Rethinking International Trade

Paul R. Krugman

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Preface

This book collects papers written over a ten-year period. It is by no means a complete collected works: like many of my colleagues in this age of word processors and international conferences, I write too much, not all of it different. What this volume tries to do, instead, is offer a limited selection of papers that represent my main contribution to what for want of a better term I call the "new trade theory."

New trade theory is an approach to international trade that emphasizes precisely the features of the international economy that traditional trade theory leaves out: increasing returns and imperfect competition. The new approach emerged quite quickly in the late 1970s and represents a fundamental change in the way we think about international trade. Although I have worked in a number of other areas in international economics, from exchange rate determination to international debt, it is the research on new approaches to international trade that I regard as the main justification for my professional existence.

No one does research in a vacuum. I first began to think about imperfect competition and trade as a result of a short course given by Robert Solow; I was encouraged to take the risk of moving into this research area by my one-time teacher and now colleague Rudiger Dornbusch. In the early period when I found little acceptance for my ideas, crucial moral support came from Carlos Díaz-Alejandro. This is not to say that there was anything like a struggle between a stubborn old guard and the new idea: in fact, critical professional support was provided by the grand master of traditional theory, Jagdish Bhagwati (another of my former teachers). My longtime collaborator Elhanan Helpman, in addition to being a great innovative international economic theorist himself, has provided me with an example of professional integrity and intellectual discipline that I have badly needed.

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Most of the work collected here was done under the auspices of two great Cambridge institutions. MIT's Department of Economics has some of the best faculty and unquestionably the best students in the world. The National Bureau of Economic Research has provided financial support and, more important, a kind of invisible college that has been invaluable in many ways.

The greatest thanks go, of course, to my family—to my parents and to my wife, Robin Bergman, who makes it all worthwhile.

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Introduction

The past ten years have seen a remarkable change, a sort of quiet revolution, in the theory of international trade. As late as 1980 the study of international trade was widely regarded in the economics profession as a deeply conservative area marked by a reverence for intellectual tradition rare in the generally brash environment of North American economics. Beginning in the late 1970s, however, an initially small group of theorists began to develop a new approach to international trade, reopening the most basic questions in the field: Why is there international trade? What determines the international pattern of specialization? What are the effects of protectionism? What is the optimal trade policy? In each case the new theory has challenged the traditional wisdom.

The papers collected in this volume represent part of my own contribution to the new theory of international trade. This is not my first book-length venture in the area. Together with Elhanan Helpman of Tel-Aviv University I have written a pair of monographs on international trade: *Market Structure and Foreign Trade* (1985) and *Trade Policy and Market Structure* (1989). I have also edited a volume of informal essays in the field: *Strategic Trade Policy and the New International Economics* (1986). This collection supplements the other books, providing a more personal if less methodical tour of the new concepts that have emerged so rapidly over the past decade.

What Is the New Trade Theory?

If one had to provide a concrete example of what the new trade theory is about, it might be this: conventional trade theory views world trade as taking place entirely in goods like wheat; new trade theory sees it as being largely in goods like aircraft. Since a good part of world trade *is* in goods like wheat, and since even trade in aircraft is subject to some of the same influences that bear on trade in wheat, traditional theory has by no means

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been disposed of completely. Yet the new theory introduces a whole set of new possibilities and concerns.

Begin with the most basic question: Why is there international trade? The traditional theory answers, Because countries are different. Canada exports wheat to Japan because Canada has so much more arable land per capita, and as a result in the absence of trade wheat would be much cheaper in Canada. The differences between countries that drive trade may lie in resources, technology, or even in tastes, but in any case, traditional theory takes it as axiomatic that countries trade in order to take advantage of their differences.

The new theory acknowledges that differences between countries are one reason for trade, but it adds another: Countries may trade because there are inherent advantages to specialization. The economies of scale in aircraft manufacture are so large that the world market can accommodate at best only a few efficient-scale producers and thus only a few centers of production. Even if Japan and the United States were identical, it is likely that only one country would be producing (say) wide-bodied jet aircraft, and as a result there must be trade in order to allow the centers of production to serve the world market. Of course, the United States and Japan are not identical, but the new theory says that much trade, especially between similar countries, represents specialization to take advantage of increasing returns rather than to capitalize on inherent differences between the countries.

What determines the international pattern of specialization? In traditional theory the answer emerges from the explanation of trade itself: Countries produce goods that would have been relatively cheap in the absence of trade. Comparative advantage may arise from a variety of sources, but in any case the attributes of a country determine what it produces.

In the new theory an important element of arbitrariness is added to this story. Why are aircraft manufactured in Seattle? It is hard to argue that there is some unique attribute of the city's location that fully explains this. The point is, instead, that the logic of increasing returns mandates that aircraft production be concentrated *somewhere,* and Seattle just happens to be where the roulette wheel came to a stop. In many of the new models of trade, the actual location of production is to some degree indeterminate. Yet what the example of Seattle suggests, and what is explicit in some of the models, is a crucial role for history: Because Seattle (or Detroit or Silicon Valley) was where an industry initially got established, increasing returns keep the industry there.

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What are the effects of protection? In traditional trade models a tariff or import quota raises the price of a good for both domestic producers and domestic consumers, reduces imports, and generally, except in some well-understood cases, is a bad thing. In new trade theory the result could be either much worse or much better. Let all countries protect domestic aircraft industries, and the result will be a fragmented world market in which losses arise not only from failure to specialize in accord with comparative advantage but also from inefficient scale production. On the other hand, an individual country that protects its aircraft industry might conceivably increase the scale of that industry sufficiently to reap a net benefit, possibly even lower prices to domestic consumers.

Finally, what is the optimal trade policy? Traditional theory is the usual basis for advocating free trade, one of the most strongly held positions in the economics profession (although actually even in traditional theory a second-best case can be made for protection as a corrective for domestic market failures). The new trade theory suggests a more complex view. The potential gains from trade are even larger in a world of increasing returns, and thus, in a way, the case for free trade is all the stronger. On the other hand, the aircraft example clearly suggests that an individual country acting alone may have reasons not to adopt free trade. New trade models show that it is *possible* (not certain) that such tools as export subsidies, temporary tariffs, and so on, may shift world specialization in a way favorable to the protecting nation.

The Problem of Market Structure

The brief description of the differences between old and new trade theory given above sounds very simple, and one may wonder why it look so long for the new theory to emerge. The main answer is that while trade based on increasing returns is easy to talk about in a general sense, it is difficult to model formally. Since economics as practiced in the English-speaking world is strongly oriented toward mathematical models, any economic argument that has not been expressed in that form tends to remain invisible. While many economists no doubt understood that increasing returns could explain international trade even in the absence of comparative advantage, before 1980 there were no clean and simple models making the point. As a result this idea was often simply left out of textbooks and trade courses, and even good trade theorists often seemed unaware of the possibility. It is always difficult to recapture the state of mind of a profession before a major change in thinking, but I can report from experience with early presentations

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of some of the papers here that in the late 1970s the role of scale economies in trade was neither well understood nor readily accepted.

The principal obstacle to formal modeling of increasing returns in trade before the late 1970s was the problem of market structure. In general, increasing returns are inconsistent with perfect competition, and economists in general and trade theorists in particular have usually relied on the assumption of perfect competition to make their models tractable. Perfect competition requires, in particular, that price equal marginal cost, yet in an environment of increasing returns, marginal cost pricing would lead to universal losses. The only exception is where the increasing returns are wholly external to firms, that is, where costs fall with the size of the industry but not with the size of the firms that comprise it. External economies are, however, theoretically awkward and empirically elusive. Although a small literature on trade in the presence of external scale economies existed before the great change in the field, it was a literature with little influence.

What made the difference was the revolution in industrial organization theory during the 1970s. Once upon a time the field of industrial organization was largely atheoretical—a matter of case studies and summary regressions. During the 1970s, however, economists began to offer a variety of explicit models of behavior in imperfectly competitive markets, in what eventually became an explosion of theory. At a certain point the idea of applying these models to international trade was bound to occur to somebody, and by the late 1970s several people were independently working on models of trade that drew for the first time on industrial organization concepts.

Surprisingly, it proved possible to develop models of trade in the presence of increasing returns and imperfect competition that were not only illuminating but also simple and elegant. The long dominance of Ricardo over Smith—of comparative advantage over increasing returns—was largely due to the belief that the alternative was necessarily a mess. In effect, the theory of international trade followed the perceived line of least mathematical resistance. Once it was clear that papers on noncomparative-advantage trade could be just as tight and clean as papers in the traditional mold, the field was ripe for rapid transformation.

Somewhat surprisingly, a side product of the emergence of models that combine industrial organization and trade theory has been a mild resurgence of interest in external economies. This is partly because some models with increasing returns give rise to effects that closely resemble external economies, for example, when there are increasing returns in the production of

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intermediate goods. More important, perhaps, is that once the role of increasing returns was legitimized as a concern of trade theory, all forms of increasing returns were given greater respect. It is also true that some of the modeling tricks used to make industrial organization models tractable turn out to work on external economies too.

Themes of the New Trade Theory

The papers collected in this book are organized into four parts reflecting four themes that have emerged in the new literature on international trade.

The Causes of International Trade

The original purpose of the new trade theory was to offer an alternative answer to the most basic question of international economics: the reason for international trade. Chapter 1 presents the view in its starkest form: this is a model in which trade arises entirely because of increasing returns, in a world of initially identical countries. In chapter 2 this view is elaborated upon in a model that can accommodate transport costs and differences in demand patterns among countries. The main additional insight from this chapter is the "home market effect," the tendency of countries to export goods for which they have a relatively large domestic market. This insight turned out to play a significant role in the analysis of trade policy.

Not too surprisingly, few of my colleagues were eager to drop well-studied models of comparative advantage in favor of an approach that could not make any allowance for comparative advantage at all, nor were they eager to adopt the new approach unless it could be demonstrated that it made a difference. Chapter 3 represents an effort to overcome both sources of resistance. It offers a model in which both comparative advantage and increasing returns give rise to trade and in which the relative importance of the two motives can be measured by a pair of parameters. It shows how the pattern and volume of trade is altered by the presence of scale economies. More important in terms of selling the new theory, I was able to show how the effects of trade on the distribution of income depended crucially on the motives for trade.

One might have thought that once comparative advantage and economies of scale were included, one had a complete accounting of the possible reasons for international trade. However, in a surprising paper James Brander (1981) pointed out that oligopolistic firms might well sell into each others' markets even in the absence of both comparative advantage and increasing

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returns. Brander's original model depended on the assumption of zero transport costs and thus was dismissed by some economists as a trivial case. What he and I attempted to do in chapter 4 was show that the case was by no means trivial but rather a true alternative to both comparative advantage and increasing returns for explaining trade.

Chapter 5 is a survey that ties together themes not only from my own work but from the work of the other economists who developed the new trade theory. It also presents in a brief form some of the key lines of thought from my first monograph with Elhanan Helpman (Helpman and Krugman 1985), a work that tried, among other things, to go beyond the special assumptions of the monopolistic competition models and find the deeper underlying structure.

The Role of History

Part II of the collection contains three papers in a line of work that is still relatively undeveloped. As suggested earlier in this introduction, in the presence of increasing returns—perhaps especially when these increasing returns take the form of external economies—history matters. A pattern of specialization can be established as a result of accident or some initial difference in countries' resources, then get locked in by the cumulative advantages that go with large scale.

Chapter 6 applies this idea to the perennial question of why some countries are richer than others. It was written at a time when the agitation for a New International Economic Order was still at its height, and the purpose of the paper was to show what kind of model was necessary to make sense of the then widely popular doctrine of uneven development. Fashions in politics come and go, but the model is still, I believe, useful as a sharp-edged presentation of the idea that a small initial disparity in industrialization can lead to growing inequality over time.

Chapter 7 shows how learning by doing can lock in a pattern of international specialization and how temporary shocks, including temporary protection, can have permanent effects on who produces what. This chapter is also almost unique in the volume, and indeed in the whole literature, in linking long-run specialization and trade to short-run monetary and exchange rate developments.

Chapter 8 links monetary economics to the new trade theory in a different way. It points out that the special role of a few currencies as international media of exchange is unquestionably the result of increasing returns, and it follows this line of argument to show that the international

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monetary system has the characteristic features that the new trade theory tells us to expect: arbitrary specialization (in this case selection of one currency as vehicle), multiple possible equilibria, and a key role for history.

Technology and Trade

There is a natural alliance between the new trade theory, with its emphasis on increasing returns and imperfect competition, and the view that technological change is a key factor driving international specialization. The two views are not necessarily linked: conventional trade theory can say many useful things about the *effects* of technological change (though little about its causes), and many of the new models focus on garden-variety static scale economies. Nonetheless, technological development is normally an increasing returns process carried out in imperfectly competitive industries, and the most important sources of increasing returns in practice probably lie in dynamic economies of learning and R&D.

Chapters 9 and 10 are actually conventional trade models that borrow techniques and images from the new trade theory to examine the effects of technology on trade. The first is a product cycle model that examines the effects of continuous product innovation; the second a model that is similar in spirit but focuses on process innovation instead. In each case the key question is whether a country needs to keep running in order to stay in the same place. That is, in a dynamic world does a country that fails to innovate suffer an absolute as well as a relative decline in its standard of living? The answer in both cases is a qualified yes.

Chapter 11 ties the analysis of technology and trade to the new trade theory; it shows how the increasing returns inherent in innovation lead to imperfect competition and, conversely, how temporary monopoly is a necessary incentive for technological change.

Trade Policy

To many people the bottom line of any economic theory must be its implications for policy. I am not sure this is the case: in the long run contributing to understanding may be more important than offering an immediate guide for action. Still, a good deal of the excitement around the new trade theory has been generated by the possibility that it may offer new arguments against free trade.

Chapters 12 and 13 focus on one issue that has assumed a great deal of practical prominence in U.S. trade disputes with Japan: the idea that a

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protected domestic market is actually an export promotion device and that such export promotion can be a successful beggar-thy-neighbor strategy. Chapter 12 sets out the theory; chapter 13, coauthored with Richard Baldwin, is an application to the case of international competition in semiconductors.

Finally, chapter 14 is an attempt to take stock of the role of imperfect competition in trade theory. While it was originally intended as a general survey for industrial organization theorists, it focuses largely on the policy issues.

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