from a perfectly competitive environment.

A trading bloc is a group of provinces with internal free trade and a common external ad valorem tariff. The external tariff rate is chosen so as to maximize welfare, taking the policies of other trading blocs as given (because of the symmetry among provinces, there are no internal income distribution effects). This is a standard problem in international economics: the optimal tariff for a bloc is

$$t^{*} = 1/(\epsilon - 1) \tag{3}$$

where ϵ is the elasticity of demand for the bloc's exports.

To determine ϵ, consider the imports of the rest of the world from a

representative trading bloc. The "rest of the world" consists of the $N(1-B^{-1})$ provinces that are not part of the bloc; given the symmetry of the model, the price of the goods produced by all these provinces will be the same. Let y^W equal the volume of output of the rest of the world, equal to

$$y^W = N(1-B^{-1}) \tag{4}$$

Also, let d^W be the volume of rest of world consumption of rest of world products, and m^W be rest of world imports from our trading bloc. Then we must have

$$d^W + pm^W = y^W \tag{5}$$

where p is the price of our bloc's output relative to rest of world output on world (not internal) markets.

Now consider the effects of a change in p, holding the ad valorem tariff rates constant. Letting a "hat" over a variable represent a proportional change, we must have

$$(1-s)\hat{d}^W + s(\hat{p} + \hat{m}^W) = \hat{y}^W = 0 \tag{6}$$

where $s = pm^W/y^W$ is the share of imports from our bloc in income at world prices. Also, with ad valorem tariffs internal prices will change in the same proportion as external, so given the constant elasticity of substitution we must have

$$(\hat{d}^W - \hat{m}^W) = \sigma\hat{p} \tag{7}$$

Putting (6) and (7) together, and rearranging, we have

$$\hat{m}^W = -[s + (1-s)\sigma]\hat{p} \tag{8}$$

implying that our bloc faces an elasticity of demand for exports

$$\epsilon = s + (1-s)\sigma \tag{9}$$

and therefore that the optimal tariff rate is

$$t^* = 1/[(1-s)(\sigma-1)] \tag{10}$$

There are two interesting points to notice about this expression. First is that the optimal tariff is increasing in s; that is, the larger the share of a trading bloc's exports in rest-of-world expenditure, the higher the

tariff it will charge. On the other hand, no matter how small the share, the optimal tariff does not go to zero; as s goes to zero t^* goes down only to $1/(\sigma-1)$. This is because there are no "small countries" in the sense of price-takers in this model: even an individual province produces a differentiated good and therefore has a positive optimal tariff. As Gros (198?) has pointed out, this is normally the case in monopolistically competitive models, where the optimal tariff for a small country equals the markup of price over marginal cost.

The share variable s is of course endogenous, depending for a given number of trading blocs on the tariff rate. Thus we turn next to the determination of s.

Let y be the volume of output of a representative trading bloc; we know that

$$y = N/B \tag{11}$$

Let m be the volume of this trading bloc's imports, and d the volume of consumption of its own goods. In a symmetric equilibrium, in which all blocs have the same tariff rate, the goods of all regions will sell at equal prices on world markets. Thus the budget constraint for a representative bloc is

$$m + d = y \tag{12}$$

Next consider the relative demand for goods produced inside and outside of the bloc. There are N/B goods produced by provinces inside a representative trading bloc, implying N(B-1)/B goods produced outside. If consumers faced the world prices of these goods, which are equal, then given the symmetrical way in which the goods enter into demand we would have m/d = B-1. Since consumers must pay a tariff rate of t on extra-bloc goods, however, and since the elasticity of substitution is σ, we have

$$m/d = (1+t)^{-\sigma}(B-1) \tag{13}$$

From (11)-(13) we find that

$$m = y/[(1+t)^{\sigma}/(B-1)+1] = (N/B)/[(1+t)^{\sigma}/(B-1)+1] \tag{14}$$

This determines the imports of a representative bloc. Because trade must be balanced, however, imports equal exports, i.e. $m = m^{W}$. Thus the share of bloc exports in non-bloc income is

$$\begin{aligned} s &= m/y^{W} \\ &= m/[N(1-B^{-1})] \end{aligned} \tag{15}$$

Substituting and rearranging, we have

$$s = [(1+t)^{\sigma} + B - 1]^{-1} \tag{16}$$

so that the share of bloc exports in non-bloc income is decreasing in both the tariff rate and the number of blocs.

Figure 1 shows how equations (10) and (16) simultaneously determine the tariff rate and the export share for a given number of blocs B. The downward-sloping curve SS represents (16); it shows that the higher the tariff rate of a representative bloc, the lower the share of each bloc in rest-of-world income. The curve TT represents (10); it shows that the tariff rate levied by blocs is higher, the larger their export share. Equilibrium is at point E, where each bloc is levying the unilaterally optimal tariff.

Now consider the effect of a change in the number of blocs. Suppose, for example, that there are a series of negotiations between pairs of blocs that reduces the number of blocs from some initial number B_0 to $B_0/2$. It is immediately apparent what the result will be. For any given tariff rate, the effect of the reduction in B is to shift SS up; at a given t, each bloc will have a higher S. Thus in Figure 1 SS shifts up to S'S'. As a result, the tariff rate rises, as equilibrium shifts from E to E'.

It is clear that this process will reduce the volume of trade between any two countries that are in different blocs. Even at an unchanged tariff, the

removal of trade barriers between members of the expanded bloc would divert some trade that would otherwise have taken place between blocs. This trade diversion will be reinforced by the rise in the tariff rate.

Thus this model suggests that there is something to the concern of trade specialists that bilateral trade pacts may impair multilateral trade. The obvious next question, however, is whether this is actually bad for welfare.

3. The number of trading blocs and world welfare

The effect of the tariffs levied by trading blocs is to distort the consumer choice between intra-bloc and external goods. The utility function (1) may be written as

$$U = [N(1-B^{-1})c^{W})^{\theta} + NB^{-1}(c^{D})^{\theta}]^{1/\theta} \tag{17}$$

where c^{W} and c^{D} represent a province's consumption of a representative good produced inside and outside its trading bloc respectively. In turn, we may after a little manipulation show that

$$c^{W} = (B/N)/[(1+t)^{\sigma} + B - 1] \tag{18}$$

and that

$$c^D = [B(1+t)^{\sigma}/N]/[(1+t)^{\sigma} + B - 1] \tag{19}$$

Thus welfare equals

$$U = \{B/[(1+t)^{\sigma}+B-1]\}\{(1-B^{-1}) + B^{-1}(1+t)^{\sigma}\} \tag{20}$$

If trade were free, we would always have U = 1. Since the tariff rate is also a function of B, (20) together with (10) and (16) allows us to determine how welfare varies with the number of trading blocs.

Rather than attempting to prove general results here, since the model is so special in any case it makes more sense to adopt a numerical approach. This is especially true because the model has only one parameter: σ, the elasticity of substitution in world trade. Thus we can plot welfare as a function of B for a number of plausible values of σ. In what follows I use three values of σ: 2, a rather low estimate; 4, a somewhat high estimate; and 10, which is much higher than any empirical estimates.

As an initial step, Figure 2 plots equilibrium tariff rates as a function of B. We note that the tariff rate declines as B is increased, but not to zero, as already pointed out. Two other points are worth noting. First, the actual relationship between B and t is rather flat. This is because when there are fewer blocs, trade diversion tends to reduce interbloc trade, and thus

leads to less of a rise in s than one might expect. Second, except in the case of a very high σ the tariff rates are much higher than the actual rates of protection on trade among advanced nations. This is a useful caution on taking this model too seriously; actual relations among trading blocs are clearly far more cooperative than envisaged here.

We now turn to the level of welfare as a function of the number of trading blocs, shown in Figure 3. In each case world welfare is maximized with free trade, i.e., with B=1. The costs from lack of free trade are larger, the lower the elasticity of substitution. As suggested informally in section 1, the relationship between welfare and the number of blocs is U-shaped, with the pessimum at a moderate number of blocs. The surprise is that the pessimal number is the same for all plausible elasticities of substitution. Three trading blocs is the number that minimizes world welfare.

This is an interesting result, since many observers suggest that the world is in fact evolving precisely into a three-bloc economy. Before we put too much weight on the result, however, we should examine why we get it, and whether it is really plausible.

The basic explanation of the result is the following: in the model as stated so far, there are no natural trading blocs. That is, except for the effect of tariffs, each province tends to consume the products of all provinces equally. Even with tariffs, as long as there are more than a few trading blocs most of each province's consumption comes from provinces outside

its own bloc. The result is that as long as there are more than a few blocs, the trade diversion that results from consolidation outweighs the trade creation. Notice that if there were no tariffs, consumption from outside the bloc would exceed intra-bloc consumption as soon as the number of blocs exceeded two. The presence of tariffs alters this, but it is not surprising that the number of blocs at which trade diversion begins to outweigh trade creation is small -- though it is still fairly remarkable that the number always turns out to be three.

It is apparent from this intuitive story, however, that the result that a three-bloc world represents a pessimum is crucially dependent on the assumption that there are no natural trading blocs. The final argument of this paper will be that this result does not hold up if transportation costs give rise to the existence of natural regions.

4. Natural trading blocs

To get a fix on the issue of natural trading blocs, let us now imagine a world in which there is a structure of transportation costs. Specifically, we now assume that the N provinces in the world are located on three "continents", X,Y,and Z. Each continent contains N/3 provinces.

The structure of production and preferences will be assumed exactly the same as before. Also, we continue to assume that there are zero transportation

costs within each continent. However, we now suppose that there are transportation costs between continents. These take Samuelson's "iceberg" form: of a unit of a good shipped from one continent to another, only a fraction $1-\gamma$ arrives. Thus the continents in effect form natural trading regions, with the extent of natural regionalism determined by the transport cost γ.

Suppose next that each continent is initially divided into two equal-sized trading blocs. What will happen to world welfare if each bloc reaches an agreement with its neighbor, consolidating each continent into a single trading bloc?

We can immediately see that the result depends on inter-continental transportation costs. Consider first the case where $\gamma=0$, so that there are no transportation costs. In this case we are back to the symmetric case studied before, where three trading blocs represents the pessimal trading structure for all plausible parameter values. So in this case the bilateral deals end up reducing world welfare. On the other hand, consider the case where γ is close to one, so that transport costs are nearly prohibitive. In this case, intercontinental trade is unimportant. Thus in effect each continent is a world unto itself, which moves from two blocs to one -- which we know is welfare-improving.

The result, then, is that the assessment of regional trading arrangements depends on whether there is enough inherent regionalism in the structure of

transportation costs. If trading arrangements follow the lines of natural trading regions, they will have a much better chance of improving welfare than trade arrangements between "unnatural" partners.

5. Conclusions

Is bilateralism (or more accurately, regionalism) in trading arrangements bad? This paper shows, in the context of a highly stylized model, that it might be. While a world that consolidates into trading blocs could simultaneously reduce tariffs so as to avoid trade diversion, the optimal noncooperative behavior of the blocs is actually to increase external tariffs. Thus a reduction in interbloc trade is the normal outcome of the formation of regional trading blocs.

In the simplest version of the model presented here it is also highly likely that the net effect of regionalization will be to reduce world welfare. This is a fragile result: either a realistic appreciation of the role of transport costs (as shown here), or a recognition that real-world trade policies are set through negotiation, not through wholly noncooperative actions, might soften the result considerably.

Nonetheless, the analysis given here suggests at least some grounds for the widespread concern over the apparent trend toward regionalization of international trading arrangements.

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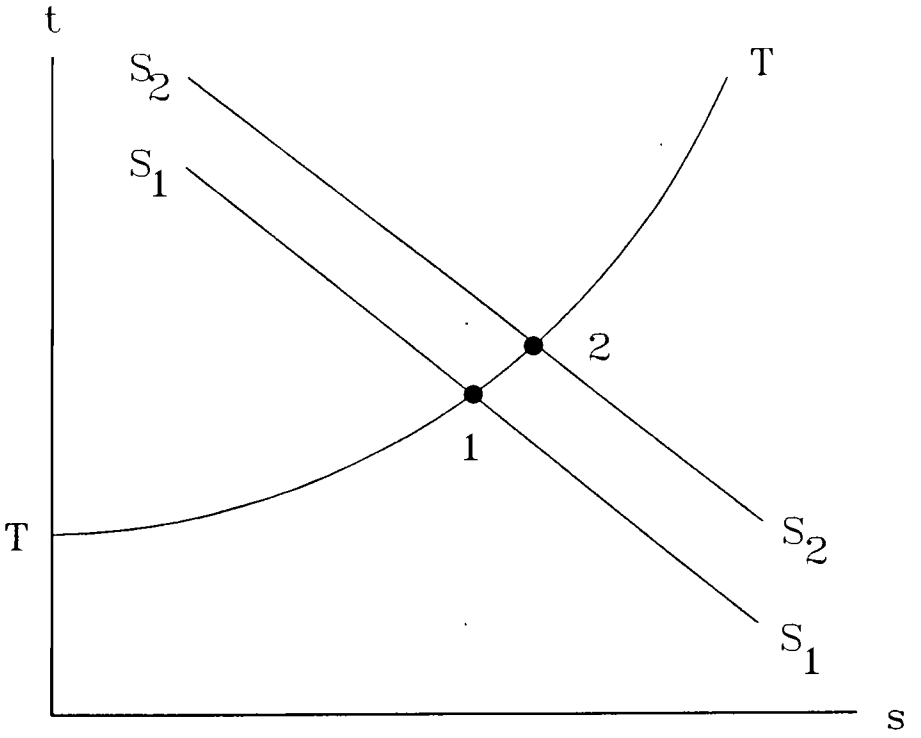


Figure 1

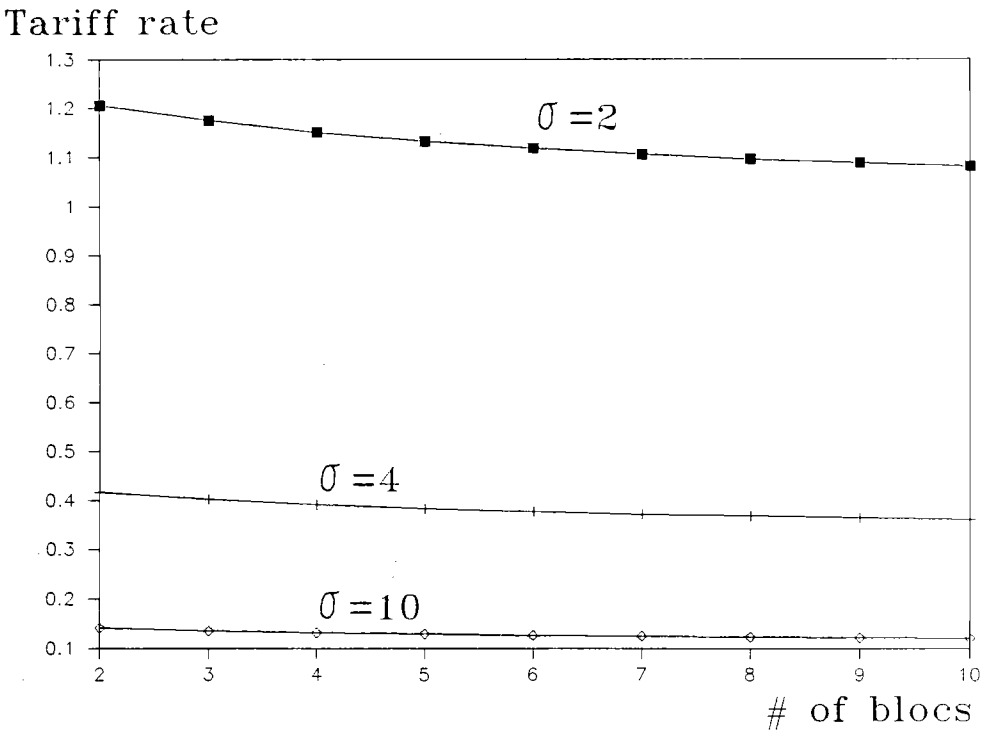
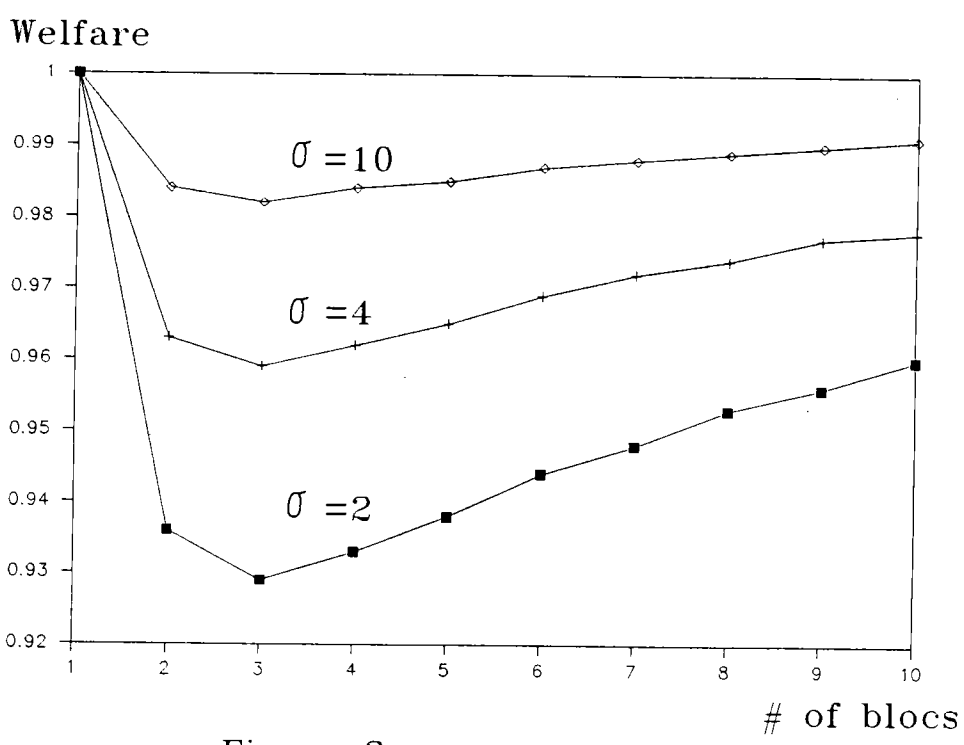

Tariff rate
1.3
1.2
1.1
1
0.9
0.8
0.7
0.6
0.5
0.4
0.3
0.2
0.1
σ =2
σ =4
σ =10
2
3
4
5
6
7
8
9
10
# of blocs

Figure 2


Welfare
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0.99
0.98
0.97
0.96
0.95
0.94
0.93
0.92
σ =10
σ =4
σ =2
1
2
3
4
5
6
7
8
9
10
# of blocs

Figure 3