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Tariff Reform: Some Pre-Strategic Consideration

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Abstract

We consider the implications of improving on *GATT/WTO* tariff negotiations both the most-favoured-nation (*MFN*) clause and the twin Paretian rules (that negotiations leave the trading world on its efficiency locus and each participating country in a preferred position). It is shown that the set of tariff reforms that satisfy both rules (*a*) is always non-empty, (*b*) might include no reforms that end in world-wide free trade, (*c*) always includes reforms that are incompatible with free trade and (*d*) might include reforms that support a Pareto-optimal and Pareto-improving allocation but also support other allocations with neither of those characteristics.

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GATT/WTO tariff negotiations are multilateral and piecemeal, subject to no formal rules other than the most-favoured-nation (*MFN*) clause. In the absence of additional rules, it is not possible to say anything definite about the necessary characteristics of feasible agreements. However one does discern an additional informal but widely acknowledged objective – that each participating country should on balance benefit from any agreement. Indeed this objective may be detected in the preamble to the *GATT* itself, for there the hope is expressed that the member countries will enter into “reciprocal and mutually advantageous arrangements.” Now by post-Paretian convention the wellbeing of a single country is said to increase as the result of an agreement if and only if no resident of that country is left worse off and at least one resident is left better off. In the present paper, therefore, our focus is on the characteristics of tariff reforms which accommodate both constraints, formal and informal, with the latter interpreted in the sense of Pareto and, for that reason, referred to as Pareto-improving. Indeed we go a step farther and require that tariff reforms leave the world on its contract locus, in a Pareto-optimal position. Thus our focus is on reforms which satisfy both the *MFN* rule and the two-edged Paretian rule.

It will be shown that the two rules restrict the set of feasible reforms, and in unexpected directions. For this purpose it suffices to focus on the familiar case of two commodities and two countries. Specifically, it will be shown that the set of tariff reforms which satisfy both the *MFN* and the Paretian rules

- (a) is always non-empty;
- (b) might include no reforms which end in world-wide free trade;
- (c) always includes reforms which are incompatible with free trade and, in particular, always includes reforms which impose negative import duties and/or positive export duties;
- (d) might include reforms which support a Pareto-optimal and Pareto-improving allocation but which also support other allocations without either of those characteristics.

Here (a) is our basic *existence* proposition for two-by-two economies. Conclusion (b) affirms that there are circumstances in which free trade is ruled out by the two rules. Thus the frequently heard remark that the *GATT* rules are conducive to free trade is inaccurate¹. Conclusion (c) states that, whether or not free trade is attainable, there are always available reforms which impose negative import duties and/or positive export duties. Finally, conclusion (d) draws attention to a fundamental obstacle to the *attainability* of particular allocations associated with tariff reform.

These findings establish a sharp contrast between redistribution attainable by means of distorting tariffs and redistribution attainable by non-distorting lumpsum Grandmont-McFadden-Grinols (*GMG*) compensation. Moreover they carry the possibly disturbing implication that an import subsidy and/or an export tax may be necessary elements of a pure tariff reform, that is, a tariff reform unaccompanied by international transfers. Finally they generalize the classical gains-from-trade proposition, in which the initial tariffs are jointly prohibitive and in which all new tariffs are zero; see Kemp and Wan (1972, Theorem 1). They also generalize a more recent gains-from-trade proposition, in which the initial tariffs are jointly prohibitive for each country and in which all new tariffs, whether on imports or exports, are non-negative and jointly prohibitive for no country; see Kemp and Wan (1972, Theorem 1'). However these generalizations are available only in a two-by-two setting; Kemp and Wan (2002) have provided a three-by-two example in which propositions (a) and (c), and therefore the above generalizations of the two gains-from-trade propositions, do not hold.

Of course, each trading country must accept a particular level of wellbeing and a tariff vector which helps support that level. To that extent, our finding relies on the *cooperative* behaviour of the trading countries. However even the classical proposition relies on each country to cooperate in trading freely or, at least, in imposing non-prohibitive tariffs.

In a well-known earlier contribution, Wolfgang Mayer (1981) studied some of the questions posed in the present paper. In particular he anticipated our conclusions (b) and (c). However Mayer confined himself to the special case in which, in the initial pre-reform equilibrium, each country imposes its optimal tariff and in which

both the pre-reform and post-reform equilibria are unique.

1. The basic model

Consider two pure-exchange economies, the home and the foreign, each with a single representative agent. Possibly, the two commodities differ only in the point in time at which they become available; thus international borrowing and lending are accommodated. The home country has an endowment of one unit of commodity 1; the foreign country has an endowment of one unit of commodity 2. The two agents share a symmetrical, increasing and strictly quasi-concave utility function; for example, they might share the function

$$u = x + y + \alpha xy \quad \alpha > 0$$

where x and y denote the amounts consumed.

In the unit Edgeworth box of Figure 1, E is the initial endowment point and the contract locus coincides with the diagonal joining the home and foreign origins, O_H and O_F . At all points on the contract locus, the two marginal rates of substitution are equal to one.

The unique free-trade equilibrium is represented by point C , where the two offer curves, EH and EF , intersect and where two dashed indifference curves, one for each country, are tangential. The equilibrium world price ratio is equal to one, and each country exports half of its endowment, consuming the vector $(0.5, 0.5)$.

Suppose alternatively that each country imposes a tariff on its imports. The tariffs are non-negative but otherwise arbitrary. Possibly but not necessarily they form a Nash solution to a tariff war; possibly one is optimal, the other zero; possibly they are jointly prohibitive. The tariff-distorted offer curves intersect at point e in the “lens” CE formed by the free-trade offer curves.

If, exceptionally, each tariff is initially imposed at the same rate, e must lie in the open segment EC . In that case both countries benefit from any equi-proportional reduction of the two tariffs; in particular, this is so if the tariffs are eliminated in

favour of free trade. Moreover, any Pareto-optimal and Pareto-improving point other than C can be reached by negotiating a tariff pair one element of which is positive, the other negative.

If, on the other hand, the two tariffs are initially imposed at different rates then it is possible that one country will be harmed by a retreat to free trade. Indeed this outcome will emerge if and only if the tariff-distorted point e lies in the interior of either of the shaded regions of Figure 1. If that condition is met, therefore, the two countries will not be able to agree on the free-trade outcome without a side payment by one country to the other. However, whether or not e lies in the interior of a shaded region, the countries will be able to reach a Pareto-optimal and Pareto-improving point by negotiating a tariff pair one element of which is positive, the other negative. Thus world-wide Pareto-optimality is attainable in a context of positive and negative import duties. In effect, the tariffs are *equivalent* to the side payment mentioned above. Thus we may add to the familiar roles of tariffs [in raising revenue, in redistributing income (Stolper-Samuelson) and in raising national wellbeing (Edgeworth-Bickerdike optimal tariffs)] the new *fiscal* role of extending (and camouflaging) foreign aid².

These are interesting findings since they suggest that negotiating countries should not constrain their negotiations by imposing equi-proportionality, thus ruling out import subsidies. Without recourse to import subsidies it is generally impossible to achieve a world allocation which is both Pareto-optimal and Pareto-improving; in particular, it is generally impossible to reach the free-trade point C without harming one country.

The proof of the proposition is straightforward. Consider any point e in a shaded region of Figure 1 and any Pareto-optimal and Pareto-improving point P . At P there is a shared marginal rate of substitution ($MRS=1$) which differs from the terms of trade ($p_2/p_1 \neq 1$). Suppose that P can be attained by means of an ordered semi-positive (non-negative and non-zero) pair of specific tariffs (t^H, t^F) . Then

$$(p_1 + t^F)/p_2 = p_1(p_2 + t^H)$$

Since the pair of tariffs is semi-positive, however,

$$(p_1+t^F)/p_2 > p_1/(p_2+t^H),$$

a contradiction.

2. Extensions

The analysis has been based on several simplifying assumptions. These can now be relaxed. Thus we have assumed that the two agents share the same symmetrical utility function, ensuring that the contract locus coincides with the positively sloped diagonal of Figure 1. The assumption is not necessary. Thus in Figure 2 the assumption is abandoned but our conclusion remains intact. In particular, from any point e , whether it is in the shaded or unshaded region of the lens EC , it is possible by adopting new tariffs to move to any point P which is Pareto-optimal and Pareto-preferred to e . If e lies in the straight segment CD and P coincides with C then the new tariffs will be zero; that is, free trade will obtain. Otherwise, one of the new tariffs must be positive, the other negative.

Nor is it necessary to assume that there is a single agent in each country. For we can interpret the indifference contours of Figures 1 and 2 as Scitovsky community indifference contours based on the individual contours of any number of heterogeneous agents, with a *GMG* scheme of lumpsum compensation ensuring that, in the general context of tariff-cum-subsidy reform as in the traditional special context in which free trade replaces autarky, the economies move to ever-higher Scitovsky contours. Thus point P in Figure 1 or Figure 2 is not only Pareto-optimal and Pareto-improving in relation to point e but readily implementable by means of *GMG* compensation.

We have focused on a particular endowment point. However it is possible to accommodate any initial endowment point compatible with autarkic subsistence and, by reinterpreting the indifference curves as *trade* indifference curves, even production.

It is also possible to accommodate initial tariffs that are jointly prohibitive. We need only recall that the free-trade allocation is Pareto-optimal and Pareto-preferred to E which, if the tariffs are prohibitive, coincides with e .

We have assumed that the free-trade and tariff-distorted world equilibria are unique. Suppose that this is not so. In particular, suppose that there are three free-trade equilibria, as in Figure 3. If the home country imposes a positive import duty, its offer at each terms of trade contracts (perhaps to zero), so that its new tariff-distorted offer curve OH' lies uniformly “inside” its free-trade offer curve OH . Similarly for the foreign country. Thus, corresponding to each pair of positive tariffs there is a pair of tariff-distorted offer curves. The curves may or may not intersect in the interior of the region inside both OH and OF ; and, if the curves do intersect, they may intersect less than or more than three times. Now consider any point e which is an interior equilibrium for some pair of positive tariffs. The shaded region of Figure 3 is associated with the free-trade equilibrium C_1 , the shaded region of Figure 4 is associated with the free-trade equilibrium C_2 , and the shaded region of Figure 5 is associated with the free-trade equilibrium C_3 . Evidently the three shaded regions are not disjoint; they overlap, so that point e might lie in as many as three shaded regions. But, however that may be, our proposition survives: Given e in a shaded region and any Pareto-optimal and Pareto-improving point P , there exists a new tariff pair, with one member positive, the other negative, that is compatible with world equilibrium at P ; and, given e in a non-shaded region, there exists a Pareto-optimal and Pareto-improving free-trade point C_j .

Of course, the mere adoption of a tariff pair compatible with equilibrium at P does not ensure that the world economy will settle at that point. And the mere adoption of free trade does not ensure that the economy will settle at a Pareto-optimal and Pareto-improving point C_i ; it might settle at point C_j ($j \neq i$), which is Pareto-optimal but not Pareto-improving. In other words, C_i need not be replicable.

Finally, it has been assumed that all tariffs are imposed on the imported commodity and are initially non-negative. Neither assumption is logically required; they have been adopted for simplicity only. As the reader may easily verify, the initial equilibrium point e may lie in any of the four quarters of Figure 1; and any change in the commodity to be taxed by a country will change the sign of the tax.

Thus we arrive at our proposition.

PROPOSITION: *Suppose that each of two economies produces and trades in two final goods subject to tariffs on its imported or exported goods. The tariffs may be positive or negative; some, but not all, may be zero; collectively, they may be prohibitive. Given any initial tariff-ridden equilibrium e , there exists a non-empty set $\Lambda(e)$ of feasible allocations which are Pareto-optimal and Pareto-improving. Any member λ of Λ is supportable by (i) an (e, λ) -dependent pair of tariffs and (ii) an information-parsimonious GMG scheme of lumpsum compensation in each country. If $\Lambda(e)$ contains the free-trade allocation then that allocation can be supported by free trade; all other allocations in $\Lambda(e)$ can be supported by pairs of tariffs, each pair with one member positive, the other negative.*

3. A final remark

We have focussed on several fundamental questions associated with tariff reform. All of the questions have been handled in terms of the conventional two-by-two theory of international trade. The same questions could have been posed in the broader context of m countries and n commodities without changing our main conclusions – that a free-trade agreement is not generally Pareto-improving and that a Pareto-improving and Pareto-optimal outcome generally requires that, in some countries, some imports be subsidized or some exports taxed. However in the broader context there is a new possibility – that a Pareto-improving and Pareto-optimal reform is not available. This possibility is discussed in Kemp and Wan (2002).

Footnotes

1. The *GATT* itself is silent on this question.

In his illuminating recent paper [Ohyama (2002, page 72)], Michihiro Ohyama makes the more moderate claim that “the basic rules of the *GATT/WTO* are economically meaningful and useful for creating freer trade.” However he interprets the “reciprocal and mutually advantageous attachments” of the preamble to the *GATT* quite strictly, in terms of mutual tariff reductions that hold relative world prices at their initial values. He points out that, if all tariffs are initially positive and remain positive at all stages of the negotiations, such reductions leave all negotiating countries better off. Evidently reductions constrained in this way can never yield a Pareto optimum. We are grateful to Professor Ohyama for his clarifying remarks on this point.

2. In general models, which accommodate any number of countries and any number of commodities, tariffs can play a fiscal role only under special assumptions; see Kemp and Wan (2002).

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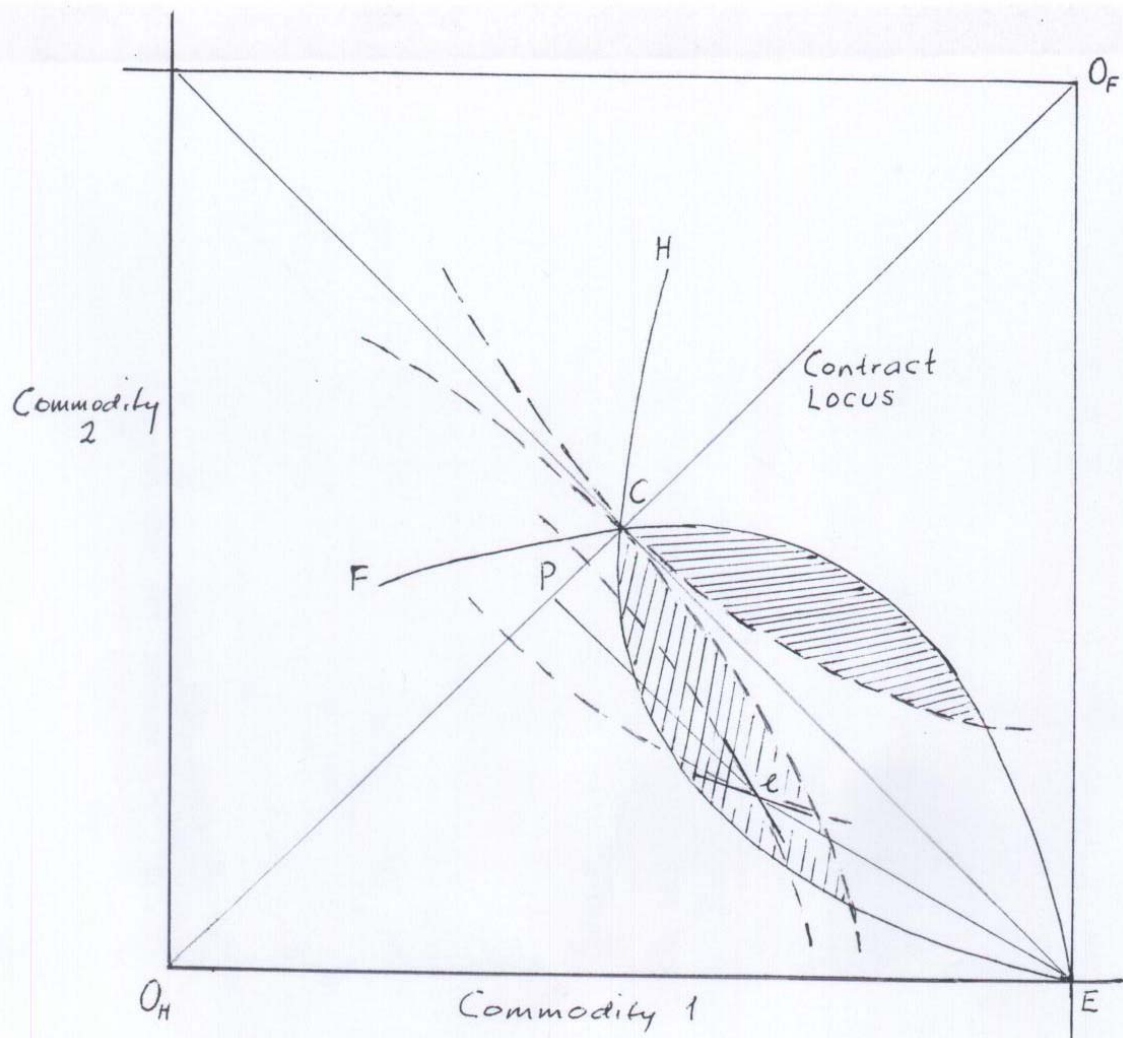


FIGURE 1

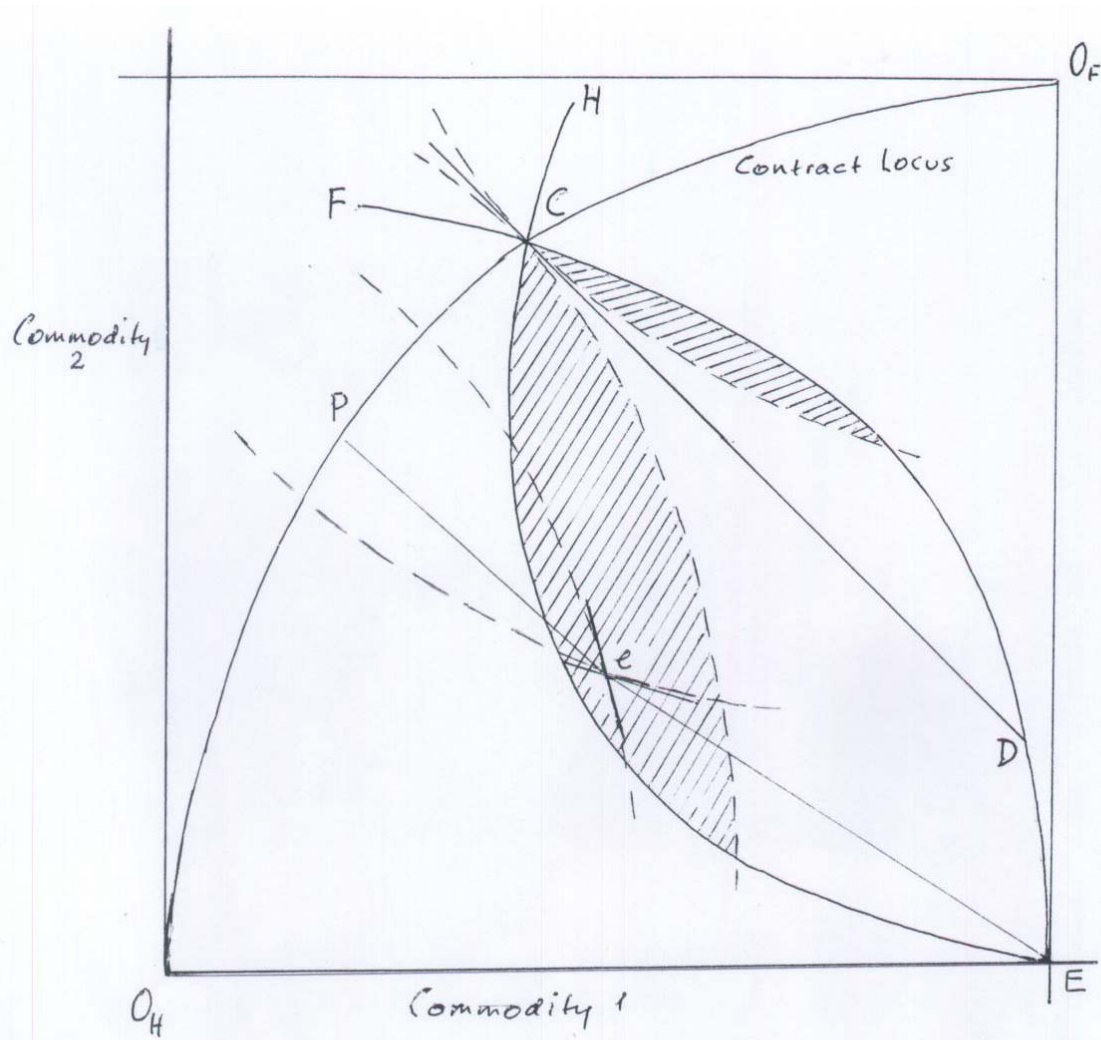


FIGURE 2

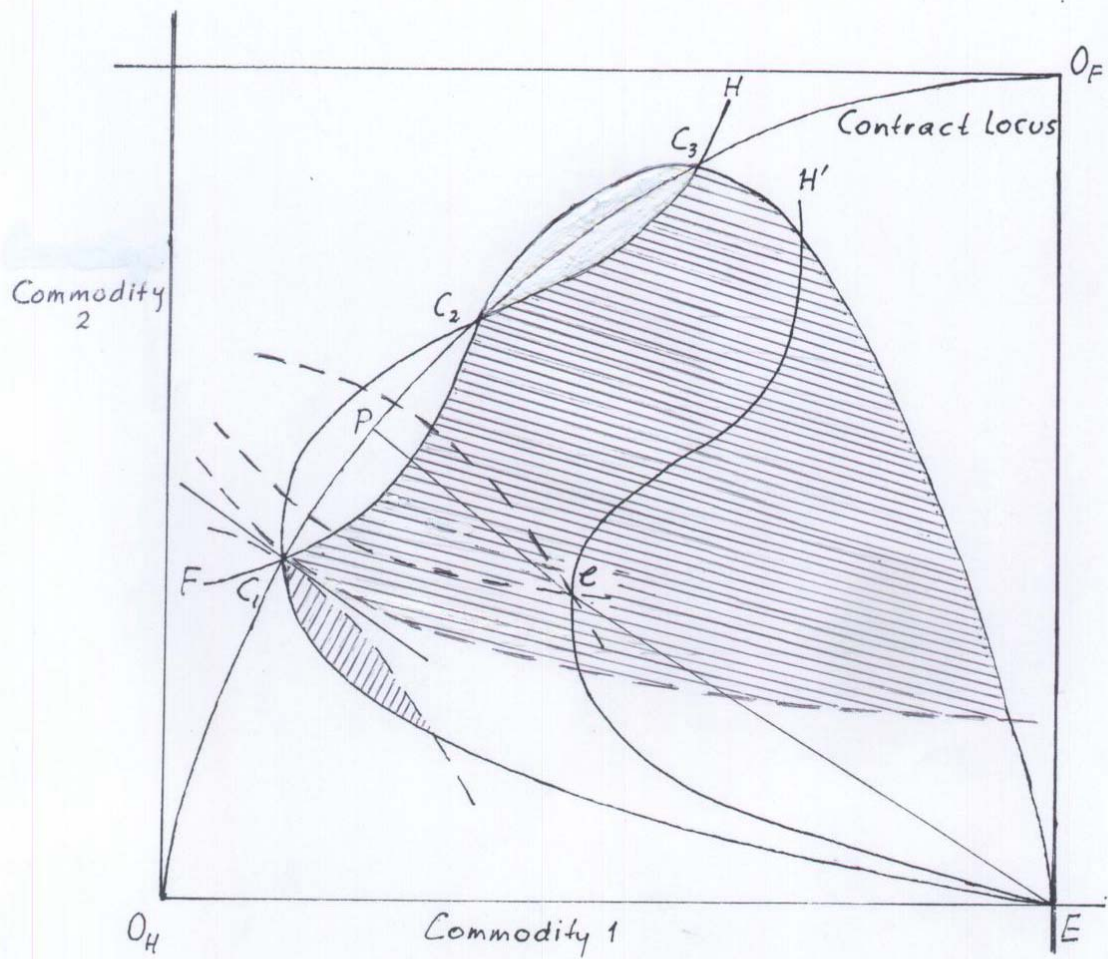


FIGURE 3

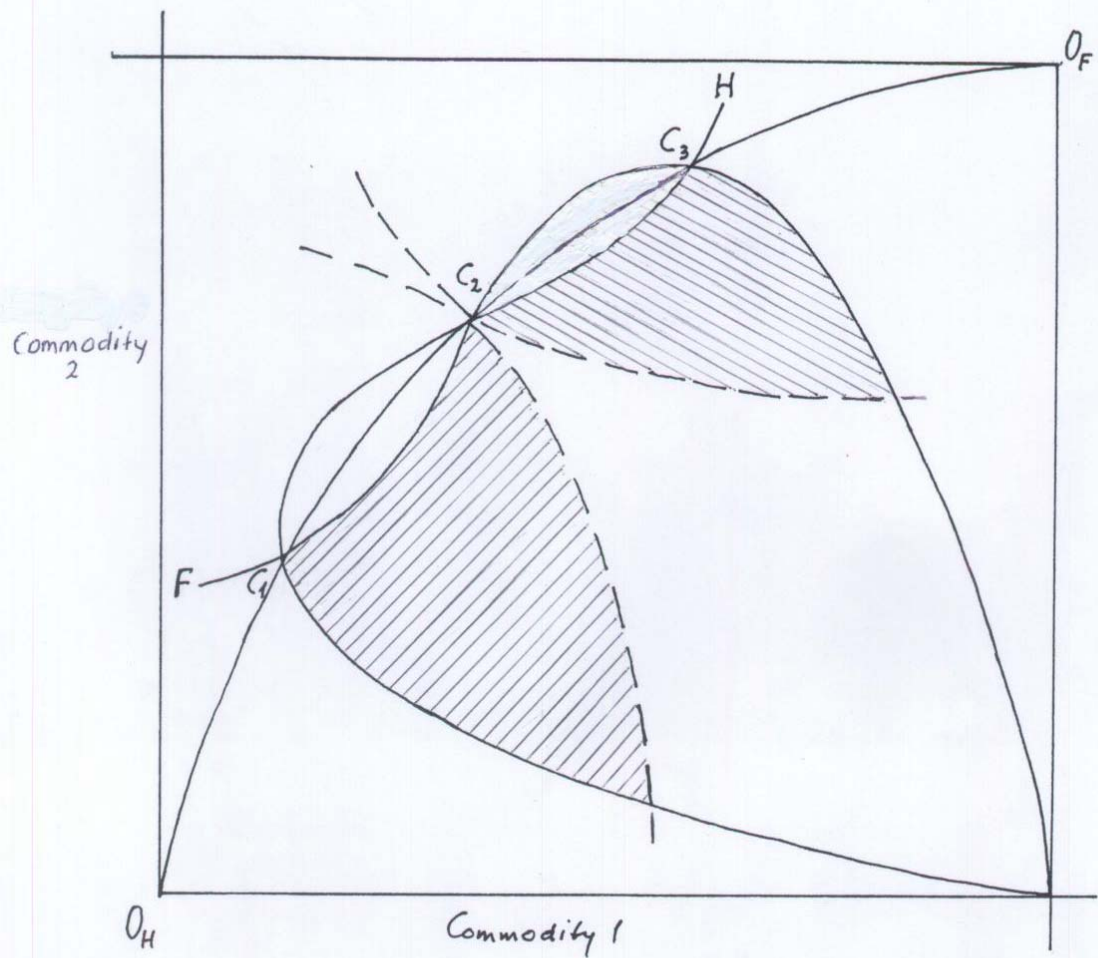


FIGURE 4

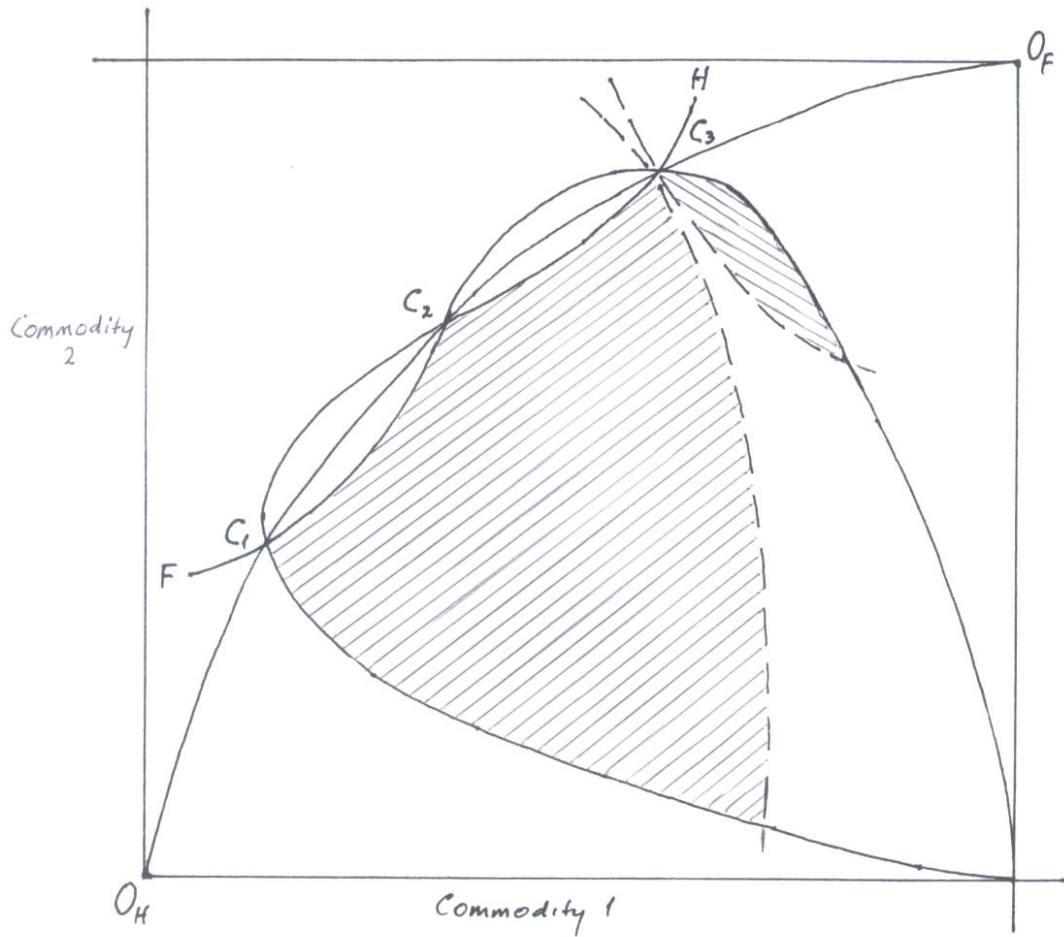


FIGURE 5

