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# 1 Introduction

Robert E. Baldwin

## 1.1 New Analytical Developments and the Need for Empirical Analyses

Increased interest in U.S. trade policy, stimulated by such factors as the massive U.S. trade deficit, a belief that intervention by foreign governments in international markets has given other countries a competitive edge over the United States, and concern about the increase in protection among industrial countries, has led to major analytical developments in international economics in recent years. The most important of these is the so-called new trade theory that emphasizes imperfect competition and increasing returns to scale in contrast to the traditional assumptions of perfect competition and constant returns. With this new framework it is possible to show that governments can sometimes “create” comparative advantages for their countries by exploiting market imperfections and scale economies. Furthermore, by introducing appropriate trade taxes or subsidies, governments can sometimes raise domestic welfare by shifting excess oligopolistic profits from foreign to domestic firms.

Another major development is the broadening of the scope of international economics to include the study of the political and economic factors shaping trade policy decisions by governments. By modeling the public choice process, economists are able to better understand not only why it is often very difficult politically to introduce trade measures that they believe will raise national welfare but why policies that they think will reduce national welfare are sometimes implemented.

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As is the case with the traditional competitive framework, a wide range of economic outcomes is possible in both imperfectly competitive and public choice models. Which outcomes are most likely under various conditions can only be determined by careful empirical, institutional, and historical analyses of relevant cases and events. Unfortunately, such studies do not exist in sufficient numbers to draw many general conclusions, due to the long-standing lack of interest by economists in trade policy matters and the newness of the imperfectly competitive and public choice approaches. The purpose of this volume is to help correct this state of affairs by analyzing various trade policy issues not only theoretically but in empirical, institutional, and historical terms. It contains the papers presented at a National Bureau of Economic Research conference on Trade Policy Issues and Empirical Analysis, which took place in Cambridge, Massachusetts, on February 13–14, 1987. Most of the comments of the discussants of the papers are also included. The conference was one of a series being held as part of NBER's trade relations project, which is financed by the Ford Foundation.

The volume is divided into four parts. The four chapters in part I, "Measuring Trade Policy Effects under Imperfectly Competitive Market Conditions," empirically assess the economic impact of various trade policies introduced in industries where the "new" trade theory seems to apply. Part II, "Measuring the Economic Effects of Protection," contains two chapters that attempt to isolate the effects of protection from the influences of the many other economic changes that accompany actual periods of protection and one chapter that examines how the effects of exogenous changes in economic conditions vary depending on the form of protection. The chapter in part III, "Determining the Relationship between Foreign Direct Investment and Exports," provides new empirical evidence on the issue of the effect of foreign production by a country's firms on the home country's exports. In part IV, "Assessing U.S. Bilateral Trade Policy Disputes," two key bilateral issues are analyzed, namely, recent U.S.-Japanese trade tensions and the incident involving the threat of the imposition of countervailing duties by the United States on Canadian softwood lumber. The latter chapter adopts an explicit political economy framework.

## **1.2 Measuring Trade Policy Effects under Imperfect Competition**

The first chapter in part I, "Empirics of Taxes on Differentiated Products: The Case of Tariffs in the U.S. Automobile Industry," by James Levinsohn, focuses on the trade and domestic production effects of imposing a tariff on a subset of a group of differentiated products, in particular, automobiles imported from only one country or only small

cars rather than all cars. To deal with the problem of estimating own- and cross-price elasticities of demand for over a hundred different models of available cars, most of which are available for only a few years, Levinsohn adopts a Lancasterian characteristic approach to determine which multidimensionally differentiated automobiles closely compete with each other, that is, which are neighbors. This technique makes the estimation problem tractable, since the cross-price effects of non-neighbors are assumed to be zero.

The resulting list of neighbors for the various models is quite reasonable and the derived demand elasticities are both reasonable and statistically significant. Levinsohn's calculations indicate, for example, that a 1 percent increase in the price of imported Japanese automobiles leads to a .187 percent rise in the demand for domestically produced autos and a .393 percent and .300 percent rise in the demand for imported German and Swedish cars, respectively. In contrast, he estimates that a 1 percent rise in the price of all imported cars would stimulate a .367 percent increase in U.S. auto production.

Richard Baldwin and Paul Krugman empirically model international competition in the market for large commercial jet aircraft in chapter 3, "Industrial Policy and International Competition in Wide-Bodied Jet Aircraft." The aircraft industry is technology-intensive, involving large initial development expenses as periodic fundamental breakthroughs in design are made. There are significant reductions in production costs as experience with new technology is gained. A special feature of the medium-range, wide-bodied aircraft sector on which the authors focus is that one of the two suppliers, Airbus, is a consortium jointly owned and heavily subsidized by four European governments. The authors' main aims, using the simulation model they develop, are to reproduce the competitive conflict between Airbus and the U.S. supplier of such aircraft, Boeing, and to estimate the magnitude of the actual subsidy received by Airbus and its effect on welfare in the United States, Europe, and the rest of the world.

The authors model international competition between Boeing and Airbus as a Cournot duopoly situation in which the willingness of European governments to subsidize Airbus enables this firm to use a zero discount rate in calculating its optimum output path, in contrast to a 5 percent rate for Boeing. Relying on various industry studies for estimates of initial setup costs, the elasticity of the learning curve, the price elasticity of demand for the aircraft, and other needed parameters, Baldwin and Krugman first calibrate the model to a base period in which the price of the aircraft and the market shares of the two producers are known and then simulate the behavior of prices and market shares thereafter. They also simulate a scenario in which the European countries do not subsidize production and Boeing is the only producer

throughout the period. Their basic result is that the subsidized entry of Airbus cost Europe about \$1.5 billion and reduced Boeing's potential profits significantly. The early market entry of the aircraft due to the existence of Airbus also brought significant consumer benefits to all, although not enough to offset the loss in producer surplus in the United States.

In chapter 4, "Strategic Models, Market Structure, and State Trading: An Application to Agriculture," Marie Thursby considers the optimum role for government trade policy in a situation in which two countries, one represented by a marketing board that maximizes joint producer returns and the other by one or more private firms that maximize profits, compete in exporting a homogeneous agricultural product to a third country. Both countries consume the product themselves but do not export to each other's domestic market. This framework fits the stylized role of Canada and the United States in the world wheat market.

Thursby finds that optimal trade policy differs depending on whether the marketing agent maximizes producer returns or profits only if the government with the marketing board regulates the domestic price of the commodity. In particular, an export tax might be the optimal policy for the government of the country with a regulated marketing board, whereas an export subsidy is always the optimal policy for a government when the country's exports are controlled by a private, profit-maximizing monopolist. If the private export industry is composed of more than one firm, however, an export tax also might be optimal for this government.

Using the ability to price-discriminate between export and domestic markets as an indicator of market power, Thursby empirically analyzes the relationship between differences in U.S. export and domestic prices of grains and volumes of U.S. exports of these commodities (a positive relationship indicates the existence of market power); she concludes that, except in the case of wheat, there is no evidence of the exercise of monopoly power by U.S. exporters. This suggests that the appropriate strategic grains policy for the U.S. government would be export taxes.

Surprisingly little work has been done in applying the "new" trade theory to developing countries. Yet, as Dani Rodrik points out in chapter 5, "Imperfect Competition, Scale Economies, and Trade Policy in Developing Countries," available evidence on concentration ratios and scale economies suggests that the imperfect competition framework is even more germane for developing countries than developed economies.

Rodrik first develops a general equilibrium framework for assessing the benefits and losses from partial trade liberalization by developing countries in which he shows the potential clash between pulling re-

sources out of protected sectors and expanding firm output in industries with significant scale economies. He then simulates the effect of liberalizing imports in three typical developing-country industries, automobiles, tires, and electrical appliances, in order to assess the relative importance of these two conflicting forces. His conclusion is that the levels of protection observed in the manufacturing sectors of most developing countries greatly exceed any that can be justified by the presence of imperfect competition. He stresses, however, that the optimal pattern of liberalization under imperfectly competitive conditions is likely to be quite different from what one might anticipate on the basis of intuition deriving from the competitive paradigm.

### **1.3 Measuring the Economic Effects of Protection**

In measuring differences in the degree of openness among countries, economists are hampered by the difficulty of quantifying the many nontariff trade barriers presently restricting international trade. Edward Leamer in chapter 6, "Measures of Openness," which is the first essay in part II, tries to overcome this problem by using data on supplies of productive resources and distances to markets to explain the observed degree of a country's openness and then by taking the difference between the degree of openness predicted by the model and the actual degree of openness as a measure of the effects of a country's trade barriers.

Utilizing 1982 trade data for 183 three-digit Standard International Trade Classification (SITC) commodities covering sixty-five countries, he estimates both a factor-analytic model with resources treated as unobserved variables and a model with measured values for the resources. The factor-analytic model fits the observed data quite well, and an examination by country of the commodities contributing the most to the absolute residuals suggests that they can be explained by reasons other than trade barriers. Rather than concluding that trade barriers are not an important impediment to openness, Leamer concludes that the technique itself is seriously flawed because only peculiarities in a country's trade in comparison with the trade of others can give rise to the result that barriers are important. For example, if all countries protect to the same degree, the technique will not pick up any of the restrictive effects of these barriers.

The model based on measured values for resources is not open to the same criticism, but its relatively poor fit suggests that there are important omitted variables. An examination of the individual items contributing the most to the residuals reinforces the view that omitted variables are the major explanation why most items appear on the list. Leamer, consequently, is pessimistic about the ability of residual

techniques to capture the effects of trade barriers on the degree of openness among countries.

Chapter 7, by Robert Baldwin and Richard Green, "The Effects of Protection on Domestic Output," attempts to measure the degree to which import protection stimulates domestic output and employment levels in the protected industries. After reviewing various theoretical reasons why protection may be less effective than policymakers might expect, the authors review reports of the International Trade Commission (ITC) evaluating industry requests for the extension of import protection and then undertake an econometric analysis of the effectiveness of protection.

The ITC documents several instances where protection has been undermined because of various unanticipated responses by suppliers and consumers. Country-specific protection granted the color television and nonrubber footwear industries, for example, was rendered ineffective by an increase in imports from noncontrolled suppliers. Quality upgrading, modifications in the product in order to qualify for a different tariff classification, and shifts by consumers to substitute products have also caused protection to be ineffective in various cases.

Using data for five industries at the four-digit SITC level over the period 1972–82, the econometric analysis utilizes a vector autoregression model to test the hypothesis that a change in the level of protection does not "Granger cause" a change in the level of domestic output. In only one industry, footwear, are the results inconsistent with this hypothesis.

Rather than assessing the effects of different forms of protection introduced because of an increase in imports, Val Lambson, in chapter 8, "Trade Restraints, Intermediate Goods, and World Market Conditions," explores the effects of changes in economic conditions once protective policies are in place. In particular, using a general equilibrium model with intermediate goods, he contrasts the effects of a change in a country's terms of trade on domestic prices, factor use, and consumption when protection is provided, alternatively, by tariffs, by quotas, and by domestic content requirements in either physical or value terms.

Lambson finds that world and domestic prices of inputs move together when a tariff is in place, whereas under a quota a change in the world input price has no effect on its domestic price. With a domestic content requirement expressed in physical terms, the two prices are negatively correlated. The sign of the relationship when the domestic content requirement is stated in value terms is ambiguous. Lambson illustrates the possible magnitude of these various effects with a simple simulation exercise.

#### **1.4 Measuring the Effects of Foreign Direct Investment on Exports**

As Magnus Blomström, Robert Lipsey, and Ksenia Kulchycky note in chapter 9, “U.S. and Swedish Direct Investment and Exports,” which makes up part III of the volume, the effect of the foreign production associated with foreign direct investment on the investing country’s exports is still not fully settled, despite a considerable amount of previous empirical research. Policy proposals to hinder foreign investment out of concern that domestic jobs are lost by the substitution of foreign production for domestic production are still frequently put forth. A difficulty with all empirical studies of this issue is the likelihood that the variables determining investment and affiliate production in a country are the same ones determining trade flows. The authors attempt to overcome this simultaneity problem by using changes in exports rather than export levels, since it seems likely that the most troublesome unaccounted-for factors simultaneously influencing investment and exports do not determine changes in exports.

Blomström, Lipsey, and Kulchycky find that the higher the level of Swedish affiliate production in a country, the higher the level of Swedish exports to that country and that industry. Their results based on U.S. data are more mixed, however. At the most disaggregated industry level there is a preponderance of positive relationships between affiliate net sales and U.S. exports, but there are a few negative relationships, implying some substitution between affiliate production and U.S. exports.

#### **1.5 Assessing U.S. Bilateral Trade Policy Disputes**

In “United States–Japan Economic Relations,” chapter 10 in part IV, Rachel McCulloch reexamines the main sources of economic friction between the United States and Japan and evaluates their significance in affecting current and future relations between the two countries. She concludes that the major source of friction, the huge Japanese export surplus with the United States, has been caused by a mismatch of macroeconomic policies and conditions in the two countries, in particular, U.S. fiscal policies that have produced the large federal budget deficit, the increased attractiveness of U.S. investments to foreigners coupled with the reduced appeal of foreign investments to Americans, and the liberalization of Japanese restrictions on capital outflows.

As McCulloch points out, the econometric evidence on whether Japan’s low import share, especially in manufacturing, is due to trade barriers is conflicting. Some investigators of this issue find that Japan’s



trade is adequately explained by the same basic determinants that explain the trade of other countries; others find the opposite result, which they attribute to hidden import barriers. Even the latter group agrees, however, that removing the barriers is unlikely to have a major effect in reducing the overall trade imbalance.

McCulloch notes that the catch-up phase in Japan's technological knowledge has been completed and that, as the United States and Japan continue to become more similar in terms of technology base, capital, and labor skills, intra-industry trade is likely to grow significantly. She argues that sectoral trade conflicts will continue, however, as the two countries pursue different approaches to phasing out declining industries and nurturing new ones.

The final, very interesting chapter in the volume is by Joseph Kalt. As the title, "The Political Economy of Protectionism: Tariffs and Retaliation in the Timber Industry," indicates, Kalt uses a public choice perspective to analyze a major trade dispute between Canada and the United States. The incident involved preliminary findings, by the U.S. Commerce Department and the International Trade Commission, that Canada was subsidizing exports of softwood timber and that this was causing material injury to U.S. softwood lumber producers. It was highly likely that these findings would be confirmed in the final decisions of these organizations and that a 15 percent countervailing duty against Canadian softwood lumber exports would be imposed. But after high-level political efforts to contain the dispute, Canada agreed to impose a 15 percent duty on softwood lumber exports to the United States in return for the U.S. lumber industry's dropping the case.

Kalt finds that the actions of the U.S. lumber industry fit the "capture" theory of policy-making very well. The industry was able to organize effectively, produce well-reasoned technical and legal documents for the relevant government agencies, and enlist congressional support for its appeals to the White House. The Canadian lumber industry and the Canadian government objected vigorously to the pending imposition of countervailing duties but eventually accepted the export tax compromise, a solution that, by Kalt's calculations, actually increases Canada's national welfare on balance. He finds the paths that protectionism took in this case to be sobering. The United States was not pursuing a strategic policy to improve welfare but was pushed into protection by powerful domestic political interests and then had to find a way to halt the threat of a trade war by appeasing the affected foreign country.