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John Whalley

Randy Wigle

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John Whalley

and

Randall Wigle

This paper contains preliminary findings from research work still in progress and should not be quoted without prior approval of the author

DEPARTMENT OF ECONOMICS
THE UNIVERSITY OF WESTERN ONTARIO
LONDON, CANADA
N6A, 5C2

20040

ARE DEVELOPED COUNTRY MULTILATERAL TARIFF REDUCTIONS NECESSARILY BENEFICIAL FOR THE U.S.?

John Whalley
Department of Economics
University of Western Ontario
London Canada

and

Randall Wigle
Department of Economics
University of Saskatchewan
Saskatoon Canada

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Since the formation of the GATT in 1947, the belief underlying U.S. participation in GATT multilateral tariff reductions has been that they are beneficial to the U.S. This paper reports general equilibrium computations of the welfare effects of a 50% multilateral tariff reduction among developed countries using a seven region world trade model due to Whalley (1982). These results suggest that the U.S. loses by participating in such multilateral tariff reductions. While this policy change does not exactly correspond to the tariff reductions in the Kennedy and Tokyo Rounds, it is close enough in its main features that the results are relevant to the evaluation of U.S. policy options in future GATT negotiations.

The reasons for the result are three. Firstly, tariffs in developed countries are significantly higher on manufacturing rather than non-manufacturing products. The effect of multilateral tariff reductions among developed countries is to expand world consumption of manufactures and move the terms of trade against agricultural products and raw materials. Among the major developed economies, the U.S. is a larger exporter of non-manufacturing items than is either the EEC or Japan who, correspondingly, have more to gain from tariff reductions. Secondly, the limitation of multilateral cuts to developed countries implies that U.S. gains from reductions in tariffs abroad are smaller than would be true under worldwide multilateral reductions. Lastly, the trade elasticities used in the model imply that unilateral trade liberalization is a losing proposition for the U.S. since trade barriers are below optimal tariffs. Thus while the U.S. gains from trade barrier reductions abroad in other developed countries they lose from their own tariff reduction. When combined with the terms of trade effect against non-manufactures, the net effect in the model simulations is that the U.S. is a net loser. This result contrasts with calculations of welfare effects reported by Cline etal (1978), Baldwin, Multi and

Richardson (1980), Brown and Whalley (1980), and Deardorff and Stern (1979, 1981). The differences between present and earlier calculations are explored in the text.

1. Main Features of the Numerical General Equilibrium Model of Multilateral World Trade

The general equilibrium model used to calculate the welfare effects of multilateral tariff reductions for the U.S. is best thought of as a numerical specification of a Hecksher-Ohlin trade model, with the main departure from strict Hecksker-Ohlin being the assumption of product heterogeneity by region. The model is simple in structure although there is considerable detail incorporated. Only a brief overview is given here, the interested reader is referred to Whalley (1982). The model incorporates seven trading regions reflecting major participants in world trade;[1] the (nine-member) EEC, the U.S., Japan, Other Developed Countries (including U.S.S.R. and Eastern Europe), OPEC, Newly Industrialized Countries (NICs), and Less Developed Countries (LDCs). Six products are produced in each region; agriculture and food, mineral products and extractive ores, energy products (including oil), nonmechanical manufacturing, machinery and transport equipment (including vehicles) and services (including construction). Each of the first five goods is internationally traded with an assumed heterogeneity by region prevailing across production sources. The sixth commodity is non-traded for all regions. Two factors is each region (capital and labour) are considered, each of which is intersectorally mobile within the region but internationally immobile.

The model uses the 'Armington' assumption of product heterogeneity by region

[1] A more detailed description of a closely related earlier version of the model incorporating only the EEC, the US, Japan and a residual rest of the World is given in Brown and Whalley (1980), and Whalley (forthcoming).

to accommodate the statistical phenomenon of 'cross-hauling' in international trade data and to exclude complete specialization in production as a behavioral response in the model. This structure also enables empirically based import demand elasticities to be incorporated into the model specification.

Production and demand patterns in each of the regions revolve around the domestic and world price systems. Explicit demand functions are used which are derived from hierarchical CES/LES preference functions, and CES functions characterize production sets. Producers maximize profits and competitive forces operate such that in equilibrium all supernormal profits are competed away.

Use of hierarchical CES/LES demand and production functions enables empirical estimates of price elasticities in world trade to be incorporated into the model. These values guide parameter choice for inter-nest elasticity values in the CES functions (i.e., between 'similar' products subscripted by location and production). The LES features in the hierarchy allow income elasticities in import demand functions to differ from unity. Import demand elasticities are based on the compendium of estimates by Stern et al (1976), and are in the neighbourhood of unity for all regions.

For each product the market price in the model is the price at point of production. Sellers receive these prices, purchasers (of both intermediate and final products) pay these prices gross of tariffs, NTB tariff equivalents, and domestic taxes; no transportation costs are considered. Investment flows, interest and dividends, and foreign aid appear in the model with the second two of these being treated as income transfers. Foreign investment appears as capital goods purchased by agents located abroad.

An equilibrium in the model is a situation where demands equal supplies for all products, and in each industry a zero-profit condition is satisfied representing the absence of supernormal profits. In equilibrium, a zero foreign external sector balance condition (including investment flows, dividends, interest and transfers) applies for each region.

The general equilibrium model is used for counterfactual equilibrium analysis following the procedures which have become widespread in recent applied tax and trade general equilibrium models. A worldwide general equilibrium constructed from 1977 data is assumed to hold in the presence of pre-existing trade policies. The model is calibrated to the data set through a sequence of procedures which determine parameter values for the model functions consistent with the equilibrium restriction. Counterfactual analysis then proceeds for any specified policy change with a comparison between equilibria leading to the policy appraisal.

The calibration procedure involves first constructing a data set for a given year in a form which is consistent with the equilibrium solution concept of the model; a so-called benchmark equilibrium data set. Once assembled, parameter values for equations can be directly calculated from the equilibrium conditions using the calibration procedure described in Mansur and Whalley (1981). Since the model is being calibrated to a single data observation, elasticity parameters, and especially trade elasticities, are an important input into this process. The resulting model specification is capable of reproducing the benchmark data as an equilibrium solution of the model, and comparative statics can be performed with the model by computing new equilibria for alternative policy regimes and comparing new and benchmark equilibrium data. The benchmark equilibrium data set constructed for this purpose has the properties of a worldwide competitive equilibrium in that demands equal supplies for all products, no profits are made in any of the domestic industries, and each region is in zero external sector balance.

In calibrating the model to observed data, the same commodity classification is used for trade, domestic production, and final demands, with an approximate concordance used between different classification systems in basic sources. Problems of obtaining consistent data for all regions on uniform classification plus the dimensionalities involved in solving for an equilibrium in a seven region model limit the total dimension to six products and seven blocs; 42 products in total.

Once specified, the model is solved for a new general equilibrium for a policy or other change using a Newton method. This involves an estimate of the Jacobian matrix of excess factor demands and government budget imbalances. To evaluate the effects of trade policy changes a pairwise comparison is made between the benchmark and counterfactual equilibria. Welfare measures of the changes are based on Hicksian equivalent variations for each region.

2. Results

In Table 1 we report the annual welfare effects for the U.S. and other regions from 3 different 50% tariff reductions involving the EEC, U.S., Japan and other developed countries for the central case specification of our model. In each case, tariff cuts by each of the regions apply equally to their imports from all seven regions. The first case considers a unilateral 50% reduction in tariffs by the U.S., the second a multilateral 50% reduction by the U.S., the EEC and Japan, and the third a 50% multilateral reduction by the U.S., the EEC, Japan and Other Developed. Tariffs in the other regions (OPEC, Newly Industrialized Countries, and Less Developed Countries) remain unchanged in all cases.

The U.S. loses in all three cases, with the largest loss occuring in the unilateral case. While the losses are small when compared to U.S. GNP, they are each accompanied by a terms of trade deterioration for the U.S. As might have been expected, the deterioration is largest in the unilateral reduction case, next largest when three regions reduce tariffs, and smallest in the four region reduction case.

In the unilateral reduction case, the three other developed country regions gain from the U.S. tariff reduction. In the case ofan EEC- U.S.- Japanese multilateral reduction, the EEC loses and Japan gains. Large gains accrue to the other developed region reflecting their extensive trade with the tariff reducing regions. In the four region reduction case, the U.S. is the only developed region to lose. The loss to the LDC bloc in this case reflects the adverse terms of trade movement against agriculture and raw materials which accompanies the larger absolute reduction in tariffs on manufactures.

The result that the U.S. loses from multilateral tariff reductions differs significantly from other calculations of the effects involved . These appear to be due either to differences in model structure, or specification of the experiment involved. Both Cline et al (1978) and Baldwin, Mutti and Richardson (1980) show the U.S. gaining from multilateral trade liberalization, but in models which do not capture the terms of trade effect. Brown and Whalley (1980) also show the U.S. as gaining in multilateral tariff reductions in four-region version of the present model where the rest of the world applies the same reduction in tariff bariers as other regions. In related work, Whalley (forthcoming) presents results for cases where, in the four region context, different depths of cut are assumed for the rest of the world in an analysis of Tokyo Round tariff reductions. Where the reduction for the rest of the world is 25% or less, a similar result to that reported here of the U.S. suffering losses is obtained. Lastly, Deardorff and Stern (1981) report positive welfare effects for the U.S. akin to those in Brown and Whalley (1980).

Table 1

Welfare Effects of 3 Different 50% Reductions in Tariffs

1. 50% Unilateral Reduction in U.S. Tariffs

Annual Welfare Gain or Loss (Hicksian Equivalent Variations in $bill. 1977)

EEC	U.S.	Japan	Oth.Devel.	OPEC	NIC	LDC	Total
0.7	-2.2	0.5	0.8	0.1	0.2	0.0	0.1

Terms of Trade Impacts (% change, +ve indicates improvement)

EEC	U.S.	Japan	Oth.Devel.	OPEC	NIC	LDC
0.3	-1.2	0.5	0.3	0.0	0.0	0.1

2. 50% Multilateral Reduction in Tariffs by EEC, U.S. and Japan

Annual Welfare Gain or Loss (Hicksian Equivalent Variations in $bill 1977)

EEC	U.S.	Japan	Oth.Devel.	OPEC	NIC	LDC	Total
-1.6	-1.7	0.4	3.6	0.1	0.3	0.1	1.2

Terms of Trade Impacts (%change, +ve indicates improvement)

EEC	U.S.	Japan	Oth.Devel.	OPEC	NIC	LDC
-0.7	-0.9	0.5	1.3	-0.0	0.1	-0.0

3. 50% Multilateral Reduction in Tariffs by EEC, U.S., Japan, Oth. Devel.

Annual Welfare Gain or Loss (Hicksian Equivalent Variations in $bill. 1977)

EEC	U.S.	Japan	Oth. Devel.	OPEC	NIC	LDC	Total
0.7	-1.1	0.8	0.6	0.2	0.2	-0.2	1.2

Terms of Trade Impacts (% change, +ve indicates improvement)

EEC	U.S.	Japan	Oth. Devel.	OPEC	NIC	LDC
0.0	-0.7	0.8	-0.0	0.1	0.1	-0.1

Since the early 1930s, U.S. commercial policy has been dominated by a belief both in the desirability of free trade and the need to achieve that end through multilateral reductions in trade barriers. It was the U.S. that initiated bilateral negotiations to reduce protection in the 1930s, the U.S. that was the main driving force behind the setting up of the GATT in the late 1940s, and the U.S. that initiated the ensuing rounds of GATT negotiations. In spite of the growing frictions in recent years, the basic belief that multilateral trade liberalization is good for the U.S. appears to have remained unshaken as one of the tenets of foreign trade policy. While the results presented in this paper may be viewed as close to heretical in policy circles, their message is abundantly clear. Further participation in multilateral tariff reductions under a GATT framework of equal proportional reductions of tariffs on manufactures may not be in the U.S. national interest.

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