Centre for the Study of International Economic Relations Working Papers

Centre for the Study of International Economic Relations

1985

Regional Impacts of Tariffs in Canada: Preliminary Results from a Small Dimensional Numerical General Equilibrium Model

Richard Jones

John Whalley

Randall Mark Wigle

THE CENTRE FOR THE STUDY OF INTERNATIONAL ECONOMIC RELATIONS

WORKING PAPER NO. 8510C

REGIONAL IMPACTS OF TARIFFS IN CANADA: PRELIMINARY RESULTS

FROM A SMALL DIMENSIONAL NUMERICAL GENERAL EQUILIBRIUM MODEL

Richard Jones

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

REGIONAL IMPACTS OF TARIFFS IN CANADA: PRELIMINARY RESULTS
FROM A SMALL DIMENSIONAL NUMERICAL GENERAL EQUILIBRIUM MODEL

Rich Jones and John Whalley of the University of Western
Ontario and Randall Wigle of the University of Saskatchewan

Introduction

This paper presents some preliminary results from a small
dimensional applied general equilibrium model of U.S.-Canadian trade
which incorporates regional effects within Canada, and explores impacts
of changes in federal trade policies in Canada on interregional trade.
Unlike the recent general equilibrium work by Harris (1984) on Canadian
trade policy no scale economy features are included.

Regional Dimensions of Canadian Trade Policy

Since Confederation most Canadian policy debates have involved
discussion of their regional effects. Regional economic structures among
Canadian provinces are sharply differentiated, and as a result the impacts
of federal policies can be quite pronounced across regions.

Interprovincial trade is dominated by exports of manufactures
by Central Canada (Ontario and Quebec) to Western and Atlantic Canada in
return for resources and agricultural products. In international trade
Canada is a net importer of manufactures, and a net exporter of
resources.[1] Tariff protection is primarily on manufactures and has
traditionally been viewed as hurting the West and Atlantic Canada and
helping Central Canada since manufactures from Central Canada can be sold
to the West behind the protection of a tariff barrier.

Several policy elements besides the tariff have regional
effects. Price controls on energy products under the National Energy
Program hurt the West and help Central Canada. Grain transportation
subsidies help the West. Equalization payments transfer money to low
income provinces. Unemployment insurance benefits Atlantic Canada. The
federal income tax redistributes against higher income provinces. The
federal manufactures sales tax is thought to be harmful to Central Canada,
although this effect is partially offset by the manufacturing and
processing incentive in the corporate tax which lowers corporate tax

rates for manufacturing.

In short, Canada is a patchwork quilt of conflicting regional interests which come into play in debate on almost every national policy issue. Provinces not only have substantial autonomy but frequently form coalitions on an issue by issue basis to promote or block various policy initiatives. The role of the provinces in policy making in Canada is therefore pivotal and the perception as to what are the regional impacts of policies such as the federal tariff is key to the Canadian policy process.

Regional Impacts of the Canadian Tariff

The conventional wisdom on the regional impact of the Canadian tariff is that it increases the Canadian market price for manufactures, forcing Western buyers to pay higher gross of tariff prices for manufactures. In more popular discussion, the increased employment and income generated in Central Canada's manufacturing industry are seen as the major benefit of the tariff.

In the sparse academic literature on this subject, a small number of attempts have been made to both identify and quantify these effects. Most of this literature examines regional consequences of a unilateral abolition of tariffs by Canada, although it is well recognized in Canada there are sharp differences between a unilateral and multilateral tariff abolition.

One of the best known studies of regional impact is that by Hazledine (1978) who models Canada as a small open economy (SOE) in trade in resources and agricultural goods. His model seeks to have Canada as a price taker for resources and agriculture, but a price maker for manufactures. Estimates of changes in manufacturing shipments by province under a tariff change are generated using shipments elasticities, and form the basis for estimates of employment changes both nationally and by province. Changes in GNP, GDP, and GRP,[2] and changes in absorption[3] resulting from unilateral tariff abolition and other policy experiments are all calculated.

The regional consequences of unilateral tariff abolition by Canada in Hazledine's model are decreased employment and GRP in all regions (with the highest reduction in Atlantic Canada and Ontario). Somewhat paradoxically, absorption (in all regions) is financed by increased trade deficits (or reduced surpluses) since there is no trade balance condition to restrict imports. The policy implication seems to

be that tariffs help maintain employment everywhere in Canada, but reduce welfare in all regions since trade deficits fall and consumption is reduced. No clear interregional effects emerge from Hazledine's calculations since effects among regions are dominated by national effects.

A further study of interregional effects of the tariff is that by Pinchin (1979) who estimates that unilateral abolition of tariffs by Canada would lead to a 19 percent reduction in manufacturing employment (or a 4 percent reduction in total employment), along with a 10 percent devaluation of the Canadian dollar. The pattern of interregional transfers implied by the tariff is strongly in favour of Ontario and Quebec, at the expense of the Prairies, British Columbia and the Atlantic region. Aside from the interregional transfers which this reallocation would imply, the total losses estimated by Pinchin are so large that no federal government would reasonably be expected to argue for removing the tariff.

Despite the widely held popular perception that the tariff helps Central Canada and hurts Western and Atlantic Canada, no clear consensus emerges from this literature as to the regional impacts in Canada of a movement to a free trade, either unilaterally or bilaterally, or multilaterally. With the exception of Hazledine (1978) calculations do not come from exercises in which the equilibrium structure used and parameter values are clearly displayed. Much of the analysis involves mutually inconsistent assumptions making results difficult to interpret.

The Modelling Approach

The starting point for the present study is the 1974 Statistics Canada interprovincial trade data which give bilateral trade flows by product between provinces as well as trade outside Canada, and 1974 provincial input-output tables (also obtained from Statistics Canada) which give demand, production, and value added data by province. These are combined with information from a previously constructed 1972 micro consistent data set for Canada for general equilibrium tax policy due to St-Hilaire and Whalley (1983) to provide a micro consistent data set for regional applied general equilibrium analysis. Previous studies of the interregional effects of the federal tariff have had the disadvantage of working with provincial manufacturing shipments data which do not allow researchers to identify interprovincial trade in agriculture and resources, or the destination of interprovincial shipments. The destination by province of imports from outside Canada is also unknown from this

data.

We use our data in a small dimensional interregional applied general equilibrium model similar to the trade models described in Shoven and Whalley (1984). Three regions appear, representing Eastern Canada (Canada from the Manitoba-Ontario border East), Western Canada (Canada from the same border West) and a residual rest of the world (ROW). Both interregional and international trade occur in three commodities; manufactures, and non-manufactures, and services.

As with other bench mark data exercises, constructing this regional data set requires a number of modifications to meet the conditions required for micro consistency. Trade balance by region and demand supply equalities for commodities are all imposed. For example, it is necessary to assure that in the benchmark data the total production of Eastern Canada Manufacturing goods is exactly equal to direct and indirect use at home and abroad. A similar condition holds for all other products.

The computer code used is based on the seven-region international trade model used by Whalley (1982) to investigate trade liberalization issues in the global economy. This model is best thought of as an empirical analogue of a Hecksher-Ohlin trade model, although similar products produced by different regions are treated as qualitatively different (cars in the U.S. and Japan), and technology, which is country specific, is represented by different parameter values in each country. The model uses nested CES production and demand functions with the hierarchies chosen to allow the key substitution possibilities which enter the model. The assumption of product heterogeneity by country (the 'Armington' assumption) is used to accomodate cross hauling in bilateral trade flow data. This allows literature estimates of trade elasticities to be more adequately incorporated into the approach than is possible in a homogeneous products trade model. Two factors of production are considered and are mobile among industries within each region, but are immobile between regions.

In adapting the code to the regional issues analyzed here the Armington structure in demand is retained, as are the factor mobility assumptions. This formulation thus allows East and West manufactured and non-manufactured output to be close but not perfect substitutes, and the elasticity of substitution between types of commodities to be varied within the model.

One necessary modification arises from the treatment of each

region as an independent state in the international trade model. Revenues
generated by a given region's government equal expenditures of that same
authority. In the current model application the relevant constraint is
that total revenue accruing to the federal government from both the East
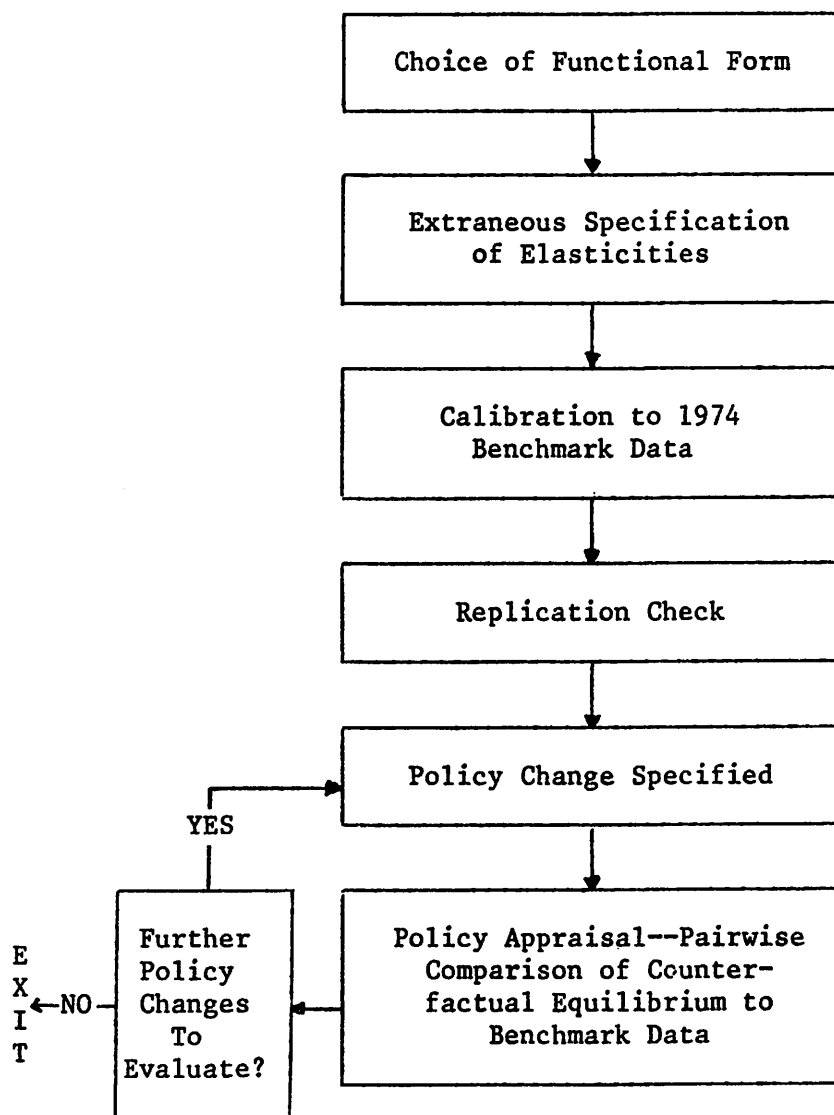and the West of Canada equal total expenditures by the federal government.

Three sources of revenue exist for the federal government in
this model. First, a manufacture's sales tax of 12 percent is levied on
final demand in both Canadian regions for all manufactured goods,
including imports from ROW. Second, there are factor taxes on capital
and labour in the three sectors in each of the Canadian regions. Similar
rates are assumed for both East and West, determined from the 1972 micro
consistent data set. Third, are the tariffs on non-manufactured and
manufactured goods imported from ROW.

At the time our modelling work was done, interprovincial
trade data was unavailable for years other than 1974 (it has since become
available for 1979). It was therefore impossible to estimate the
elasticities of demand in interprovincial trade for use in the model.
As a result, the same elasticities are assumed to apply to international
and interprovincial trade, with their values set equal to a best guess
estimate of these values from econometric literature. Values for the
rest of the world are assumed to be U.S. estimates. It is well known
that results of numerical trade models are sensitive to these elasti-
cities. Sensitivity analyses on results are therefore also performed.

In setting tariff rates in the model further problems arise.
For aggregate manufacturing our procedure for estimating the tariff rate
is to calculate the total duty payable on manufactured imports and
determine this as a proportion of the pre-tariff value of imports. This
procedure cannot be applied separately for each region, even though the
average tariff on manufactures in Eastern Canada tends to be lower than
that on manufactures in the West due to the higher proportion of autos
and auto parts in the former (duty free under the U.S.-Canada auto pact).
Subsequent sensitivity analysis also investigate this issue.

The procedure used to analyse policy changes in the model
follow the calibration/counterfactual equilibrium analysis approach
outlined in Mansur and Whalley (1984). This is outlined in Figure 1.
Once the functional forms for production and utility functions are
specified, and elasticities are set, the model is calibrated to the 1974
benchmark data set. Calibration determines the values of the share

Figure 1

Flow Chart of Model Use


```
          ┌─────────────────────────────────┐
          │    Choice of Functional Form    │
          └─────────────────────────────────┘
                          │
                          ▼
          ┌─────────────────────────────────┐
          │    Extraneous Specification     │
          │        of Elasticities          │
          └─────────────────────────────────┘
                          │
                          ▼
          ┌─────────────────────────────────┐
          │      Calibration to 1974        │
          │        Benchmark Data           │
          └─────────────────────────────────┘
                          │
                          ▼
          ┌─────────────────────────────────┐
          │        Replication Check        │
          └─────────────────────────────────┘
                          │
                          ▼
          ┌─────────────────────────────────┐
   YES───▶│     Policy Change Specified     │
          └─────────────────────────────────┘
                          │
                          ▼
┌──────────┐  ┌─────────────────────────────────┐
│ Further  │  │   Policy Appraisal--Pairwise    │
│ Policy   │  │   Comparison of Counter-        │
│ Changes  │◀─│   factual Equilibrium to        │
│ To       │  │   Benchmark Data                │
│Evaluate? │  └─────────────────────────────────┘
└──────────┘
```

E X I T ←NO─ Further Policy Changes To Evaluate?

parameters consistent with the elasticities and the observed data set,
using the assumption that firms are minimizing cost and consumers are
maximizing utility subject to their budget constraints. The accuracy of
the computer code is checked by confirming that the equilibrium outcomes
of cost minimization and utility maximization given the inferred share
parameters correspond to the original data. The desired policy change is
then introduced and a counterfactual equilibrium solution computed.
Policy appraisal proceeds using a pairwise comparison of the benchmark
equilibrium data and each counterfactual equilibrium solution.

Interregional Impacts of the Federal Tariff

Results are presented in Table I for a unilateral elimination
of tariffs in Canada . This change worsens both welfare and the terms of
trade for both the East and West, with an improvement in the Rest of the
World.

To a large extent these results reflect the values of the
trade elasticities used. Canada is not modelled as a small open economy,
and the ROW obtains a welfare gain at the expense of both Canadian
regions as a result of the unilateral tariff abolition by Canada. This
result can be seen simply as an illustration of the well known optimal
tariff argument that countries which can influence their terms of trade
will typically suffer a terms of trade deterioration by setting their own
tariff to zero. In this case, results suggest that existing tariffs in
Canada are closer to optimal tariffs than are zero tariffs.

The more interesting feature of Table I is that, while as
expected the East experiences a larger terms of trade deterioration, the
West appears to lose almost as much from tariff abolition as the East.
This is opposite to the belief that in relative terms the East gains
interregionally from the tariff at the expense of the West.

This latter result, however, is a direct consequence of the
treatment of government revenues in the model. Regions are given a share
of federal revenues equal to the amount paid by the region in the 1974
benchmark data. Since the East imports more than the West, their
relative contribution of tariff revenues to the federal government is
large. When Canadian tariffs are eliminated this reduces the West's
share of tariff revenues returned to them in lump sum form. This is
larger than the West's actual tariff payments, and thus the West loses
from tariff elimination. This result therefore suggests that the way in
which the revenues raised by the tariff are redistributed, interregion-

Table I

Unilateral Abolition of the Federal Tariff

A. Specification

- government revenue redistributed to regions proportional to regional benchmark contribution to total federal benchmark revenues

- elasticity of substitution between own and external goods (other province production) in both intermediate production and consumption set equal to literature estimates of national import price elasticities

B. Results

REGION	WELFARE EFFECTS[1]	TERMS OF TRADE CHANGE[2]
East	-.98	-4.20
West	-.88	-1.18
ROW	.11	4.75

---

[1] Change in welfare measured as the Hicksian equivalent variation as a percentage of GRP.

[2] Percentage change in index of export to import producer prices (+ve indicates improvement).

ally may be a more important determinant of the regional impacts of the
tariff than the conventionally discussed price effect from protection on
the interregional terms of trade.

In Table II we report results for the unilateral elimination
of tariffs by Canada where we make an adjustment to the model so that the
reduction in revenues received is proportional to each region's import
share. In this case, regional results are closer to the terms of trade
effects.

The implications of these results are that the federal tariff
typically will produce a relative interregional terms of trade improve-
ment in favour of the East, but the interregional income redistribution
effect from tariff revenues is also important.

Varying Elasticities of Substitution

In the results presented in Tables I and II, both Canadian
regions lose from unilateral tariff removal. These results largely
reflect our modelling of Canada with respect to ROW. Our A priori
expectation is that the elasticity of substitution between domestic and
imported commodities in demand and production in ROW should be important
for the welfare and terms of trade impacts produced by the model. In the
extreme case, if the elasticity of substitution between domestic products
and imports in the ROW is infinite, then Canada becomes a small open
price taking economy in which case the cost of the tariff is borne
exclusively by importing regions. At the opposite extreme, if Canada can
influence its terms of trade, a substantial improvement could result from
a tariff .

Results in Table III suggest that as the import domestic
substitution elasticity in ROW gets higher, the terms of trade effects
get smaller. The changes in the terms of trade effects for both the East
and the West are as might be expected for the various elasticity
specifications. The welfare results, however, suggest that the East
gains from the removal of tariff when ROW's elasticity is high. The West
continues to lose but by less.

Varying Tariff Rates by Region

In Table IV results using different relative tariffs by
region are reported. These analyses are included because, due to the
Auto Pact, the effective average tariff on Eastern imports of manufac-
tures is lower than that on Western imports. In these cases the relative
size of tariffs in the East is changed by reducing the tariff in the East

Table II

Unilateral Abolition of Tariffs by Canada with
Distribution of Federal Revenues Changes from Table I

	Revenue Returned to Region Proportional to Benchmark Contribution	Revenue/Change Distributed Proportional to Imports
	Welfare Effects (Hicksian Evs as % of GRP)	
East	- .98	-1.19
West	- .88	- .37
ROW	.11	0.11
	Terms of Trade Effects (% change, +ve indicates improvement)	
East	-4.20	-4.42
West	-1.18	-0.67
ROW	4.75	4.69

Table III

Sensitivity of Results to the
Import/Domestic Substitution Elasticity in ROW
(Unilateral Tariff Abolition with
Government Revenue Returned to Regions as in Table I)

	Elasticity Value		
	1.66[1]	10	20
Welfare Impacts (Hicksian Equivalent Variations as % of Income)			
East	− .98	.05	.19
West	− .88	-.30	-.27
ROW	.11	.03	.02
Terms of Trade (% change, +ve indicates improvement)			
East	-4.20	-.87	-.35
West	-1.18	-.09	-.25
ROW	4.75	.86	.45

---

[1]This is the value used in Tables I and II. Values of 1.3 were used for both East and West, and are also used in this table and those following.

Table IV

Sensitivity of Table I Results to Variations
in the Relative Size of East to West Tariffs
(Unilateral Tariff Abolition with
Government Revenue Redistributed to Regions)

	East Tariff equals West Tariff	East Tariff equals 1/2 West Tariff	East Tariff equals 1/4 West Tariff
A. Welfare Impacts			
(Hicksian EV as % of GRP)			
East	- .98	- .78	- .68
West	- .88	- .17	.20
ROW	.11	.07	.05
B. Terms of Trade Effects			
(% change, +ve indicates improvement)			
East	-4.20	-2.58	-1.75
West	-1.18	-0.79	-0.64
ROW	4.75	2.94	2.02

holding the Western tariff unchanged.

These results reflect the feature that the redistribution effect with tariffs is reversed between cases 1 and 3. In case 3, with considerably higher tariffs in the West, the majority of federal tariff revenues come from the West. When the tariff is eliminated, the West's contribution to national revenues drops by more than the transfer the West receives. In this case, unlike case 1, the West gains from the elimination of the tariff. These results therefore once again emphasize the importance of revenue redistribution effects in evaluating the regional impact of tariffs.

Conclusion

In this paper we report preliminary results from a small dimensional numerical general equilibrium model of U.S.-Canadian trade which incorporates regional effects within Canada. Under all assumptions of elasticities when revenues are redistributed by GRP, the West loses from unilateral abolition of Canadian tariffs, even though interregional terms of trade effects move relatively in their favour. Small positive gains result for the East only when the domestic import elasticity of substitution in the U.S. is high due to international terms of trade effects. The issue of how the federal government redistributes tariff revenues by region emerges as a central issue which crucially affects regional incidence.

ENDNOTES

     1. Although bilateral U.S.-Canadian trade in autos and auto parts under the free trade Auto Pact accounts for 25 percent of U.S.-Canadian trade.

     2. Gross Regional Product.

     3. Absorption equals consumption plus capital formation and is suggested by Hazledine as a measure of the welfare impacts of the tariff change.

References

Harris, R. with Cox, D. (1984). Trade, Industrial Policy and Canadian Manufacturing. Toronto, Canada: Ontario Economic Council

Hazledine, T. (1978). The Economic Costs and Benefits of the Canadian Federal Customs Union. In The Political Economy of Confederation, Ottawa: Economic Council of Canada

Mansur, A. & Whalley, J. (1984). Numerical specification of applied general equilibrium models: estimation, calibration and data. In Applied General Equilibrium Analysis, ed. H.E. Scarf & J.B. Shoven, Cambridge University Press.

Pinchin, H. (1979). The Regional Impact of the Canadian Tariff. Ottawa: Economic Council of Canada.

Shoven, J. & Whalley, J. (1984). Applied General Equilibrium Analysis of Tax and Trade Policy Issues, Journal of Economic Literature, 22, no. 3, 1007-1051.

St-Hilaire, F. & Whalley, J. (1983). A Micro Consistent Data Set for Canadian Tax Analysis. Review of Income and Wealth.

Whalley, J. (1980). Discriminating Features of Domestic Factor Tax Systems in a Goods Mobile-Factors Immobile Trade Model: An Empirical General Equilibrium Approach. Journal of Political Economy, 88, no. 6, 1177-1202.

——————— (1982). An Evaluation of the Tokyo Round Table Agreement Using General Equilibrium Computational Methods. Journal of Policy Modelling, 4, 341-361.

1981

8101C   Markusen, James R. Factor Movements and Commodity Trade as Compliments: A Survey of Some Cases.

8102C .   Conlon, R.M. Comparison of Australian and Canadian Manufacturing Industries: Some Empirical Evidence.

8103C   Conlon, R.M. The Incidence of Transport Cost and Tariff Protection: Some Australian Evidence.

8104C   Laidler, David. On the Case for Gradualism.

8105C   Wirick, Ronald G. Rational Expectations and Rational Stabilization Policy in an Open Economy

8106C   Mansur, Ahsan and John Whalley Numerical Specification of Applied General Equilibrium Models: Estimation, Calibration, and Data.

8107C   Burgess, David F., Energy Prices, Capital Formation, and Potential GNP

8108C D SJ   Jimenez, E. and Douglas H. Keare. Housing Consumption and Income in the Low Income Urban Setting: Estimates from Panel Data in El Salvador

8109C D SJ   Whalley, John Labour Migration and the North-South Debate

8110C   Manning, Richard and John McMillan Government Expenditure and Comparative Advantage

8111C   Freid, Joel and Peter Howitt Why Inflation Reduces Real Interest Rates

1982

8201C   Manning, Richard and James R. Markusen Dynamic Non-Substitution and Long Run Production Possibilities

8202C   Feenstra, Robert and Ken Judd Tariffs, Technology Transfer, and Welfare

8203C .   Ronald W. Jones, and Douglas D. Purvis: International Differences in Response to Common External Shocks: The Role of Purchasing Power Parity

8204C   James A Brander and Barbara J. Spencer: Industrial Strategy with Committed Firms

8205C   Whalley, John, The North-South Debate and the Terms of Trade: An Applied General Equilibrium Approach

8206C   Roger Betancourt, Christopher Clague, Arvind Panagariya CAPITAL UTILIZATION IN GENERAL EQUILIBRIUM

8207C   Mansur, Ahsan H, On the Estimation of Import and Export Demand Elasticities and Elasticity Pessimism.

8208C   Whalley, J. and Randy Wigle PRICE AND QUANTITY RIGIDITIES IN ADJUSTMENT TO TRADE POLICY CHANGES: ALTERNATIVE FORMULATIONS AND INITIAL CALCULATIONS

8209C DSU   Jimenez, E. SQUATTING AND COMMUNITY ORGANIZATION IN DEVELOPING COUNTRIES: A CONCEPTUAL FRAMEWORK

1982

8210C   Grossman, G.M. INTERNATIONAL COMPETITION AND THE UNIONIZED SECTOR

8211C   Laidler,D. FRIEDMAN AND SCHWARTZ ON MONETARY TRENDS – A REVIEW ARTICLE

8212C   Imam, M.H. and Whalley, J. INCIDENCE ANALYSIS OF A SECTOR SPECIFIC MINIMUM WAGE IN A TWO SECTOR HARRIS-TODARO MODEL.

8213C   Markusen, J.R. and Melvin, J.R. THE GAINS FROM TRADE THEOREM WITH INCREASING RETURNS TO SCALE.

8214C   INDUSTRIAL ORGANIZATION AND THE GENERAL EQUILIBRIUM COSTS OF PROTECTION IN SMALL OPEN ECONOMIES.

8215C   Laidler, D. DID MACROECONOMICS NEED THE RATIONAL EXPECTATIONS REVOLUTION?

8216C   Whalley, J. and Wigle, R. ARE DEVELOPED COUNTRY MULTILATERAL TARIFF REDUCTIONS NECESSARILY BENEFICIAL FOR THE U.S.?

8217C   Bade, R. and Parkin, M. IS STERLING M3 THE RIGHT AGGREGATE?

8218C   Kosch, B. FIXED PRICE EQUILIBRIA IN OPEN ECONOMIES.

1983

8301C   Kimbell, L.J. and Harrison, G.W. ON THE SOLUTION OF GENERAL EQUILIBRIUM MODELS.

8302C   Melvin, J.R. A GENERAL EQUILIBRIUM ANALYSIS OF CANADIAN OIL POLICY.

8303C   Markusen, J.R. and Svensson, L.E.O. TRADE IN GOODS AND FACTORS WITH INTERNATIONAL DIFFERENCES IN TECHNOLOGY.

8304C   Mohammad, S. Whalley, J. RENT SEEKING IN INDIA: ITS COSTS AND POLICY SIGNIFICANCE.

8305C DSU Jimenez, E. TENURE SECURITY AND URBAN SQUATTING.

8306C   Parkin, M. WHAT CAN MACROECONOMIC THEORY TELL US ABOUT THE WAY DEFICITS SHOULD BE MEASURED.

8307C   Parkin, M. THE INFLATION DEBATE: AN ATTEMPT TO CLEAR THE AIR.

8308C   Wooton, I. LABOUR MIGRATION IN A MODEL OF NORTH-SOUTH TRADE.

8309C   Deardorff, A.V. THE DIRECTIONS OF DEVELOPING COUNTRIES TRADE: EXAMPLES FROM PURE THEORY.

8310C   Manning, R. ADVANTAGEOUS REALLOCATIONS AND MULTIPLE EQUILIBRIA: RESULTS FOR THE THREE-AGENT TRANSFER PROBLEM.

8311C DSU   Mohammad, S. and Whalley, J.   CONTROLS AND THE INTERSECTORAL TERMS OF TRADE IN INDIA.

8312C   Brecher, Richard A. and Choudhri, Ehsan U.   NEW PRODUCTS AND THE FACTOR CONTENT OF INTERNATIONAL TRADE.

8313C   Jones, R.W., Neary, J.P. and Ruane, F.P.   TWO-WAY CAPITAL FLOWS: CROSS-HAULING IN A MODEL OF FOREIGN INVESTMENT.

8314C DSU   Follain, J.R. Jr. and Jimenez, E.   THE DEMAND FOR HOUSING CHARACTERISTICS IN DEVELOPING COUNTRIES.

8315C   Shoven, J.B. and Whalley, J.   APPLIED GENERAL EQUILIBRIUM MODELS OF TAXATION AND INTERNATIONAL TRADE.

8316C   Boothe, Paul and Longworth David.   SOME IRREGULAR REGULARITIES IN THE CANADIAN/U.S. EXCHANGE MARKET.

8317C   Hamilton, Bob and Whalley, John.   BORDER TAX ADJUSTMENTS AND U.S. TRADE.

8318C   Neary, J. Peter, and Schweinberger, Albert G.   FACTOR CONTENT FUNCTIONS AND THE THEORY OF INTERNATIONAL TRADE.

8319C   Veall, Michael R.   THE EXPENDITURE TAX AND PROGRESSIVITY.

8320C   Melvin, James R.   DOMESTIC EXCHANGE, TRANSPORTATION COSTS AND INTERNATIONAL TRADE.

8321C   Hamilton, Bob and Whalley, John.   GEOGRAPHICALLY DISCRIMINATORY TRADE ARRANGEMENTS.

8322C   Bale, Harvey Jr.   INVESTMENT FRICTIONS AND OPPORTUNITIES IN BILATERAL U.S.-CANADIAN TRADE RELATIONS.

8323C   Wonnacott, R.J.   CANADA-U.S. ECONOMIC RELATIONS—A CANADIAN VIEW.

8324C   Stern, Robert M.   U.S.-CANADIAN TRADE AND INVESTMENT FRICTIONS: THE U.S. VIEW.

8325C   Harrison, Glenn, H. and Kimbell, Larry, J.   HOW ROBUST IS NUMERICAL GENERAL EQUILIBRIUM ANALYSIS?

8326C   Wonnacott, R.J.   THE TASK FORCE PROPOSAL ON AUTO CONTENT: WOULD THIS SIMPLY EXTEND THE AUTO PACT, OR PUT IT AT SERIOUS RISK?

8327C   Bradford, James C.   CANADIAN DEFENCE TRADE WITH THE U.S.
Conklin, David.   SUBSIDY PACTS.
Rugman, Alan M.   THE BEHAVIOUR OF U.S. SUBSIDARIES IN CANADA: IMPLICATIONS FOR TRADE AND INVESTMENTS.

8328C   Boyer, Kenneth D.   U.S.-CANADIAN TRANSPORTATION ISSUES.

8329C   Bird, Richard M. and Brean, Donald J.S. CANADA-U.S. TAX RELATIONS: ISSUES AND PERSPECTIVES.

8330C   Moroz, Andrew R.   CANADA-UNITED STATES AUTOMOTIVE TRADE AND TRADE POLICY ISSUES.

8331C   Grey, Rodney de C. and Curtis, John.   INSTITUTIONAL ARRANGEMENTS FOR U.S.-CANADIAN NEGOTIATIONS.   PART I: CANADA-U.S. TRADE AND ECONOMIC ISSUES: DO WE NEED A NEW INSTITUTION?   PART II: INSTITUTIONAL ARRANGEMENTS FOR MANAGING THE CANADA-U.S. ECONOMIC RELATIONSHIP.

1984

8401C   Harrison, Glenn W. and Manning, Richard.   BEST APPROXIMATE AGGREGATION OF INPUT-OUTPUT SYSTEMS.

8402C   Parkin, Michael.   CORE INFLATION: A REVIEW ESSAY.

8403C   Blomqvist, Åke, and McMahon, Gary.   SIMULATING COMMERICAL POLICY IN A SMALL, OPEN DUAL ECONOMY WITH URBAN UNEMPLOYMENT: A GENERAL EQUILIBRIUM APPROACH.

8404C   Wonnacott, Ronald.   THE THEORY OF TRADE DISCRIMINATION: THE MIRROR IMAGE OF VINERIAN PREFERENCE THEORY?

8405C   Whalley, John. IMPACTS OF A 50% TARIFF REDUCTION IN AN EIGHT-REGION GLOBAL TRADE MODEL.

8406C   Harrison, Glenn W.   A GENERAL EQUILIBRIUM ANALYSIS OF TARIFF REDUCTIONS.

8407C   Horstmann, Ignatius and Markusen, James R.   STRATEGIC INVESTMENTS AND THE DEVELOPMENT OF MULTINATIONALS.

8408C   Gregory, Allan W. and McCurdy, Thomas H.   TESTING THE UNBIASEDNESS HYPOTHESIS IN THE FORWARD FOREIGN EXCHANGE MARKET: A SPECIFICATION ANALYSIS.

8409C   Jones, Ronald W. and Kierzkowski, Henryk.   NEIGHBORHOOD PRODUCTION STRUCTURES WITH APPLICATIONS TO THE THEORY OF INTERNATIONAL TRADE.

8410C   Weller, Paul and Yano, Makoto.   THE ROLE OF FUTURES MARKETS IN INTERNATIONAL TRADE: A GENERAL EQUILIBRIUM APPROACH.

8411C   Brecher, Richard A. and Bhagwati, Jagdish N.   VOLUNTARY EXPORT RESTRICTIONS VERSUS IMPORT RESTRICTIONS: A WELFARE-THEORETIC COMPARISON.

8412C   Ethier, Wilfred J. ILLEGAL IMMIGRATION.

8413C   Eaton, Jonathon and Gene M. Grossman. OPTIMAL TRADE AND INDUSTRIAL POLICY UNDER OLIGOPOLY.

8414C   Wooton, Ian. PREFERENTIAL TRADING AGREEMENTS - A 3xn MODEL.

8415C   Parkin, Michael. DISCRIMINATING BETWEEN KEYNESIAN AND CLASSICAL THEORIES OF THE BUSINESS CYCLE: JAPAN 1967-1982

8416C   Deardorff, Alan V. FIRless FIRwoes: HOW PREFERENCES CAN INTERFERE WITH THE THEOREMS OF INTERNATIONAL TRADE.

8417C   Greenwood, Jeremy. NONTRADED GOODS, THE TRADE BALANCE, AND THE BALANCE OF PAYMENTS.

8418C   Blomqvist, Ake and Sharif Mohammad. CONTROLS, CORRUPTION, AND COMPETITIVE RENT-SEEKING IN LDCs.

8419C   Grossman, Herschel I. POLICY, RATIONAL EXPECTATIONS, AND POSITIVE ECONOMIC ANALYSIS.

8420C   Garber, Peter M. and Robert G. King. DEEP STRUCTURAL EXCAVATION? A CRITIQUE OF EULER EQUATION METHODS.

8421C   Barro, Robert J. THE BEHAVIOR OF U.S. DEFICITS.

8422C   Persson, Torsten and Lars E.O. Svensson. INTERNATIONAL BORROWING AND TIME-CONSISTENT FISCAL POLICY.

8423C   Obstfeld Maurice. CAPITAL CONTROLS, THE DUAL EXCHANGE RATE, AND DEVALUATION.

8424C   Kuhn, Peter. UNION PRODUCTIVITY EFFECTS AND ECONOMIC EFFICIENCY.

8425C   Hamilton, Bob and John Whalley. TAX TREATMENT OF HOUSING IN A DYNAMIC SEQUENCED GENERAL EQUILIBRIUM MODEL.

8426C   Hamilton, Bob, Sharif Mohammad, and John Whalley. RENT SEEKING AND THE NORTH-SOUTH TERMS OF TRADE.

8427C   Adams, Charles and Jeremy Greenwood. DUAL EXCHANGE RATE SYSTEMS AND CAPITAL CONTROLS: AN INVESTIGATION.

8428   Loh, Choon Cheong and Michael R. Veall. A NOTE ON SOCIAL SECURITY AND PRIVATE SAVINGS IN SINGAPORE.

8429   Whalley, John. REGRESSION OR PROGRESSION: THE TAXING QUESTION OF INCIDENCE ANALYSIS.

8430   Kuhn, Peter. WAGES, EFFORT, AND INCENTIVE-COMPATIBILITY IN LIFE-CYCLE EMPLOYMENT CONTRACTS.

8431   Greenwood, Jeremy and Kent P. Kimbrough. AN INVESTIGATION IN THE THEORY OF FOREIGN EXCHANGE CONTROLS.

8432   Greenwood, Jeremy and Kent P. Kimbrough. CAPITAL CONTROLS AND THE INTERNATIONAL TRANSMISSION OF FISCAL POLICY.

8433   Nguyen, Trien Trien and John Whalley. EQUILIBRIUM UNDER PRICE CONTROLS WITH ENDOGENOUS TRANSACTIONS COSTS.

8434   Adams, Charles and Russell S. Boyer. EFFICIENCY AND A SIMPLE MODEL OF EXCHANGE RATE DETERMINATION.

8435   Kuhn, Peter. UNIONS, ENTREPRENEURSHIP, AND EFFICIENCY.

8436   Hercowitz, Zvi and Efraim Sadka. ON OPTIMAL CURRENCY SUBSTITUTION POLICY AND PUBLIC FINANCE.

8437   Lenjosek, Gordon and John Whalley. POLICY EVALUATION IN A SMALL OPEN PRICE TAKING ECONOMY: CANADIAN ENERGY POLICIES.

8438   Aschauer, David and Jeremy Greenwood. MACROECONOMIC EFFECTS OF FISCAL POLICY.

8439C   Hercowitz, Zvi. ON THE DETERMINATION OF THE EXTERNAL DEBT: THE CASE OF ISRAEL.

8440C   Stern, Robert M. GLOBAL DIMENSIONS AND DETERMINANTS OF INTERNATIONAL TRADE AND INVESTMENT IN SERVICES.

8441C   Deardorff, Alan V. COMPARATIVE ADVANTAGE AND INTERNATIONAL TRADE AND INVESTMENT IN SERVICES.

8442C   Daly, Donald J. TECHNOLOGY TRANSFER AND CANADA'S COMPETITIVE PERFORMANCE.

8443C   Grey, Rodney de C. NEGOTIATING ABOUT TRADE AND INVESTMENT IN SERVICES.

8444C   Grossman, Gene M. and Carl Shapiro. NORMATIVE ISSUES RAISED BY INTERNATIONAL TRADE IN TECHNOLOGY SERVICES.

8445C   Chant, John F. THE CANADIAN TREATMENT OF FOREIGN BANKS: A CASE STUDY IN THE WORKINGS OF THE NATIONAL TREATMENT APPROACH.

8446C   Aronson, Jonathan D. and Peter F. Cowhey. COMPUTER, DATA PROCESSING, AND COMMUNICATION SERVICES.

8447C   Feketekuty, Geza. NEGOTIATING STRATEGIES FOR LIBERALIZING TRADE AND INVESTMENT IN SERVICES.

8448C   Harrison, Glenn, W. and E.E. Rutstrom. THE EFFECT OF MANUFACTURING SECTOR PROTECTION ON ASEAN AND AUSTRALIA: A GENERAL EQUILIBRIUM ANALYSIS.

8501C

8502C   Horstmann, Ignatius and James R. Markusen. UP YOUR AVERAGE
         COST CURVE: INEFFICIENT ENTRY AND THE NEW PROTECTIONISM.

8503C   Gregory, Allan W. TESTING INTEREST RATE PARITY AND RATIONAL
         EXPECTATIONS FOR CANADA AND THE UNITED STATES.

8504C   Kuhn, Peter and Ian Wooton. INTERNATIONAL FACTOR MOVEMENTS
         IN THE PRESENCE OF A FIXED FACTOR.

8505C   Wong, Kar-yiu. GAINS FROM GOODS TRADE AND FACTOR MOBILITY.

8506C   Weller, Paul and Makoto Yano. FUTURES MARKETS, REAL INCOME,
         AND SPOT PRICE VARIABILITY: A GENERAL EQUILIBRIUM APPROACH.

8507C   Diewert, W.E. THE EFFECTS OF AN INNOVATION: A TRADE THEORY
         APPROACH.

8508C   Ethier, Wilfred J. FOREIGN DIRECT INVESTMENT AND THE
         MULTINATIONAL FIRM.

8509C   Dinopoulos, Elias. INSIDE THE BLACK BOX: (IN)TANGIBLE
         ASSETS, INTRA-INDUSTRY INVESTMENT AND TRADE.

8510C   Jones, Richard, John Whalley, and Randall Wigle. REGIONAL
         IMPACTS OF TARIFFS IN CANADA: PRELIMINARY RESULTS FROM A
         SMALL DIMENSIONAL NUMERICAL GENERAL EQUILIBRIUM MODEL.

8511C   Whalley, John. HIDDEN CHALLENGES IN RECENT APPLIED GENERAL
         EQUILIBRIUM EXERCISES.

8512C   Smith, Bruce. SOME COLONIAL EVIDENCE ON TWO THEORIES OF MONEY:
         MARYLAND AND THE CAROLINAS.

8513C   Grossman, S.J., A. Melino, and R.J. Shiller. ESTIMATING THE
         CONTINUOUS TIME CONSUMPTION BASED ASSET PRICING MODEL.

8514C   Romer, Paul R. TAX EFFECTS AND TRANSACTION COSTS FOR SHORT
         TERM MARKET DISCOUNT BONDS.

8515C   McCallum, Bennett T. ON CONSEQUENCES AND CRITICISMS OF
         MONETARY TARGETING.