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THE GAINS FROM TRADE LIBERALIZATION

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By

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Abstract: We consider trade liberalization in a multilateral trade model, where countries have identical, homothetic tastes but may have different constant returns to scale technologies that produce at least two goods from at least two factors .We introduce the notion of a world equilibrium with transfers and show that Debreu's coefficient of resource utilization or CRU defines a world equilibrium with transfers where all countries are better off in the free trade equilibrium, after trade liberalization, than they were in the distorted world equilibrium. In particular, after trade liberalization, the poor countries of the world are better off in the CRU world equilibrium with transfers than in the free trade world equilibrium without transfers.

Keywords: Standard trade model, Trade liberalization, Globalization, Coefficient of resource utilization

JEL Classification: D51, D58, D61, F11, F13

In the current debate on the merits of globalization, one of the issues is the distribution of the gains from trade liberalization across countries .How does the welfare of the poor countries of the world compare before and after trade liberalization? In what sense is the free trade world equilibrium after trade liberalization just or unjust? These are the policy issues addressed in this paper.

We begin our analysis with the standard model of trade. This model consists of two countries trading cloth and wine, where a strictly convex production possibility set and a representative consumer, endowed with capital and labor, characterize each country — see chapter 5 in Krugman and Obstfeld (2003) or equivalently consumers with identical homothetic tastes and a government that can redistribute income through lump sum transfers.

In our model, we assume that the production possibility set in each country derives from the constant returns to scale technologies of a firm producing cloth and a firm producing wine. The supply of capital and labor, the factors of production, is inelastic and mobile between firms within countries but immobile between countries — our analysis only requires that there are at least two factors of production. The tastes of each consumer are described by a neoclassical, homothetic utility function.

Initially, we do not assume that tastes or technologies in each country are the same. The importance of different constant returns to scale technologies as an explanation of intraindustry trade has recently been surveyed by Bhagwati and Davis (1999). We do assume that the free trade world equilibrium is unique for all factor endowments. If either country has imposed protective tariffs or other barriers to free trade, where autarky is a special case, then the distorted world equilibrium is not Pareto optimal. This paper addresses three questions:

(a) What is the pattern of trade after trade liberalization? That is, the removal of all barriers to free trade.

(b) Who gains from trade liberalization?

(c) What are the economic costs of protection?

In the presence of market imperfections such as monopolies, indirect taxes or tariffs, Debreu (1951) introduced α, the coefficient of resource utilization or CRU, as a measure of the resulting distortions. α is the smallest scalar multiple of the social endowment such that there exists an allocation relative to the reduced social endowment where each consumer is at least as well off as she was initially. This allocation is Pareto optimal relative to the reduced social endowment. We denote the unique supporting prices for the Pareto optimal allocation as P.

Since $\alpha < 1$, we compute the associated Pareto optimum, consisting of the Pareto optimal allocation and unique supporting prices P, in the standard trade model with the reduced social endowment of factors. Each consumer is at least as well off in the Pareto optimum as she was in the distorted world equilibrium. To carry out our analysis, we convert the reduced standard trade model into a pure exchange model.

The Pareto optimum in the reduced standard trade model defines the following pure exchange model: The social endowment for the pure exchange model is given by the sum of the Pareto optimal production plans, $Y = Y(H) + Y(F) \cdot (Y(H), Y(F))$ are the individual "endowments" for the home country and the foreign country, respectively. The supporting prices, P, and the Pareto optimal consumption bundles, $X(H)$ and $X(F)$, define each country's budget line in the Pareto optimum. The supporting prices, P, and the Pareto optimal production plans define each country's budget line in free trade. It follows from the assumption of homothetic tastes, that the consumption bundle of each country in free trade is a scalar multiple of each country's consumption bundle in the Pareto optimum — see Figure 1.

In chapter 12, Arrow and Hahn (1971) show in a world with two goods that if the competitive equilibrium is unique then the tatonnement price adjustment mechanism is globally stable. In cases A and B in figure 1, we use this theorem of Arrow and Hahn to derive the pattern of trade in the world equilibrium after trade liberalization and the welfare gains from trade liberalization. By Walras' law it suffices to determine the relative price of cloth that clears the world cloth market.

Theorem (1).

(a) If we consider cases A and B in Figure 1, then the pattern of trade at the supporting prices is the pattern of trade in the world equilibrium after trade liberalization.

(b) In each case, if the country with the favorable terms of trade prefers free trade to protection then this country is better off after trade liberalization than in the distorted equilibrium.

Proof. (a) There are two cases.

(1) If there is excess world demand for cloth at the supporting prices, then the relative price for cloth is below the equilibrium relative price, and it follows from revealed preference that the country exporting cloth in free trade will continue to export cloth along the tatonnement trajectory as the relative price of cloth increases monotonically to the equilibrium price level.

(2) If there is excess world supply of cloth at the supporting prices, then the relative price of cloth is above the equilibrium relative price, and again it follows from revealed preference that the country importing cloth in free trade will continue to import cloth along the tatonnement trajectory as the relative price of cloth decreases monotonically to the equilibrium price level.

(b) Again, there are two cases.

(1) If the free trade equilibrium relative price of cloth is higher than the supporting relative price of cloth and the cloth exporting country prefers free trade to its welfare in the distorted world equilibrium, then since free trade at the equilibrium prices involves an improvement in the terms of trade relative to the supporting prices, the welfare of the exporting country under free trade has to be higher than under protection. The same argument shows that its trading partner, the importing country, experiences a worsening of the terms of trade and is worse off under free trade.

(2) A similar argument holds for case (2) in part (a).

We scale the social endowments and the competitive allocation by $1/\alpha$. Invoking the constant returns to scale in technology and tastes, we see that the scaled competitive allocation together with the equilibrium prices in the reduced world economy is the unique competitive equilibrium in the original world economy after trade liberalization. Of course, this scaling does not alter the pattern of trade at the equilibrium prices. The effect of scaling on the welfare of the two countries after trade liberalization is more problematic.

There is both a determinate "price effect" and an ambiguous "income effect." Cases (1) and (2) in part (b) are the determinate "price effects" of trade liberalization. In both cases, scaling increases the welfare in each country, but in case (1) the importing country may still be worse off under free trade and in case (2) the exporting country may also be worse off under free trade. These are the ambiguous "income effects" of trade liberalization. If consumers have identical, homothetic tastes ,then there are only income effects.

It is worth noting in Figures 1 and 2 that if the production plans or "endowments" are on the budget line, at supporting prices through the Pareto optimal consumption point, then the resulting allocation of consumption and production between countries in the Pareto optimum is an equilibrium allocation, under free trade at the supporting prices, with respect to the reduced social endowment and the original social endowment. Differences in homothetic tastes between consumers do not matter.

If endowments are not on the budget line, at supporting prices through the Pareto optimal consumption point provided there is free trade at the supporting prices, then the resulting allocation of consumption and production between countries in the Pareto optimum is an equilibrium allocation with transfers, under free trade at the supporting prices, both with respect to the reduced social endowment and the original social endowment. Again, differences in homothetic tastes between consumers do not matter.

Both countries gain from trade liberalization in the world equilibrium with transfers derived from the Pareto optimum defined by α. In particular, after trade liberalization, the poor country in the world, i.e., the country where $P{\cdot}Y < P{\cdot}X$, is better off in the CRU world equilibrium with transfers than in the free trade world equilibrium without transfers. Hence the CRU equilibrium is more just, in the sense of Rawls (1971), than the free trade world equilibrium without transfers. Non-zero transfers suggest a role for international organizations such as the World Bank. An example is IDA, a subsidiary of the World Bank that makes highly subsidized loans, in effect grants, to LDC's. Such loans can be viewed as non-zero transfers between countries.

If we assume countries have identical tastes, but may have different constant returns to scale technologies, then we can consider models with more than two produced goods and give complete answers to our first two questions, under free trade at the supporting prices. Our key results derive from the following proposition.

Lemma. If both consumers in an Edgeworth box have identical and homothetic tastes then the contract curve is the diagonal of the box and every Pareto optimum has the same supporting prices — see Figure 2.

Theorem (2). If in both countries the tastes of consumers are homothetic and identical, as in the Hecksher — Ohlin model, see chapter 4 in Krugman and Obstfeld (2003), then

(a) the supporting prices, P, in the Pareto optimum, are the unique free trade equilibrium prices in the world economy after trade liberalization,

(b) the pattern of free trade at the supporting prices is the pattern of free trade in the world equilibrium after trade liberalization,

(c) consumers' welfare after trade liberalization is unambiguous.

Proof.

(a) By the Lemma every Pareto optimum in the pure trade model has the same supporting prices; uniqueness of the competitive equilibrium follows from the First Welfare Theorem — see chapter 5 in Bewley (2007). In this case, the supporting prices are the unique free trade equilibrium prices in the reduced world economy and, by scaling, the unique free trade equilibrium prices in the world economy after trade liberalization.

(b) See the proof of Theorem (1),

(c) Let $\beta(H) = P \cdot Y(H)/P \cdot X(H)$, then the home country is better off after trade liberalization if and only if $\beta(H) > \alpha$. Similarly, if $\beta(F) = P \cdot Y(F)/P \cdot X(F)$, then the foreign country is better off after trade liberalization if and only if $\beta(F) > \alpha$. Since one country receives a "subsidy" and the other a "tax" in moving from the free trade equilibrium to the Pareto optimum, — see the Second Welfare Theorem in chapter 5 in Bewley (2007) — at least the "taxed" country is better off and the "subsidized" country may also be better off. That is, either $\beta(H)$ or $\beta(F)$ is greater than one or both β's may be greater than α — see Figure 2.

Theorem (3). P and the associated factor prices $Q(H)$ and $Q(F)$ in the home and foreign country are the unique world prices after trade liberalization, if and only if they are the shadow prices for the constrained convex optimization problem — denoted OPT — that determines α. As such, they are the solutions of the Lagrange dual programming problem for OPT.

Proof. This is the convex programming problem for determining α.

OPT:

$$\begin{aligned} &\min \alpha \\ \text{s.t. } &U^H(C(H)) \geq U^H(C^H(d)) \\ &U^F(C(F)) \geq U^F(C^F(d)) \end{aligned}$$

$$\text{Shadow Prices} \begin{cases} P_W: & C_W(H) + C_W(F) \leq F_W^H(L_W^H, K_W^H) + F_W^F(L_W^F, K_W^F) \\ P_C: & C_C(H) + C_C(F) \leq F_C^H(L_C^H, K_C^H) + F_C^F(L_C^F, K_C^F) \\ Q_{:L}^H: & L_W^H + L_C^H = \alpha L^H \\ Q_K^H: & K_W^H + K_C^H = \alpha K^H \\ Q_L^F: & L_W^F + L_C^F = \alpha L^F \\ Q_K^F: & K_W^F + K_C^F = \alpha L^F \end{cases}$$

Proof. It is clear that Slater's constraint qualification is satisfied for the family of inequalities given above. The dual Lagrange problem is obtained by minimizing the Lagrangian for OPT, as a function of the primal variables and Lagrange multipliers, over the primal variables. The resulting Lagrange dual function is a concave function of the Lagrange multipliers. Lagrange multipliers are the shadow prices for the primal programming problem if and only if they are the optimal solutions to the Lagrange dual problem. That is, the maximization of the Lagrange dual function over the set of nonnegative Lagrange multipliers — see chapter 5 in Boyd and Vandenberghe (2004).

It follows from part (a) of Theorem (2) that the shadow prices are the unique free trade equilibrium prices.

Notice that the formulation of OPT and the computation of α depend only on the primitives of the standard trade model and the observable consumption bundles of the two countries in the distorted equilibrium. As such, $\alpha < 1$ accounts for all barriers to trade, including explicit market distortions, such as implicit taxation, quotas and tariffs and implicit non-market distortions such as labor laws, graft and corruption. To compute the solution to OPT we need only solve the Kuhn-Tucker conditions for the Lagrangian defined by OPT. The interior solutions of the Kuhn — Tucker conditions provide a simple proof of the next theorem that is the basis for our analysis. Theorem (4) is a special case of a general theorem of Debreu (1951).

Theorem (4).

(a) The solution of OPT defines a Pareto optimal allocation ($X(H)$, $X(F)$) with supporting prices P in the pure exchange model with individual endowments ($Y(H)$, $Y(F)$).

(b) $Y(H)$ and $Y(F)$ are profit maximizing output plans with respect to the shadow market prices $Q(H)$, $Q(F)$ and P.

(c) The transfers in the Second Welfare Theorem are $T(H) = P(Y(H) - X(H))$ and $T(F) = P(Y(F) - X(F))$. If $T(H) > 0$ then $T(H)$ is a "subsidy" to the Home country and if $T(F) < 0$ then $T(F)$ is a "tax" on the Foreign country.

Proof. The first order conditions for a Pareto optimum are:

$$\text{Equality of MRS} \quad \begin{cases} U_W^H / U_C^H = P_W / P_C \\ U_W^F / U_C^F = P_W / P_C \end{cases}$$

$$\text{Equality of MRTS} \quad \begin{cases} F_{W,L}^H / F_{W,K}^H = Q_L^H / Q_K^H = F_{C,L}^H / F_{C,K}^H \\ F_{W,L}^F / F_{W,K}^F = Q_L^F / Q_K^F = F_{C,L}^F / F_{C,K}^F \end{cases}$$

$$\text{Equality of MRS and MRT} \quad \begin{cases} F_{W,L}^H / F_{C,L}^H = P_W / P_C = F_{W,K}^H / F_{C,K}^H \\ F_{W,L}^F / F_{C,L}^F = P_W / P_C = F_{W,K}^F / F_{C,K}^F \end{cases}$$

They are a consequence of the interior Kuhn–Tucker conditions for the Lagrangian defined by OPT.

We now derive conditions for the home (or foreign country) to be better off after trade liberalization, under free trade at the supporting prices, than in the distorted equilibrium, when there are no transfers between countries.

Theorem (5).

(a) If $C(H)$ is the consumption bundle of the home country in the distorted equilibrium, $E(H)$ is her factor endowment and $Z(H)$ is her consumption bundle after trade liberalization, then a sufficient condition for the home country to be better off after trade liberalization than in the distorted equilibrium is: $Q(H)\cdot E(H) > P\cdot C(H)$. A similar condition holds for the foreign country.

(b) In the distorted equilibrium, $J(H)$ is the income of the consumer in the home country and R is the domestic prices of wine and cloth in the home country. If $I(H) = Q(H)\cdot E(H)$ in the free trade equilibrium and $W(\cdot)$ is the indirect utility function of the home country, then the home country gains from trade liberalization if and only if $W(P, I(H)) > W(R, J(H))$.

A similar result holds for the foreign country.

Proof.

(a) $P\cdot Y(H)/\alpha = Q(H)\cdot E(H)$ and $P\cdot Z(H) = P\cdot Y(H)/\alpha$, hence the optimal consumption bundle of the home country in the free trade equilibrium, after trade liberalization, is preferred to $C(H)$. A similar argument holds for the foreign country.

(b) follows from definition of indirect utility function and Theorem 3

As a corollary to part (a) of Theorem (4), if the distorted world equilibrium is autarky then both countries are better off in the free trade equilibrium than in autarky. This suggests that if the consumption of each country in the distorted equilibrium is sufficiently close to their consumption in autarky then both countries gain from trade liberalization.

To answer our final question, we return to Debreu (1951). He proposes both a real and a nominal measure of the economic cost of inefficiencies due to market distortions. His measure of the real cost of protection is $(1 - \alpha) \times$ (original social endowment). Since $\alpha < 1$, these are wasted real resources. Hence, in the distorted equilibrium the world uses more resources than necessary to satisfy consumers' demands. The supporting prices in the Pareto optimum define shadow prices for capital and labor in each country. If V is the value of the original social endowment at the shadow prices for factors, then Debreu's intrinsic valuation of the economic costs of protection is $(1 - \alpha) \times V$.

Given Debreu's interpretation of the coefficient of resource utilization as a scalar measure of wasted resources in the distorted world equilibrium, Theorem 2 supports the conventional wisdom that "gains to both countries from trade liberalization increases with the degree of protection." That is, we show in part (c) of Theorem (2) the likelihood that both countries gain from trade liberalization increases as the CRU decreases. A possible benchmark for mutually beneficial free trade is the value of the CRU for autarky. Both countries are likely to benefit from free trade if the CRU for the distorted equilibrium is close to the CRU for autarky. This intuition relates to our earlier remark on the degree of protection and the mutual gains from trade liberalization.

Notions of restricted trade, related to the CRU, for a small country in an open economy are discussed in chapter 14 of Anderson and Neary (2005). See Diewert (1983) for a general discussion of measures of waste in the production sector of a small country in an open economy and their relationship to the CRU. We are unaware of other analyses of trade liberalization, explicitly using the CRU, where world prices under free trade are endogenous.

We now extend our analysis to the multilateral trade model with many countries, many produced goods and many factors of production. All technologies are constant returns to scale. Since the CRU is less than one, we consider the associated Pareto optimum in the world economy with the reduced social endowment. Again we construct a pure exchange model from the Pareto optimal production plans, where the "endowment" of each country is her production plan.

What do we know from our previous analysis?

CONCLUSIONS

(1) If tastes are not homothetic and "endowments" are on the budget line at supporting prices through the Pareto optimal consumption point, then the resulting allocation of consumption and production between countries in the Pareto optimum is an equilibrium allocation, under free trade at the supporting prices, with respect to the reduced social endowment.

(2) If tastes are homothetic but not identical and endowments are not on the budget line, provided there is free trade at the supporting prices, then the resulting allocation of consumption and production between countries in the Pareto optimum is an equilibrium allocation with transfers, under free trade at the supporting prices, both with respect to the reduced social endowment and the original social endowment — see Figure 1.

(3) If tastes are homothetic and identical then the resulting allocation of consumption and production between countries in the Pareto optimum is an equilibrium allocation with transfers, under free trade at the supporting prices, both with respect to the reduced social endowment and the original social endowment — see Figure 2.

(4) In cases (2) and (3), the resulting pattern of trade in the Pareto optimum is the pattern of trade in the equilibrium allocation with transfers, under free trade at the supporting prices, both with respect to the reduced social endowment and the original social endowment. Moreover, all countries are better off in the equilibrium allocation with transfers, under free trade at the supporting prices, after trade liberalization than they were in the distorted equilibrium.

After trade liberalization, countries are either rich or poor relative to the free trade world equilibrium without transfers and the CRU world equilibrium with transfers. That is, country i is "poor" if $W^i < R \cdot (C^i / \alpha)$ and she prefers (C^i / α) over her consumption bundle in the free trade world equilibrium without transfers and "rich" otherwise. R is the vector of market prices in the free trade world equilibrium without transfers, W^i is the income of country i in this equilibrium and (C^i / α) is the consumption bundle of country i in the CRU world equilibrium with transfers .The existence of at least one "poor" country follows from the Pareto optimality of the CRU world equilibrium with transfers. After trade liberalization; the poor countries are better off in the CRU world equilibrium with transfers than they are in the free trade world equilibrium without transfers. That is, after trade liberalization, the CRU world trade equilibrium with transfers is more just, in the sense of Rawls (1971), than the free trade world equilibrium without transfers.

This argument does not require that tastes are identical or homothetic. We simply compute the Pareto optimum in the world economy with the original social endowment, where for each country i, $U^i(X^i) \geq U^i(C^i / \alpha), C^i$ is her consumption bundle in the CRU Pareto optimum in the world economy with the reduced social endowment ,and invoke the Second Welfare Theorem . Unfortunately, if the supporting prices for the CRU Pareto optimum, after trade liberalization, differ from the market prices in the free trade world equilibrium without transfers, then lump sum transfers are insufficient for realizing the equilibrium preferred by the poor countries of the world. Bilateral trade with identical, homothetic tastes is a very special case.

The derivation of the CRU for the general case and the proofs of (1) through (4) are in the appendix.

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APPENDIX

To facilitate the exposition and to make comparisons with CGE multilateral trade models – see Shoven and Whalley (1992) -- we limit discussion of multilateral trade models to analogues of the standard trade model, where technologies have constant returns to scale and representative consumers have homothetic tastes.

There are N countries, M produced goods and K factors of production. Each country is characterized by a strictly convex production possibility set for produced goods, where the MRT at a point on the PPF determines the MRTS of the factors used to produce that point, an endowment of the factors of production, and a neoclassical, homothetic utility function. The country's production possibility set is described by a function $G(Y, L)$, where the PPF = $\{(Y, L) : G(Y, L) = 0\}$ and the production possibility set = $\{(Y, L) : G(Y, L) \leq 0\}$. For all $t \geq 0$, if $G(Y, L) \leq 0$, then $G(tY, tL) \leq 0$,this is the constant returns to scale assumption.

For i, $i = 1, N$:

Let $C^i = (C_1^i, ..., C_M^i)$, consumption bundle of country i,
$Y^i = (Y_1^i, ..., Y_M^i)$, produced goods of country i, and
$L^i = (L_1^i, ..., L_K^i)$, factor endowments of country i.

The PPF of country i is $\{(Y^i, L^i) : G^i(Y^i, L^i) = 0\}$.

$U^i(C^i)$ is the neoclassical, homothetic utility function of country i.

$C^i(d)$ is the consumption of country i in the distorted equilibrium.

The optimization problem for determining α is denoted OPT:

$$\begin{aligned}
& \min \alpha \\
\gamma^i: \quad & \text{s.t. } U^i(C^i) \geq U^i(C^i(d)) \\
\mu^i: \quad & G^i(Y^i, \alpha L^i) \leq 0 \\
\lambda_j: \quad & \sum_{i=1}^{N} C_j^i = \sum_{i=1}^{N} Y_j^i \\
& C^i \geq 0,\ Y^i \geq 0,\ \alpha \geq 0
\end{aligned}$$

Kuhn–Tucker Conditions (KTC):

$$\begin{aligned}
C_j^i: \quad & \gamma^i U_j^i = \lambda_j \text{ for } i = 1, ..., N;\ j = 1, ..., M \\
Y_j^i: \quad & \mu^i G_{i,j}^i = \lambda_j \text{ for } i = 1, ..., N;\ j = 1, ..., M \\
\alpha: \quad & 1 = \sum_{i=1}^{N} \mu^i \sum_{\ell=1}^{K} G_{i,\ell}^i L_\ell^i \\
& \gamma^i \geq 0,\ \mu^i \geq 0,\ \lambda_j \geq 0 \text{ for } i = 1, ..., N;\ j = 1, ..., M
\end{aligned}$$

Theorem (6). If all solutions to the KTC for OPT are interior, then the allocation of consumption and production between countries is a Pareto optimum both with respect to the reduced social endowment and the original social endowment

Proof. Given our convexity assumptions, if suffices to check the marginal conditions for Pareto optimality in the two-sector model. That is, the equality of consumers' MRS between all pairs of produced goods, the equality of the MRT between all pair of produced goods, at the profit maximizing output on the PPF of each country, and the consumers' MRS between all pair of produced goods and the equality of firms' MRTS in each country producing pairs of goods. The shadow prices in the KTC determine the supporting prices P. The first two marginal conditions are immediate consequences of the first two KTC; just compute the MRS and the MRT for any pair of produced goods .In our model, the MRT at a point on a country's PPF uniquely determines the MRTS of the firms in the country that are producing the point. Hence we have a Pareto optimum with respect to the reduced social endowment with supporting prices P. This argument did not assume homothetic tastes and is a special case of Debreu (1951), so this is a proof of our first conclusion.

Scaling the Pareto optimal allocation of consumption and production by $1/\alpha$, we obtain a Pareto optimal allocation with respect to the original social endowment, where the supporting prices are P, given our assumptions of constant returns to scale technologies and homothetic tastes in all countries.

Invoking the Second Welfare Theorem, we can compute transfers such that the Pareto optimum is a world equilibrium with transfers, under free trade at the supporting prices, both with respect to the reduced social endowment and the original social endowment. This proves the second and third conclusions.

Corollary. If C_j^i, Y^i, α and γ^i, μ^i, λ_j, are solutions to the KTC for the Lagrangian defined by OPT, then $\{C^i\}_{i=1}^N$ is a Pareto optimal allocation with supporting prices $P = \{\lambda_1, \lambda_2, ..., \lambda_N\}$ in the pure exchange model, where the social endowment is $\sum_{i=1}^N Y^i$ and Y^i is the individual endowment of country i — see Figures 1 and 2.

The fourth conclusion follow from the corollary and scaling the allocation in the Pareto optimum by $1/\alpha$.

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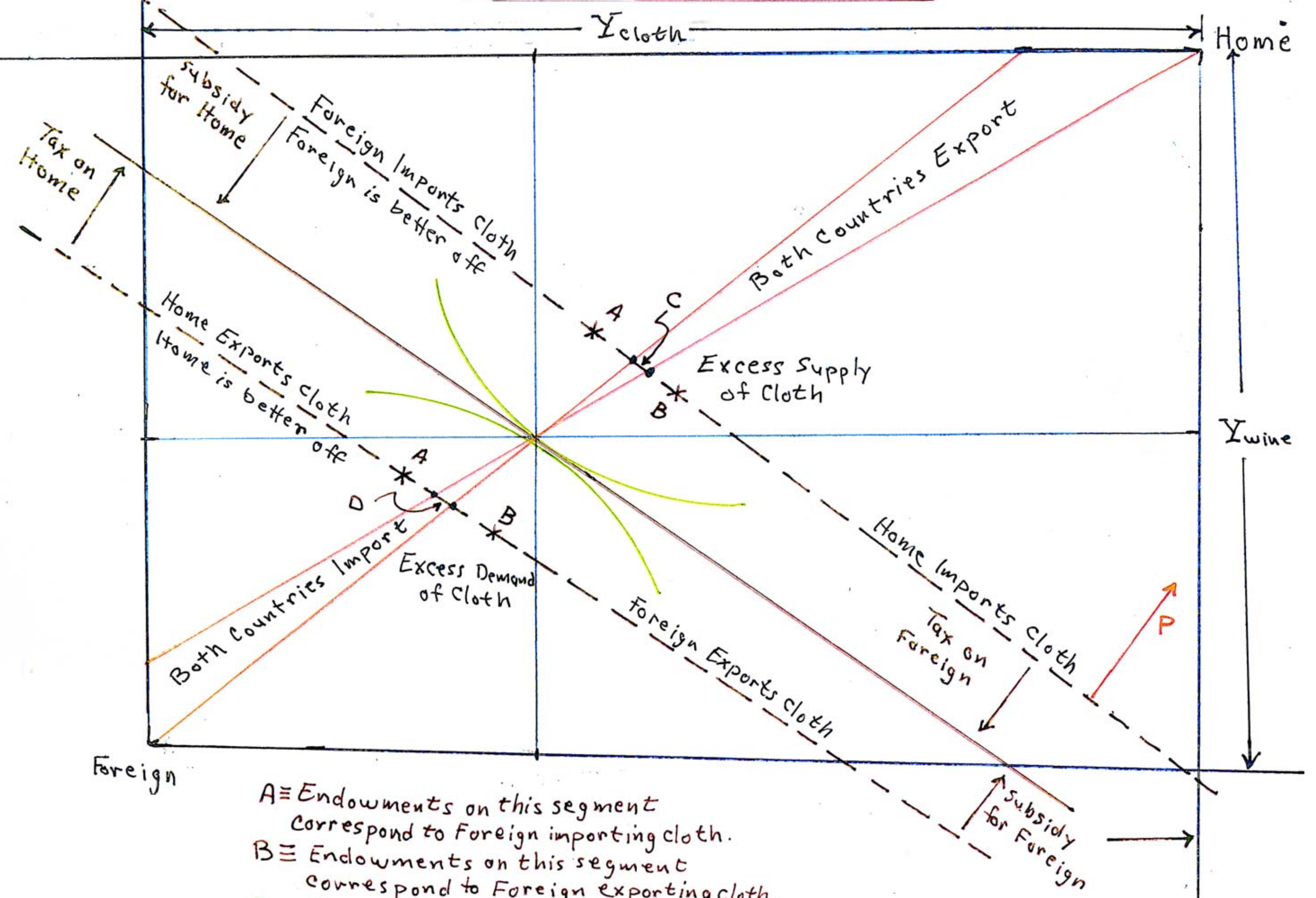
Figure 1 : Homothetic Tastes



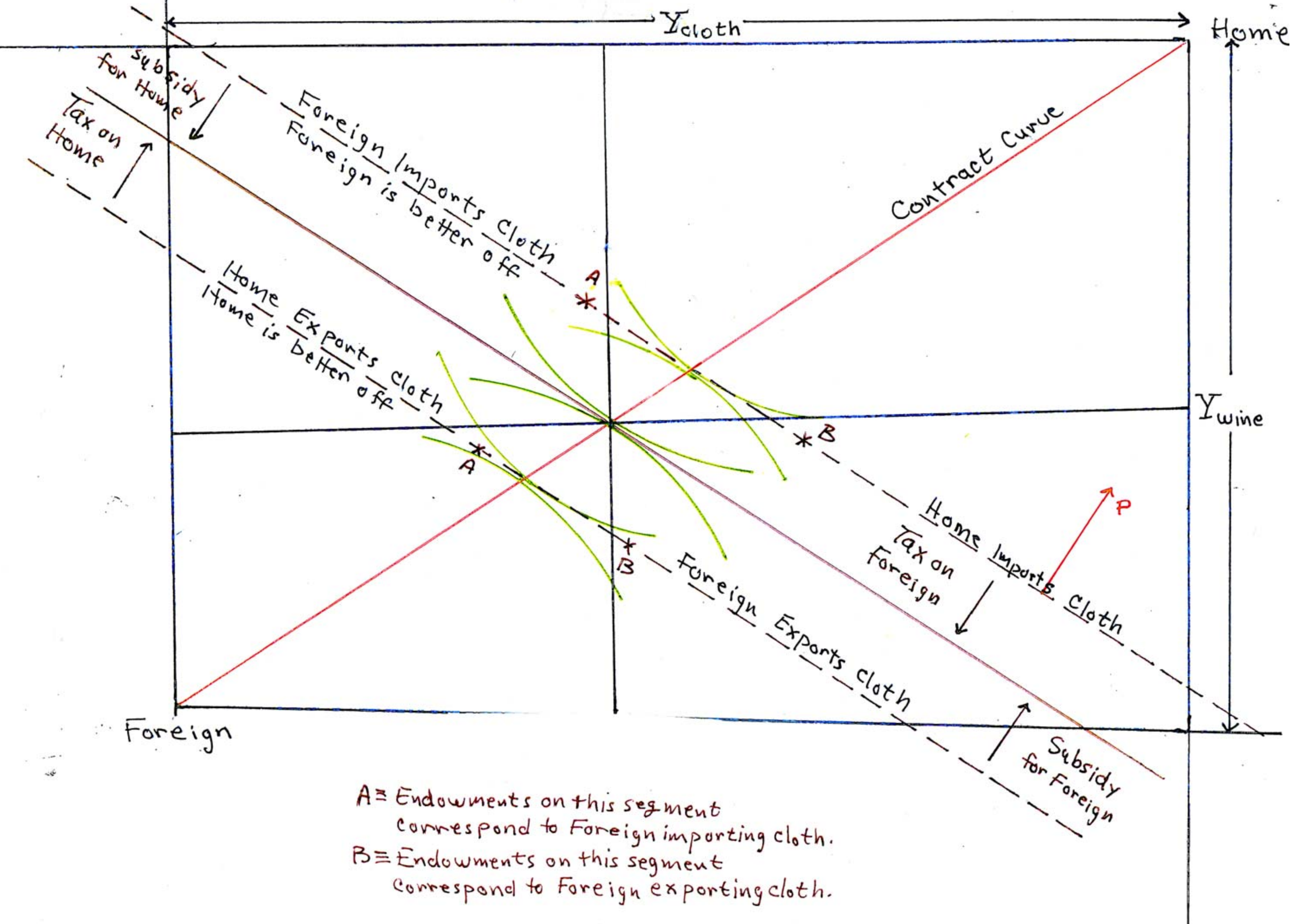
A ≡ Endowments on this segment correspond to Foreign importing cloth.

B ≡ Endowments on this segment correspond to Foreign exporting cloth.

C ≡ Endowments on this segment correspond to both countries exporting cloth.

D ≡ Endowments on this segment correspond to both countries importing cloth.

Figure 2 Identical, Homothetic Tastes



A ≡ Endowments on this segment correspond to Foreign importing cloth.
B ≡ Endowments on this segment correspond to Foreign exporting cloth.