

A CRITICAL REVIEW OF THE NORMATIVE THEORY OF INTERNATIONAL TRADE*

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Recent events around the world suggest that the issue of the gains from international trade is as relevant and alive today as it was during the Mercantilist era many centuries ago. Normative trade theorists have long been striving to answer two basic questions. First, in what sense can trade be regarded as gainful (or harmful) to a country? Second, what are the circumstances under which trade is gainful (or harmful) to a trading country? The principal aim of this paper is to provide a succinct and updated review of the progress of normative trade theorists in finding answers to the above two questions. The paper suggests that it was Montesquieu, rather than Adam Smith, who raised the first question in a meaningful way. The first question is then shown to be satisfactorily answered by Pareto. However, the answer to the second question is still incomplete despite tremendous progress the past 45 years, especially in the case of finite, competitive and barter economies. The answer is incomplete in the sense that, outside the perfectly competitive framework, there is no general proposition that describes the conditions which are compatible with trade gains and conditions which are compatible with trade losses.

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JEL Classification: F11, F12, F13

1. Introduction

International trade and investment is the backbone of our modern world. Exports, imports, foreign direct investment (FDI), the internationalization of technology and the economic activity of multinational enterprises currently dominate the world's commercial affairs. For example, the share of international trade (sum of exports and imports) in GDP has been growing steadily throughout the Organisation for Economic Co-operation and Development (OECD) from the early 1990s to the global economic slowdown in 2008. More specifically, the unweighted average trade-to-GDP ratio for the OECD as a whole more than doubled

*Valuable comments from Professor Murray Kemp are greatly appreciated. The usual caveat applies.

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from 25.2 per cent in 1992 (OECD, 2010) to 57.5 per cent in 2008 (OECD, 2011: 87). For many small, developing countries, the extent of trade is even much more substantial. For example, according to the World Bank (2013), Vietnam's trade-to-GDP ratio decreased from 157.4 per cent in 2008 to 130.7 per cent in 2009 but then rebounded to 147.6 per cent and 164.8 per cent in 2010 and 2011, respectively.

The seemingly growing dependence of the world's continuing prosperity on international economic integration has been accompanied by the anti-globalization movement, which has recently resulted in highly publicized protests around the globe; see, for example, the 2010 Toronto G-20 summit protests (Wikipedia, 2013). There are presumably a variety of different motives behind such a movement. These include, for example, concerns for poverty, poor working condition of workers in low-income countries, job losses in industrialized countries, influence of transnational companies and environmental destruction. However, implicit in the anti-globalization movement is the public concern for the distribution of the gains from international trade and investment. This suggests that the critically important issue of the gains from trade is as relevant and alive today as it was in the Mercantilist era many centuries ago.

This paper is motivated by the above discussion and the apparent lack of a coherent and updated review of the main findings of the normative theory of international trade. There have been some excellent surveys of the field but they are now dated; see, for example, Corden (1984) and Kemp and Wan (1993). Of course, there are now available two volumes of major, original papers on the gains from trade by Kemp and coauthors (1995, 2001). While these two collected volumes serve as essential references for normative trade theorists, they do not readily present a systematic and updated overview of the discipline. Tran-Nam (2008) and Kemp (2010a) offered more recent summary reviews of the normative trade theory but their papers are incomplete in many respects.

In view of the above, the principal aim of this paper is to provide a succinct, critical review of the theory of the gains from trade. The review covers both the historical foundation as well as some of the recent developments in the field. The scope of the paper excludes related topics such as FDI and international aid (although FDI can be interpreted as a form of intertemporal trade). Without loss of generality, the paper emphasizes the pure normative theory of international trade bearing in mind that many theoretical results concerning the gains from trade in a barter world carry over to a monetary world (see, for example, Kemp, 1990; Kemp and Wong, 1995). Similarly, international migration is ignored in view of the fact that gains from international migration can be accommodated within the general normative theory of trade (see, for example, Kemp, 1993).

Since the current literature on normative trade theory is immense, it is not feasible to review the numerous papers in any detail within the constraint of a single paper. In providing a succinct and updated overview of the theory of the gains from trade, this paper employs a 'structural' rather than historical approach. The structural approach focuses on key aspects of the normative theory of trade rather than the historical evolution of the discipline. The review is thus selective (i.e., concentrating on pioneering papers or papers with relaxed assumptions and general results) rather than comprehensive.

The scope of the paper also excludes the substantial literature on trade policy and on the empirical evidence of the gains from international trade and integration. For those readers who are interested in empirical studies, there are two strands of literature that deserve further attention. The first includes quantitative attempts to estimate the gains from trade and the distribution of those gains using computable general equilibrium models (see, for example, Whalley, 1982; 1984). The second, building on recent contributions of Eaton and Kortum (2002), Anderson and van Wincoop (2003), and Melitz (2003), examines the effects of globalization, using specific modelling frameworks that allow the quantification of the welfare effects of trade using counterfactual analysis.¹

The remainder of this paper is organized as follows. Section 2 examines the historical development of the normative theory of international trade. It is argued that the foundation of the normative theory of trade involves a misattribution. In particular, it is suggested that it was Montesquieu, rather than Adam Smith, who first raised the issue in a manner which is compatible with the modern approach. Section 3 then analyzes the general structure of any normative theory of trade. In this section, the pre-trade equilibrium, the specification of the world economy, the compensation scheme and the post-trade equilibrium will be discussed in turn. Section 4 summarizes the core propositions in the normative theory of trade. A distinction is drawn between general propositions proven within the perfect competition paradigm and less general propositions outside the perfect competition paradigm. Pareto harmful trade and difficult problems are considered in Section 5 of the paper. Some concluding remarks are then given in the final section.

2 Historical Development of the Normative Theory of International Trade

2.1 The Foundation

The normative theory of international trade has a long history with a somewhat obscure beginning. In fact one may plausibly argue that the history of normative trade theory is longer than that of economic theory itself. Many, if not most, English-speaking economists typically associate the gains from trade with Adam Smith, universally acknowledged father of economics as a modern science. It is well known that the benefits of free trade were expounded by Smith (1776, Book Four, especially Chapter III, Part 2) in his rebuttal of the English Mercantilists. In modern terminology, Smith's argument suggested that moving away from autarky or prohibitive import tariffs toward free trade would, in the presence of market competition, result in positive gains.

This is a most admirable argument although, as Samuelson (1938: 261–62) pointed out, the type of trade that Smith referred to is “trade between countries with perfect social solidarity and consensus (e.g., totalitarian states); or between units each consisting of identical (representative) individuals; or better still, merely trade between individuals which illuminates the process of international trade. In this way the problem of weighing and combining different individuals' advantages within each country is avoided.” Samuelson

¹ For a review of this strand of literature refer to Costinot and Rodríguez-Clare (2013).

went on to note that this unsatisfactory way of characterizing international trade was indeed a common feature among classical trade theories.

From a modern theory point of view, Kemp (2001: 1) reminded us that it was the French social philosopher Montesquieu who had posed the right sort of questions well before the first appearance of the *Wealth of Nations*. In his little known letter to Mr Domville,² Montesquieu (1759) offered an enlightening view of social welfare. The defining novelty in his approach is that he considered the benefits of commerce and industry from the perspective of individual citizens, rather from that of the Prince (Desserud, 1999: 148). Unfortunately, his letter was not published until the 1950s³ and its English translation only became available toward the end of the last century (Desserud, 1999).

Montesquieu's idea can be interpreted in the context of international trade as follows. In which sense can a country be said to benefit or to suffer from its trade with other countries? This is by no means a trivial question if one agrees to view the gains from trade from the perspective of individual citizens. It is well known that, in general, the opening of trade makes some people worse off than under autarky. So the gains from trade are not immediately evident unless we engage in interpersonal comparison of the utilities of the gainers and losers. The weakness of this subjective approach is that there may be no universal agreement whether a country has benefited or suffered from trade. An alternative, equally unsatisfactory, approach is to assume that all economic agents are identical, as alluded to by Samuelson above. In this sense, early trade models, such as Ricardo's comparative advantage theory, offered no insight to the question of gains from trade because they all implicitly employed the representative agent assumption.

Surprisingly, it took almost one and a half centuries before the emergence of a conceptual tool that can satisfactorily deal with Montesquieu's question. Thanks to Pareto's now well-known concepts of welfare improvement⁴ and the compensation principle (Pareto, 1894)⁵ normative trade theorists could finally respond to Montesquieu's question in a convincing fashion. In fact, Pareto (1895/2008: 415–416; 419–420) did apply his compensation principle in the process of demonstrating the gainfulness of trade for a competitive economy. Sadly, Pareto published his important results in Italian so that his persuasive insight was overlooked and disregarded by generations of English-speaking economists.

Pareto's approach was exploited in a path breaking paper by Samuelson (1939). In this brilliant paper, Samuelson considered a single, price taking country which produces any number of commodities using any number of factors. Under a number of standard assumptions, he proved that free trade is potentially gainful to such an open economy

² William Domville supervised the translation of Montesquieu's work into English. On 24 May 1749 he wrote to Montesquieu seeking the latter's view about the future of England (see Desserud, 1999: 135).

³ This letter was included in Montesquieu's complete work for the first time in the 1950 edition of the book. Today it is still not well-known, even among the community of scholars.

⁴ A Pareto improvement refers to a change from one allocation to another that results in at least one individual better off without making any other individuals worse off.

⁵ The idea of compensation was briefly mentioned by J.S. Mill (1825: 52–53) in his argument about the Corn Laws; see Kemp and Pezanis-Christou (1999: 443).

in the following sense. As the country moves from autarky to free and balanced trade (due to a difference between autarkic prices and the terms of trade), there exists a scheme of lump-sum transfers such that no individual is worse off post-transfer and at least one person is better off than under autarky (Samuelson, 1939: 204). It is interesting to note that Samuelson (1939: Footnote 8, 204) derived his idea of compensation not from Pareto but from Viner (1937: 533–534).⁶

In international trade theory, size is defined not in terms of overall level of economic activity but in terms of ability to influence the world price of a commodity. Formally, a country is said to be small (large) if it has no (some) power to influence world commodity prices. In the real world, many countries which are small in GDP ranking may nevertheless be large in terms of trade. Thus, for closure, a proof of the gains from trade for a large country was much needed. In another pioneering paper, Kemp (1962) significantly extended Samuelson's result to a large, price making country with many commodities and factors, and with variable factor supplies.⁷ In addition, Kemp also showed that restricted trade (by tariffs) is potentially gainful to no trade and that, for a small country, the lower the tariff the greater the potential gains from trade.

In a short and complementary paper in the same issue of the *Economic Journal*, Samuelson (1962) also extended his earlier gains-from-trade result to the large country case by the use of the Baldwin envelope.⁷⁸ Samuelson's 1939 and 1962 papers and Kemp's 1962 paper have been widely regarded as the foundation of the modern development of the normative trade theory (see, for example, Corden 1984: 72). To summarize, Montesquieu's problem can now be thought of as being satisfactorily discharged with the works of Samuelson and Kemp, which are in turn based on the Paretian principle of compensation.

Before proceeding further, it seems worthwhile to make two observations. First, note that the use of compensation allows economists to avoid the controversial use of social welfare functions in analyzing trade gains. Second, the absence of a rigorous foundation did not prevent the progress of the normative theory of trade. A good example is the development of theory of optimal tariffs according to which a trading country with power to influence world commodity prices might improve its wellbeing (under free trade) by imposing non-null tariffs on some of its imports and exports. While this idea dates back to Torrens⁹ (1821, 1824) and J.S. Mill (1844), a precise argument of optimal tariffs was formulated by Bickerdike (1906, 1907) and Edgeworth (1908). Modern developments of the theory of optimal tariffs will be briefly considered later in Section 4 of the paper. Suffice to say at this stage that Johnson's (1953–1954) contribution to the optimal tariffs theory can also be regarded as a key development in the large-country theory of trade gains.

⁶ Viner was Samuelson's teacher at the University of Chicago.

⁷ In fact what Kemp (1962) did was to offer the first demonstration that, for a country of any size, there exists a suitable lump sum compensation scheme such that no individual is worse off under free trade than in autarky. This slightly incomplete demonstration of trade gains was later rectified in Kemp and Wan (1972).

⁸ The consumption possibility frontier for a large country, constructed as the envelope formed by moving the foreign offer curve along the country's production possibility frontier (see Baldwin, 1948).

⁹ Torrens (1815) was popularly known as the co-discoverer with Ricardo of the theory of comparative advantage.

2.2 *Subsequent Progress*

The modern literature on normative trade theory has grown significantly, especially after the early 1970s. Most of this literature is primarily concerned with the circumstances under which trade can be shown to be gainful (or harmful) to a trading nation. In this sense, it is possible to broadly identify two major strands of the literature. The first strand deals with the formalization and extension of results concerning the gainfulness of trade in the context of perfect competition, which can be characterized in terms of finiteness of the economy, price taking behaviour, absence of all allocation-distorting phenomena and barter trade. The second strand encompasses efforts to establish the gains from trade outside the perfect competition framework. This includes attempts to study the gains from trade in the presence of overlapping generations (OLG), strategic behaviour, allocation-distorting phenomena or money.

A major advancement in the first strand of this literature is the proof of the existence of a perfectly competitive equilibrium (Arrow and Debreu, 1954; McKenzie, 1954). Of particular interest to trade theorists is McKenzie's short and elegant proof of the existence and uniqueness of a competitive equilibrium in Graham's model of world trade using Kakutani's fixed point theorem. The Walras–Arrow–Debreu–McKenzie (WADM) model soon became a standard tool in the analysis of problems relating to the gains from trade. However, general propositions concerning the gains from trade using the WADM approach only appeared just over 40 years ago (Grandmont and McFadden, 1972; Kemp and Wan, 1972; Ohyama, 1972).¹⁰ Since then, thanks to the efforts of many scholars, the theory of the gains from trade has been substantially extended, to encompass many different situations and under more relaxed assumptions within the perfect competition paradigm. A good example is the Kemp–Vanek–Ohyama–Wan theorem concerning gains from trade in the presence of customs unions (to be elaborated in the next section).

The extension of the cherished results concerning the gainfulness of trade to economies which are of infinite dimensions, or which embody market distortions, or which make use of money, has been a difficult and challenging task. This issue will be further discussed in later sections of the paper. Suffice to say at this stage that

- the problem of potentially harmful trade has been well known in the normative trade literature for some time (see, for example, Kemp, 1969: Chapter 12, Sections 8–11);
- there are no general propositions about the gain from trade outside the perfect competition framework (e.g., a general proposition which applies to all monetary or all OLG economies is missing); and
- many of the propositions relate the gainfulness or otherwise of trade to the properties of the free-trade equilibrium itself, not to the fundamental attributes of the world economy (e.g., trade is gainful under non-constant returns to scale if all industries with increasing (decreasing) returns to scale expand (contract) when the opportunity to trade is available) (see, for example, Kemp and Negishi, 1970).

¹⁰These important findings were discovered independently and published simultaneously. Although Ohyama side-stepped the problem of existence of a world general equilibrium, his work contained several new results, especially Propositions 1–4 and 23 (Ohyama, 1972: 49–50, 66).

In short, general propositions (without special conditions) about the gains from trade have been firmly established in the WADM model of finite, barter, competitive economies. They will be further explored in Section 4 of the paper. However, there are no corresponding general propositions about the gains from trade in a non-WADM context. The potential gainfulness of trade can only be ascertained in non-WADM models by imposing some non-trivial condition(s). Thus, after more than 250 years since Montesquieu's letter to Domville, the search for the most relaxed assumptions that generate the most general results in the normative theory of international trade is still ongoing.¹¹ There is no evidence that this process will end any time soon as new and interesting problems continue to emerge.

3. Structure of Propositions in Normative Trade Theory

From a theoretical perspective, any rigorous proposition concerning the gains from trade must necessarily consist of four indispensable components:

- (i) the specification of trading nations (preferences, technology, endowments, market structure and market distortions);
- (ii) the existence of the world's autarkic equilibrium;
- (iii) the specification of a suitable scheme of transfers; and
- (iv) the existence of the world's post-trade equilibrium under compensation.

It seems useful to make some brief remarks concerning each of the above four components of normative trade theory.

3.1 Specification of the World Economy

There are many different ways to characterize a trading world. They include, for example, dimensionality (number of factors, number of commodities and number of countries), world market power (small or large countries), trade policy (free, restricted, trade grouping, etc), traded goods (final goods, services, intermediate goods, capital goods, natural resources, labour, technology, securities), commodity tradability (tradeables or non-tradeables), legality of trade (legal or illegal), market structure (perfect competition or imperfect competition), firm behaviour (price taking or strategic), production technology (constant or variable returns to scale), market distortions (minimum wages, taxation, externalities, public goods, imperfect information, etc), market system (complete or missing), economy (market based or command), time (static or dynamic), natural resources (renewable or nonrenewable), economic agents (representative or heterogeneous, immortal or short lived, price taking or strategic), method of exchange (barter or monetary), technology and preferences (trade independent or dependent), economic growth (exogenous or endogenous)

¹¹ This process is beautifully summarized by Debreu (1991: 4) who, in his presidential address to the *American Economic Association*, stated "... [Mathematics] ceaselessly asks for weaker assumptions, for stronger conclusions, for greater generality. In taking a mathematical form, economic theory is driven to submit to those demands ..."

and consumption time constraint (consumption takes time).¹² Note that some assumptions go hand in hand, e.g., a perfectly competitive market is consistent with price taking and immortal agents, constant returns to scale and perfect information.

3.2 Autarkic Equilibria

It is customary and sensible to assume that all trading nations possess autarkic equilibria. However, the movement from autarky to trade may be uni-directional, i.e., the process of international trade is irreversible. Kemp (2003) argued plausibly that many countries have grown to be trade dependent to the extent that they cannot possibly survive in autarky if trade is abolished now. He went on to demonstrate that the absence of autarkic equilibrium, even for one trading nation, can give rise to the absence of the world trading equilibrium.

3.3 Compensation Scheme(s)

The existence of a suitable compensation scheme is necessary for ensuring the potential gains from trade for any trading country. In this subsection, we will consider three fundamental questions concerning such schemes, namely,

- What information is needed to implement such a scheme?
- Is non-lumpsum compensation feasible?
- Should compensation be hypothetical or actual?

Each of the above questions will be briefly discussed in turn below.

First, there is a widespread belief that the implementation of compensation requires detailed and reliable information which is unlikely to be attainable. To counter this perception, Kemp and Wan (1993) argued that there exists a compensation scheme of lumpsum transfers which is applicable over a wider domain and the implementation of which relies on more accessible information than any of its competitors, lumpsum or otherwise. This is known as the Grandmont–McFadden–Grinols (GMG) scheme of compensation, so named after Grandmont and McFadden (1972) and Grinols (1981; 1984).

A very important property of the GMG schemes, not explicitly noted by Grandmont and McFadden or by Grinols, is that such schemes are independent of the characteristics of the world economy. In particular, if the world economy prevails before and after the opening of trade, GMG compensation does not require knowledge of the preferences, technologies or derived excess demand functions of any economic agents. In this case, it would suffice to know the autarkic consumption of each individual, the autarkic production vector of each firm and the autarkic shareholdings of individuals. This makes the informational requirements of the GMG scheme less demanding than those of competing schemes such as those proposed by Kemp and Wan (1972) and Dixit and Norman (1980).

¹²Time-consuming consumption, dated back to the largely ignored work of Gossen (1854/1983), represents a relatively recent development in the pure normative theory of trade. Kemp (2010b) and Tran-Nam (2010; 2015) have shown that the conventional gains from trade survive the fact that consumption takes time.

Second, until 1980, compensation in the context of trade¹³ was typically understood to be in the form of lump sum transfers. Dixit and Norman (1980) argued that lump sum transfers are not necessary and that carefully chosen taxes on goods and services can always make free trade Pareto superior to autarky. The basic idea is that taxes and subsidies are chosen to freeze consumer prices at their autarkic levels. The efficiency gains realized on the production side would then allow the government to pass the positive budget surplus from this redistribution scheme to consumers. Since taxes and subsidies do not suffer from the incentive incompatibility problem, Dixit and Normans' proposition, if it was true in general, would be extremely attractive provided that non-lumpsum compensation requires less information or more accessible information.¹⁴

However, Kemp and Wan (1986a) showed that Dixit and Normans' non-lumpsum compensation claim only holds true in some cases.¹⁵ Further, Kemp and Wan (1986a) constructed examples of WADM economies to show that there are cases in which free trade is superior to autarky if and only if the compensation of losers is effected by lump sum transfer and that there are cases in which free trade is Pareto superior to autarky if and only if compensation is not lump sum. In response, Dixit and Norman (1986) identified more specifically the conditions under which their proposed scheme will lead to welfare improvement. Subsequently, Kemp and Shimomura (2001b) demonstrated that in a very general economy, trade is still potentially better than autarky but compensation may require both (*ex ante*) lumpsum and (*ex post*) non-lumpsum transfers.

Third, the gains from trade can be at most recognized as potential unless a suitably chosen compensation scheme has been successfully carried out. Despite its relevance in the context of trade, the important question of whether compensation should be actual or hypothetical has often been neglected in the literature. There appear to be two contrasting views in this regard. The new school of welfare economics, based on the work of Kaldor (1939) and Hicks (1939), has argued that compensation need only be hypothetical (feasible but not necessarily carried out). This line of thinking has been enthusiastically expounded by authors such as Schumpeter (1949: 163) and Chipman (1976: 92–93). However, relying on Pareto's original writing (see Pareto (1894)) translated into English, Kemp and Pezanis–Christou (1999) was able to reaffirm that Pareto had in mind actual, rather than hypothetical, compensation. This interpretation is at variance with a popular strand of welfare economics mentioned above.

Two implications, one theoretical and one practical, of actual compensation deserve special attention. It is interesting to note that, in a general case, an implemented scheme of transfers may change the terms of trade and, as a result, winners and losers before compensation may not be winners or losers, respectively, after a partial compensation not involving them. Further, the implementation of a compensation scheme is unlikely to be costless. If the costs of implementing a compensation scheme are sufficiently large, it is conceivable that all the gains from trade can be wiped out or even exceeded.

¹³ For non-lumpsum transfers in other contexts, refer to Diamond and Mirlees (1971) and Atkinson and Stiglitz (1980).

¹⁴ It appears that the Dixit–Norman redistribution scheme may not only be more informational demanding than the GMG scheme but also require variable tax rates.

¹⁵ Their initial example contained an inconsequential numerical error, which was later corrected and reprinted in Kemp (1995: Chapter 23).

3.4 Post-trade Equilibria

It is commonly taken for granted that there exists a world equilibrium following trade. Such a presumption may not hold if one is willing to work with a very general world economy. For example, Kemp and Shimomura (2001b) constructed a world economy with no restrictions on the number of products, factors of productions and countries, or on the nature of returns to scale (i.e., increasing returns to scale is not excluded). Moreover, preferences, technologies and endowments can vary from agent to agent. If agents behave strategically then trade, subject to the existence of a post-trade world equilibrium, is potentially better than autarky. In this very general model, the existence of a Cournot–Nash general equilibrium needs to be assumed because the production possibility set can be non-convex under the assumption of increasing returns to scale. This is the price to be paid when dealing with too general a model.

4 Core Propositions of Normative Trade Theory

In the normative theory of international trade, there are many different results, sometimes contradicting, depending how the world economy is described. Some results are fairly general under relaxed assumptions while others rely on special conditions or specific functional forms. It is therefore helpful, especially from an expositional point of view, to group the various results into sets of small number of related and consequential propositions. To this end, one might rely on the traditional dichotomy between WADM and non-WADM models.

Before proceeding further, two remarks can be beneficially made. First, unlike the positive theory of international trade, the normative theory of trade does not seem to suffer from the dimensionality problem (number of factors, number of commodities and number of countries). In fact, as mentioned previously, the foundation papers by Samuelson (1939, 1962) and Kemp (1962) analyzed a very general competitive economy with many factors and many commodities. Similarly, some extensions are trivial while others are not. For example, incorporating transport costs into a trade model represents a conceptually trivial extension while allowing factor mobility is not a trivial extension.

4.1 Within the WADM Framework

Within the WADM framework, general propositions concerning the potential gainfulness of trade have been established. These results can be grouped into five core propositions as follows.

Proposition 1 (Gains from trade)

For any country, large or small, free trade or restricted trade (by trade tariffs) is potentially better than no trade.

As mentioned previously, Grandmont and McFadden (1972), Kemp and Wan (1972) and Ohyama (1972) provided the first rigorous proof that free trade is potentially gainful within the WADM framework. In addition, Kemp and Wan (1972) and Ohyama (1972)

also proved the potential gains from restricted trade (limited to trade taxes and subsidies) in their papers.

Proposition 2 (Optimal tariffs):

A large country can improve its trade gains by imposing a non-null vector of tariffs on its imports and exports.

The above proposition suggests that restricted trade (arising from trade taxes and subsidies) may be superior to free trade, at least from the home country's point of view. It gives rise to three related issues (i) how can a large country choose its tariff vector to maximize its wellbeing, (ii) what happens when other countries retaliate with similar tariffs, and (iii) can the optimal tariff vector ever be null or have negative elements? These three questions constitute the essence of the optimal tariff theory. Each of them will be briefly considered in turn.

First, as discussed in Section 2, Bickerdike (1906, 1907) and Edgeworth (1908) provided governments with the necessary formulae for calculating optimal tariff vectors. Their works were substantially expanded by Lerner (1934), Kaldor (1940), Scitovszky (1942) and Johnson (1951–1952). Second, Johnson (1953–1954) derived the conditions under which Proposition 2 survives tariff retaliation by other countries. If each country's optimal tariff is conditional on that of the other country then it is possible that both countries will be worse off than under free trade; see, for example, Johnson (1953–1954), Syropoulos (2002) and Wan and Zhou (2008).

Third, the conventional wisdom that the optimal tariff vector must be positive was challenged by Graaff (1949: 53, 1957: 130) who stated without proof that the optimal tariff vector of a large trading economy may be null or contain negative elements. Kemp and Shimomura (2000) were able to reconcile Proposition 2 and Graaff's insight by showing that (i) under very conventional assumptions, the optimal tariff vector is null only in the uninteresting case that the home country does not trade when free trade is available, and (ii) under nonconventional assumptions, there may exist a non-trivial post-trade equilibrium with an optimal tariff vector consisting of all zeroes or some negative elements.

Proposition 3 (Price divergence and Terms of trade)

For a small country, (i) the gains from trade are greater the further away autarkic prices from world prices, and (ii) an improvement in the terms of trade is beneficial.

Proposition 3(i) was first casually conjectured by Samuelson (1939: 203). To tackle the issue, it is obviously necessary to define the sense in which one set of world prices can be said to diverge more than another from the autarkic set. A popular approach was proposed by Kemp (1962: 808) and later generalized by Ohyama (1972: 52). Using his own definition of price divergence, Kemp (1962: 808–811) sought to prove Proposition 3(i). Krueger and Sonnenschein (1967: 121) pointed out that Kemp's proof was in reality a proof of a weaker version of Proposition 3(ii)¹⁶ but Proposition 3(i) is nonetheless true

¹⁶ According to Krueger and Sonnenschein (1967: 121), Kemp (1962: 808–811) in fact proved that if the terms of trade improve, it is possible for the small home country to consume at least as much of each commodity without employing more of any factor.

under Kemp's definition of price convergence. They went on to offer a formal proof of Proposition 3(i). Finally, Kemp and Wan (1972: 518) established Proposition 3(i) in the context of the WADM model with variable factor supplies.

Although Proposition 3(ii) is intuitively clearer than 3(i), a formal definition of what is meant by an improvement in the terms of trade is still needed. A definition based on the Laspeyres price index was provided in Krueger and Sonnenschein (1967: 123). Under this definition, Proposition 3(ii) was then established with fixed factor supplies (Krueger and Sonnenschein, 1967: 136). This result was extended to variable factor supplies in the WADM context by Kemp and Wan (1972: 518).

Corresponding to the price divergence is the factor endowment divergence. It is interesting to establish whether or not greater international differences in relative factor endowments produce greater gains from trade. This proposition, if it was true, might be viewed as a normative companion to the familiar Heckscher–Ohlin theorem. Working with a simple WADM model of two factors and two commodities, Kemp and Tran-Nam (2009) showed that the answer to this question is in general negative although necessary and sufficient conditions can be derived to ensure the validity of such a proposition. Note that any attempts to accommodate more than two commodities or two factors of production would require conceptual adjustments of their analysis.

Proposition 4 (Customs unions)

Any two or more trading countries can form a mutually advantageous customs union without harming any excluded countries.

A customs union is a trading arrangement among countries in which member countries agree to trade freely within the union and adopt a common external tariff with respect to imports from the rest of the world. The traditional economic analysis of customs unions is based on the work of Viner (1937, 1950) who coined the terms trade creation and trade diversion. In his classic book, Viner (1950), a free trade advocate who had earlier viewed customs unions as a forward step toward freer trade (see Viner 1931: 10), demonstrated that trade diversion could cause welfare losses. His ideas were further developed by Meade (1955), Lipsey (1957, 1970), Johnson (1962: Chapter 3, 46–74; 1965), Corden (1972) and many others.

In view of the Vinerian analysis it is important to establish whether or not the potential gains from trade in the presence of a customs union can be ascertained in general. This idea appears to be independently stated by Kemp (1964) and Vanek (1965), and subsequently proven by Ohyama (1972) and Kemp and Wan (1976). In particular, Kemp and Wan (1976) proved the Kemp–Wan proposition which states that a group of two or more trading nations can form a customs union and choose a common tariff vector and a system of intra-union lumpsum compensatory payments such that all individuals within the union are better off and no individual outside the union is made worse off. The beauty of this remarkable proposition is that it includes the gains from worldwide free trade as a limiting case when membership of the customs unions is extended to all trading countries. However, a complete proof of the Kemp–Wan proposition only appeared a decade later in Kemp and Wan (1986b).

It is interesting to note that the traditional Kemp–Vanek–Ohyama–Wan approach does not allow for behavioural responses by non-member countries. Kemp and Shimomura (2001a) subsequently extended Proposition 4 to the situation where, after the formation of the union, each excluded country responds by choosing an optimal tariff vector. The Kemp–Shimomura proposition remains valid in the mixed case in which some excluded countries always choose the same tariff vector and others always choose an optimal tariff structure.

Proposition 5 (Free trade associations)

Any two or more trading countries can form a mutually advantageous free trade association without harming any excluded countries.

A free trade association differs from a customs union in that members of a free trade association do not have to adopt a common external tariff with respect to imports from outside the free trade area. Surprisingly it took a long time to establish the equivalence of the Kemp–Wan theorem for free trade associations. Kemp (2007) demonstrated that Proposition 5 holds true for any form of free trade association. It was also shown that corresponding to each free trade association there is a Pareto preferred Kemp–Wan customs union. Like the Kemp–Vanek–Ohyama–Wan theorem, Proposition 5 includes Proposition 1 as a limiting case when membership of the free trade association is extended to all trading countries.

4.2 Outside the WADM Framework

In some cases, it is possible to carry the various core propositions to a non WADM economy. For example, if market distortions are limited to non-negative taxes on imports and exports then the above core propositions can be preserved. However, outside the WADM model, it is generally not possible to make over-sweeping claims such as Propositions 1 to 5 without making additional assumptions which are often not trivial. Broadly speaking, despite some recent progress, normative trade theorists have not yet been able to establish a general proposition that describes the conditions which are compatible with trade gains and conditions which are compatible with trade losses.

Markusen (1981) offered possibly one of the first models with a general equilibrium approach to gains from trade under imperfect competition. His model is a two-country, two-good, two-factor world in which the production of one good is monopolized in both countries. Under the assumption of Cournot–Nash behaviour, trade leads to aggregate welfare improvements in both countries if they are identical in all respects. With constant returns to scale but countries differ in size, trade is still potentially gainful in the sense that world real income increases as a result of trade. Further, Helpman (1984) developed a rather general framework for analyzing trade gains under the assumption of imperfect competition and increasing returns to scale, and derived a sufficient condition for aggregate gains from trade.

A particularly influential approach to the gains from trade in a non WADM setting is the strategic trade theory. Based on the pioneering work of Spencer and Brander (1983) and

Brander and Spencer (1985), this theory describes the policy certain countries can adopt in order to affect the outcome of strategic interactions between firms in an international oligopoly model. More specifically, the level of welfare in a trading country can be raised by shifting profits from foreign to domestic firms via the use of export subsidies, import tariffs, and subsidies to R&D or investment for firms facing global competition. In some sense, the strategic trade theory can be viewed as the non WADM counterpart of Proposition 2 on optimal tariffs. However, it is noted that the strategic trade theory has employed the partial equilibrium approach.

The most general counterpart of Proposition 1 outside the WADM paradigm is perhaps one by Kemp and Shimomura (2001b). In their model, no restrictions are placed on number of products, number of factors or the nature of returns to scale. Moreover preferences, techniques and factor endowments can differ between agents. Kemp and Shimomura demonstrated the potential gainfulness of free trade in a Cournot–Nash general equilibrium where neither increasing returns nor trade-induced changes in the strategy sets of individual agents are ruled out. There appears to be no other gains-from-trade proposition under assumptions of imperfect competition of comparable generality. However, the price of working with such a general model is that the economy’s post-trade equilibrium must be assumed.

To demonstrate the point further let us consider the gains from trade in the presence of public goods. It is well known that public goods (non-rival and non-excludable in consumption) pose a particular difficulty for the WADM model.¹⁷ However, the potential gainfulness of trade in the presence of public goods can still be established under three alternative sets of sufficient conditions:

- Condition α : In each country, the aggregate net production vector of pure public goods under free trade is maintained at its autarkic level (Kemp, 2001: 61–62).
- Condition β : all public goods are both pure and strictly *local*, benevolent governments play a Cournot–Nash game with the public goods as strategic variables, and the game has a solution, not necessarily unique (Shimomura, 2007).
- Condition γ : This approach can accommodate a worldwide mixture of pure and impure, local and non-local public goods. In this general setup, trade can be shown to be potentially gainful provided that there exists a set of public good associations, each with its own system of Scitovszky lumpsum transfers, to localize the non-local public goods (Kemp, 2011; Kemp and Tran-Nam, 2012).

5 Pareto Harmful Trade and Difficult Problems

5.1 Pareto Harmful Trade

In the WADM framework, uncompensated trade (free or restricted) is incomparable with

¹⁷ Walras (1874) recognized explicitly that his analysis was based on the complete neglect of public goods. This is clear from the definitive edition of the *Elements*, translated by Jaffé in 1954; see page 257 of Jaffé’s translation. That Walras was explicit on this point in all editions has been confirmed by Dockès et al. (1988).

autarky in the sense that some people are better off while others are worse off as a result of moving from autarky to trade. Outside the WADM framework, it is conceivable that either uncompensated trade can be Pareto inferior to autarky or it is not possible to find a compensations scheme to ensure the gainfulness of international trade. This subsection provides a summary overview of Pareto harmful trade. The discussion is not intended to be exhaustive. It does not consider, for example, the possibilities of welfare reducing trade due to poor trade policy (e.g., choice of an appropriate tariff structure by a government or by member countries of a trade diverting customs union).

The formal recognition of theoretical possibilities of Pareto harmful trade dates at least back to Kemp (1969: Chapter 12, Sections 8–11). Market distortions, for example, generate two possible outcomes. First, the extent of misallocation of resources may be greater under free trade than in autarky. Second, in the presence of market distortions, multiple equilibria, both in autarky and under free trade, are possible with no assurance that a country will choose a Pareto preferred free trade equilibrium. However, in most examples of welfare reducing trade, it is possible to find ways to restore the standard gains-from-trade propositions. In some cases, Pareto harmful trade also provides a theoretical justification for government intervention.

Many examples of Pareto harmful trade have now been constructed in the literature. A reasonable way to classify this subset of normative trade theory literature is by how these examples violate the conditions that characterize the WADM model as follows:

- infinite models of OLG, e.g., Kemp and Long (1979), Fried (1980), Tran-Nam (1985);
- increasing returns to scale, e.g., Kemp (1969: 271), Kemp and Negishi (1970);
- oligopoly, e.g., Fujiwara (2005);
- public intermediate goods, e.g., Suga and Tawada (2007);
- imperfect information, e.g., Newbery and Stiglitz (1984), Shy (1988); and
- monetary economies, e.g., Kemp (1990), Palivos and Yip (1997).

A common thread of Pareto harmful trade literature is incomplete market structure. The notion that competitive but incomplete markets may fail to generate an optimal equilibrium in a closed economy context was first explicitly recognized in Samuelson's (1958) Impossibility theorem. Hart (1975) also demonstrated that market equilibria may be constrained suboptimal in a finite economy with incomplete markets. Not surprisingly, many examples of Pareto harmful trade such as Kemp and Long (1979), Newbery and Stiglitz (1980), Fried (1980), Tran-Nam (1985) and Shy (1988), involved incompleteness of markets. Kemp and Wan (1993: 33–34) also offered a Hart-type open economy example in which the autarkic equilibrium is Pareto preferred to the free trade equilibrium.

However, when all markets are opened, the standard proposition about the gainfulness of trade can be restored. For example, in the context of OLG and exhaustible resources, Kemp and Long (1979) showed how Pareto harmful (uncompensated) free trade can be removed by the creation of a sufficiently large stock of bonds. Similarly, a complete set of securities markets in Newbery and Stiglitz's (1980) model of trade under uncertainty can ensure that free trade is preferred to no trade. In Tran-Nam's (1985) model of bilateral

trade with OLG, uncompensated trade was shown to be Pareto inferior to no trade in some cases. However, if free trade can take place through a democratic voting process,¹⁸ then it is possible to find country-specific intergenerational transfer schemes to make compensated trade potentially gainful to both countries.

Another interesting thread of the Pareto harmful trade literature is the shape of the production possibility frontier and pattern of post-trade production. It is well known from the Heckscher–Ohlin–Samuelson model that a trading country will incompletely specialize in production as a result of trade. However, in the presence of increasing returns to scale with sufficient severity (to make the production possibility frontier convex to the origin), then incompletely specialized free trade is necessarily harmful provided that the autarkic equilibrium is optimal (Kemp, 1969: 271). Similarly, in the presence of a public intermediate, the production possibility frontier may also be convex to the origin (Suga and Tawada, 2007: 286). Thus, a country may lose from trade if it incompletely specializes after trade.

Money can be a cause of welfare reducing trade. Taking the money-in-the-utility-function approach, Kemp (1990) was able to show that free trade or an improvement in the terms of trade might be harmful to a monetary economy.¹⁹ Under certain conditions, the traditional production and consumption gains may be swamped by a loss of satisfaction from holding cash when relative prices change. Palivos and Yip (1997) considered a small open economy under a flexible exchange rate regime where free trade of assets fixes the real interest rate at the world level. In such a context, it was shown that if the consumption of exportables requires larger cash balances than the consumption of importables, then free trade is Pareto harmful compared with autarky although appropriate government policy can restore the gainfulness of trade.

5.2 Difficult Problems

To close this paper, it seems appropriate to briefly examine various normative trade problems that deserve the attention of economic theorists. First, currently there are virtually no theoretical studies of the gains from trade in the context of sequential economies (i.e., intertemporal competitive economies in which commodity markets must be open in every time period instead of opening only once in the initial time period as in the WADM model) where there are false expectations associated with them. Thus, it is important to formally establish the conditions under which international trade is potentially gainful (or harmful) in sequential economies in which spot prices that emerge in the future need not be consistent with agents' current expectations (refer to Radner 1972 for a detailed discussion of such economies).

Second, it is difficult to accommodate internally increasing returns to scale and household strategic behaviour. Kemp and Shimomura (2001b) have shown that trade remains potentially gainful in such a general economy, but their result assumes the

¹⁸ There are in cases in which bilateral trade cannot take place under a majority voting rule in both countries.

¹⁹ Money in the production function would have generated the same possibility.

existence of equilibrium.²⁰ Although Nishimura and Friedman (1981) did provide a set of sufficient conditions for a static, finite economy in which households possess market power and behave strategically, there is still a need to prove the existence of equilibrium in the Kemp–Shimomura type of model, and, if possible, extend it to economies with OLG and infinite horizons.

Third, it is also very difficult to accommodate both OLG and intergenerational caring (of parents for their children or children for their parents). Although Kemp and Wolik (1995) have shown that the standard theorem of gains from trade carries over to an economy with OLG, an infinite horizon and price taking behaviour by households and firms, their finding assumes that there are no intergenerational bequests and no gifts *inter vivos*. The strategic relationships of two pairs of parents in law, each pair aware of the relationship, will generate two complications: (i) the uncertainty about equilibrium, and (ii) the extent of resource misallocation caused by these strategic relationships may be exacerbated by the introduction of free trade. A very recent attempt to address this issue has been made by Kemp and Fishburn (2013). It was shown that while none of the core propositions survives the recognition of inter-generational bequests nevertheless, under a simple (but non-trivial) additional assumption, each of the core proposition holds true.

6. Concluding Remarks

In conclusion, normative trade theorists have long been striving to answer two basic questions. First, in what sense can trade be regarded as gainful (or harmful) to a country? Second, what are the circumstances under which trade is gainful (or harmful) to a trading country? The first question can be thought as having been satisfactorily discharged by Pareto. However, the answer to the second question is still incomplete despite tremendous progress the past 45 years, especially in the case of finite, competitive, barter economies. The answer is incomplete in the sense that there is no general proposition that describes the conditions which are compatible with trade gains and conditions which are compatible with trade losses. While rigour in normative trade theory has been achieved with the help of the Paretian concept of welfare improvement and the perfect competition model, the relevance of the normative theory of trade might still be greatly improved by demonstrating the gains (or harm) from trade in more general situations including OLG, increasing returns to scale, strategic behaviour and monetary economies.

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²⁰ The stumbling block is the inability to establish the existence of equilibrium when the quantities produced are strategic variables drawn from non-convex sets.

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