

Deconstructing the Theory of Comparative Advantage¹

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Abstract

This article critically examines the theory of comparative advantage, which underlies the wide-spread support of worldwide trade liberalisations. Both the classical and neoclassical formulations of it are shortly discussed and its essential assumptions are scrutinised. These include the international immobility of capital and labour, balanced trade, the existence of an adjustment mechanism which is responsible for the transformation of comparative production advantages into absolute price advantages, full employment and the perception of international trade as a static and harmonious phenomenon. It is shown that all these assumptions are neither theoretically valid nor do they coincide with empirical research. The whole rationale why international trade exists according to this theory is deficient. The New Trade Theory, which claims to enhance the theory of comparative advantage, is unconvincing as a complement. It is concluded that the theory of comparative advantage should be dismissed. International trade theory, by relying on this theory, risks ignoring the most relevant and important elements with regard to international trade. The deficiencies of the theory of comparative advantage are especially crucial for trade policies that are derived from this theory, which is discussed with reference to the WTO and its ongoing Doha Round.

Key words: International Trade; Trade Theory; Comparative Advantage, Trade Policy, WTO

1. Introduction

Economists favour unrestricted international trade nearly unanimously. Polls in the last decades show that there is an overwhelming academic support for free trade among the profession (Kearl et al. 1979; Frey et al. 1984; Alston et al. 1992; Fuller and Geide-Stevenson 2003), which is unabatedly high. Theoretically, this support is underpinned mainly by the theory of comparative advantage. It shows why free trade is beneficial for all nations as well as the world as a whole and how free trade automatically leads to the realisation of those benefits. This theory dominates international economics or, more precisely, the theory of international trade. It is widely praised and has been vaunted as the “deepest and most beautiful result in all of economics” (Findlay 1987, p. 514) and as “an unassailable intellectual cornerstone” (Harrigan 2003, p. 86). Samuelson calls it the only proposition in social science that “is both true and non-trivial” (Samuelson 1972, p. 683). Some even argue that it has become “something of an article of faith” (MacDonald and Markusen 1985, p. 277) in modern economics. This theory is used to argue that it is of central importance for poor nations to open markets and to join a free trade regime in order to raise living standards. The whole WTO process of trade liberalisation that assumes that global economic welfare can be maximised through free trade has its theoretical foundations in the theory of comparative advantage.

The use and support of this theory, however, is surprising once its framework is considered. It rests on the assumptions that labour and capital do not move between nations, that there are no trade imbalances, that all resources are always fully employed and that international trade can be described by a comparative-static model. These assumptions are neither self-evident nor self-explanatory at the first glance. Rather, they evoke questions concerning their usefulness and adequacy. Therefore, this article tries to

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examine these assumption and with it the theory of comparative advantage.

Before this is done, a short introduction to the theory is given, which is closely linked to the name David Ricardo,² who formulates it in chapter 7 of his main work *On the Principles of Political Economy and Taxation*. Succeeding classical³ and neoclassical economists adopted this theory. The latter reformulated it to fit it into the marginal analysis framework, which is the fundament of neoclassical economics. This neoclassical or modern formulation of the theory of comparative advantage is the basis of the most widespread trade models and is used in textbooks on international economics. Both the classical and the modern formulation share the same basis and logic. They both consist of a normative dimension, which shows that free trade is advantageous for all participating nations, and a positive dimension, which describes how each nation specialises according to its comparative advantages automatically.⁴

Afterwards the assumptions will be scrutinised and the “magic of comparative advantage” (The Economist 2009, p. 13) disenchanting. I will focus on those assumptions that are, as will be shown, crucial and essential to the theory of comparative advantage regardless of its specific formulation. These assumptions are discussed and analysed concerning their theoretical and logical consistency as well as their empirical accuracy. The surface impression regarding the usefulness and adequacy is confirmed. It is shown that all these assumptions have both theoretical as well as empirical deficiencies. Hence, the conclusion is drawn that the theory of comparative advantage is all but irrelevant to international trade and is inadequate for explaining free international trade. However, these deficiencies are especially crucial for trade policies that are derived from this theory, which is discussed with reference to the WTO and its ongoing Doha Round.

2. Classical formulation

Ricardo⁵ is the first economist who distinguishes international trade from domestic trade (Blaug 1977, p. 126). He wants to show that international trade follows different rules than domestic trade (Ricardo 2004b, p. 133).⁶ This distinction is based on the assumption that labour and capital do not move between nations as they do inside a nation. The reasons for the immobility of capital are “the fancied or real insecurity of capital, when not under the immediate control of its owner, together with the natural disinclination which every man has to quit the country of his birth and connexions, and intrust himself with all his habits fixed, to a strange government and new laws” (Ricardo 2004b, p. 136). The immobility of labour also originates from the latter reason. Therefore, free international trade is determined, unlike free domestic trade, by comparative production advantages.

England and Portugal

Ricardo believes that free international trade is desirable and that nations and their populations benefit from it.⁷ He demonstrates this point with his famous England-Portugal example, in which both nations initially

² Many attribute the credits for its discovery to Robert Torrens. Since Ricardo's formulation is referred to most often by economists, I will concentrate on him. For an early discussion of the role of Torrens see Seligman and Hollander (1911). For a list of literature on the discovery controversy and a discussion of it, see also Ruffin (2002), Aldrich (2004) and Maneschi (1998, pp. 51-57).

³ In this article, the term ‘classical’ describes Ricardo and his successors, not his precursors like Adam Smith who did not use the theory of comparative advantage.

⁴ Despite the fact that the theory of comparative advantage is often acknowledged as a ‘pure’ theory of international trade, it relies on a monetary mechanism which is an essential part of it.

⁵ Ricardo's approach, as presented here, differs from the so called Ricardian model that can be found in most textbooks of international economics. The latter tries to reconstruct Ricardo's theory with neoclassical tools and assumptions that Ricardo did not use. Additionally, the classical formulations was formalised mainly by John Stuart Mill. However, I will focus on Ricardo who first gave a full account of this theory and whose name is associated with it.

⁶ Adam Smith before him developed no separate theory of international trade. He rather argues that it corresponds to domestic trade: “Were all nations to follow the liberal system of free exportation and free importation, the different states into which a great continent was divided would so far resemble the different provinces of a great empire” (Smith 1904, p. 41).

⁷ Ricardo's main object of study is the distribution of wealth among the different classes of a society (capital owners, workers, and landlords). His aim is to show that “the amount of value in a country” cannot be increased through international trade and that the

produce cloth and wine. To produce the same amount of cloth, England needs 100 labourers and Portugal 90 labourers. England needs 120 labourers to produce the same amount of wine that Portugal produces with 80 labourers (Ricardo 2004b, p. 135). These different labour requirements are due to their dissimilar circumstances that result from a nation's situation, climate and other "natural or artificial advantages" (Ricardo 2004b, p. 132) and are exogenously given.

With these "four magic numbers" (Samuelson 1972, p. 678), Ricardo shows that it would be advantageous for both nations if they specialised according to their respective comparative advantage and started trading with each other. England should specialise in the production of cloth and import wine from Portugal. The opposite applies to Portugal. As a result, they would both benefit.⁸ Due to the more efficient employment of labour and capital, "the amount and variety of the objects on which revenue may be expended" (Ricardo 2004b, p. 133) and "the sum of enjoyments" (Ricardo 2004b, p. 128) increase. The whole population, as consumers, benefits from international trade because goods become cheaper and available in larger quantities. There are no other economic gains from international trade. Dynamic developments like economic growth are not integrated into the theory of comparative advantage by Ricardo.⁹

Ricardo illustrates with his example that no nation needs to fear free international trade because it will be advantageous for both nations, even if one nation has a lower productivity in all goods and the other nation produces both goods more efficiently. This shows that absolute production costs are insignificant internationally, only comparative production costs matter. If the cost ratios are different in both nations, specialisation and trade will benefit both. However, the opposite is also true, namely when production cost ratios are equal in both nations no gains can be made by specialisation. In this situation trade will not take place at all because there would be no incentive for it. Different comparative production costs are "the essential and also the sufficient condition" (Cairnes 1874, p. 371) for the existence of international trade.

The price-specie-flow mechanism

Ricardo shows not only that free trade is advantageous for nations, but also that nations will benefit automatically because free international trade leads inevitably and even unintentionally to a specialisation according to comparative advantages. Here, Ricardo draws on the price-specie-flow mechanism, which is a simple version of the quantity theory of money and was developed by David Hume (1903a, 1903b).

Ricardo and succeeding classical economists present international trade as a form of barter. It is seen as "an actual trucking of one commodity against another" (Mill 1929, p. 583). Money is seen as neutral and has only one function in international trade, namely as a means of exchange in order to facilitate trade.¹⁰ As a corollary, trade must be balanced. This is an important presumption of the price-specie-flow mechanism.

According to this mechanism, changes in the quantity of gold (and silver), which was the means of payment at the time, have no real effect, only a price effect. Thus, absolute (gold) prices, wages, etc. depend on the quantity of gold that is available inside a nation. To illustrate how this mechanism underlies the theory

distribution of wealth is not influenced by international trade because neither the general rate of profit nor wages are generally affected by it (Ricardo 2004b, pp. 128-132). The latter point is directed against Adam Smith.

⁸ In Ricardo's example England "gains the labour of 20 Englishmen" and "Portugal gains the labour of 10 Portuguese" (Sraffa 1930, p. 541).

⁹ Ricardo expounds one exceptional case in which international trade leads to an increase in the general rate of profits, namely when international trade leads to a change in the level of wages (Ricardo 2004b, pp. 128-132). In Ricardo's theory, profits and wages are mutually dependent. If wages decrease profits will increase and vice versa (Ricardo 2004b, pp. 110-111). If the prices of wage goods (necessities of the labourers) decline because they can be acquired cheaper through foreign trade, wages will fall and profits will rise. This would lead to accumulation of capital and to economic growth in Ricardo's theory. But both models – the theory of comparative advantage and the profit-increasing model – are separated in Ricardo's theory: "In fact, Ricardo used two trade models which he never managed to integrate" (Gomes 2003, p. 44). The theory of comparative advantage does not include the profit-increasing model. Furthermore, Ricardo sees the latter only as an exceptional case (2004a, p. 25; 2004b, p. 133).

¹⁰ Hume argues that this neutrality of money is only true in the long run. In the short run a change in the quantity of money does matter. If money flows into a nation and thus the quantity of money is increased, then "every thing takes a new face: labour and industry gain life" (Hume 1903a, p. 293). The opposite is true when the quantity of gold and silver diminishes and is therefore "pernicious to industry" (Hume 1903a, p. 296). Ricardo does not adopt this part of Hume's theory in his theory of comparative advantages, nor do any of his classical successors. A reason why this short run effect is neglected or even rejected by both classical and neoclassical economists, might be that it has a mercantilist connotation as Petrella (1968, p. 366) suggests.

of comparative advantage I will consider Ricardo's example of England and Portugal again. Portugal can produce both cloth and wine with less labour. Supposing that this means the gold price of both Portuguese goods is cheaper when both nations start trading, consumers from both nations buy both commodities from Portugal. England has a trade deficit, while Portugal has a trade surplus. Gold flows from England to Portugal. Portugal's prices, expressed in gold, rise. Contrary, the quantity of money in England is diminished and her prices expressed in gold fall. English commodities become cheaper and England will improve her competitive situation. This leads to a situation in which England becomes competitive in one good and will be able to sell it cheaper than Portugal, namely cloth. The outflow of money from England will gradually slow down because cloths are now exported. Finally, the prices of both goods will adjust in a way that trade is balanced, the value of imports equals the value of exports and an equilibrium state is achieved in which both nations produce the commodity they have a comparative advantage in (Ricardo 2004b, pp. 138-40). Comparative production cost advantages are thus transformed into absolute money price advantages for the consumer. This transformation is significant and necessary: the "cost of production, though it may be, and generally is, the ultimate condition governing international exchange, is never in any case the proximate or immediate cause. That proximate or immediate cause is not cost, but price" (Cairnes 1874, p. 382). Since consumers buy a good from whoever sells it cheapest, comparative production cost advantages must be transformed into absolute price advantages.

This mechanism prevents trade from being unbalanced (Hume 1903b, p. 319). A (perpetual) trade surplus or deficit is thus theoretically impossible under free trade conditions. The volume of trade may change but international trade will always be balanced at least after some time of adjustment. Ricardo has this mechanism in mind when he says that, in a free trade system, "each country naturally devotes its capital and labour to such employments as are most beneficial to each" (Ricardo 2004b, p. 133) and "the exchanges could be no otherwise in every country than at par" (Ricardo 2004b, p. 330). Although each nation seeks to maximise its own advantage, it brings about the best possible outcome because labour is distributed "most effectively and most economically" (Ricardo 2004b, p. 134).

3. The modern formulation

Neoclassical theory, which is based on marginal analysis, succeeded classical theory as leading paradigm in economics. It adopted the theory of comparative advantages and fitted it into this paradigm. Therefore, it was disengaged from properties that were not compatible with neoclassical economics, but its basis was kept. The body of the theory remained the same, only the garb changed. This modern formulation underlies today's dominating theories of international trade. Neoclassical economic tools are used to demonstrate that free international trade is beneficial for all participating nations. The exchange rate mechanism is responsible that those benefits will be acquired automatically if free trade is prevails.

Benefits from trade

In order to show that nations benefit from free international trade, modern economics uses neoclassical microeconomic tools. They include opportunity costs, production possibility frontiers, social indifference curves and optimised production-consumption equilibria in autarky. The simplest illustration uses a 2x2x2 model with two nations, two goods and two factors of production. It is assumed that both goods are produced with both factors of production and that these factors can be substituted. In such a model, the overall amount of goods that a nation can produce is illustrated by the production possibility frontier. It describes simultaneously the possible consumption of a nation in the state of autarky.¹¹ The absolute value of the slope of this frontier equals the opportunity costs of one good expressed in the amount of another good – or the so-called marginal rate of transformation. Since neoclassical economics generally assumes increasing opportunity costs, the production possibility frontier is concave to the origin. Opportunity costs are used to

¹¹ A nation will always produce at a point on this frontier according to neoclassical assumptions. A nation cannot produce outside ('above') its production possibility frontier with the existing resources and technology. Since full employment of all factors is assumed, it cannot produce inside ('below') this frontier.

determine the relative prices in a nation. The exact production point is determined by demand, which in turn is determined by so-called social or community indifference curves.¹² The optimum production composition of the economy is determined by the point where a social indifference curve is tangent to the production possibility frontier.¹³

Comparative advantages are determined by comparing national opportunity costs at the respective optima. If each nation specialises according to its comparative advantage, the overall production increases and through trade the available quantity of commodities in both nations is higher than in the state of autarky. This means, national consumption increases beyond the respective production possibility frontier and each nation can reach a higher social indifference curve. Hence, the consumers' needs are satisfied to a higher degree. In this way, free international trade is beneficial for each nation.

There are several explanations why national opportunity costs differ. Neoclassical economists in general criticise Ricardo because he does not explain the reasons for a nation's comparative advantage and they want to fill this gap. The most famous model, the Heckscher-Ohlin model, assumes that it is the effect of different endowments of factors of production. In this model, each nation has a comparative advantage "in the production of commodities into which enter considerable amounts of factors abundant and cheap" (Ohlin 1933, p. 20) in this nation and will specialise accordingly. Other models consider the demand side as well.

The gains from trade are identically in both the classical and the neoclassical formulation, namely an increase in the overall output and consumption. There are no further gains from trade. Any possible dynamic changes and gains "are completely disregarded" (Heckscher 1949, p. 274). Consumption and production are at an overall maximum. If opportunity costs are equal in both nations and thus no comparative production advantages exist, international trade will not take place, as in the classical theory.

Contrary to classical formulation, the modern formulation assumes that profit and wage rates do change, and even equalise worldwide.¹⁴ But this is only seen as a corollary of free trade and not as a gain, since neoclassical economists, unlike Ricardo and other classical economists, do not give any normative judgement about changes in income (distribution) as long as the overall gain is positive, because winners could then compensate any losers.

Exchange rate adjustment mechanism

Like the classical formulation, the neoclassical formulation of the theory of comparative advantage contains an automatic adjustment mechanism. It has the same function, namely to transform comparative production advantages into absolute price advantages, because, ultimately, absolute price differences determine the international flow of commodities. Neoclassical economists assert the assumption of balanced trade. In today's world national paper money that is not backed by gold is the international means of payment. In case of floating exchange rates, the exchange rate adjustment mechanism is responsible for such a transformation. According to this mechanism, trade imbalances cause a shift in exchange rates. The exchange rate is solely determined by trade flows. The absolute level of money prices is internationally determined by the exchange rate of a nation's currency. Trade imbalances affect the demand for currencies and result in a change of the exchange rate. The currency of the nation that experiences a trade deficit – and thus an outflow of money – will be depreciated and the currency of the nation that has a trade surplus will be appreciated. Thus, the commodities that are produced in the deficit nation will become cheaper internationally while those from the surplus nation will become more expensive. "When exports become equal to imports in money value, the exchange rate will stop moving and equilibrium will exist" (Eicher et al.

¹² Viner (1931), who first combined this concept with the production possibility frontier, used the term "demand curve." These curves are convex to the origin and are composed of points at which consumer needs are equally satisfied. Such a curve can be interpreted either as "the representative citizen" or as "community indifference" (Chipman 1965, pp. 689-98).

¹³ At this point the resources are employed most advantageous for the economy and without trade, there exists no better employment. Consumer needs cannot be satisfied to a higher degree by any other production composition.

¹⁴ The neoclassical formulation was enhanced by the factor price equalisation theorem. This can be seen as "a corollary of the Heckscher-Ohlin formulation of comparative advantage" (Nayyar 2007, pp. 71-72). It was developed by Paul Samuelson (1948) and Abba Lerner (1952) and states that "factor prices will be equalised, absolutely and relatively, by free international trade" (Samuelson 1948, p. 169). As a result, commodity trade leads to the same result as if production factors were internationally mobile.

2009, p. 65). Anytime a trade imbalance exists, the equilibrium state will be restored through this exchange rate adjustment mechanism. Money is seen as neutral. Changes in the exchange rate do not change relative prices or long run allocation of resources. As a result, each nation will automatically specialise in the production of those goods, in which it has a comparative advantage and each nation will be able to “successfully compete in world markets” (Jones 1980, p. 235).

In the case that exchange rates are fixed, neoclassical theory reasons that trade is balanced via wage rate changes. The adjustment is “performed by the price-labor relation in each country” (Haberler 1929, p. 377). The demand for labour is responsible that wages in surplus nations rise. This makes its goods more expensive while wages in deficit countries fall. This wage adjustment mechanism is then responsible for the transformation of comparative advantages into absolute price advantages.

4. Evaluating the assumptions

As was shown, both formulations of the theory of comparative advantage differ in the tools they use. Their underlying structure, however, is the same. Krugman and Obstfeld argue rightly in respect of the theory of comparative advantage that “even though much about international trade has changed, the fundamental principles discovered by economists at the dawn of a global economy still apply” (2009, p. 23). Free international trade is beneficial to all participating nations because they can increase their overall production and more can be consumed if they specialise according to their comparative advantages. Furthermore, this specialisation does not take place by accident or political intention but automatically. A mechanism exists which transforms comparative production advantages into absolute price advantages.

All theories have to abstract from reality and simplify relationships in order to construct a useful and workable framework. The question arises, however, which assumptions are reasonable to make. It must be assessed which simplifications are appropriate. The ‘gains’ in form of clarity and predictability must be balanced against the ‘costs’ in form of relevance and realism. The danger is that simplifications are made which oversimplify the reality and that improper assumptions are made which misrepresent the real world. In this case a theory risks becoming irrelevant by ignoring the most interesting causations and problems. In order to be an adequate theory of international trade and to gain useful insights into this phenomenon, the theory of comparative advantage has to have a justifiable balance between these ‘gains’ and ‘costs’ while avoiding invalid assumptions.

As will be shown, five assumptions constitute the basis of the theory of comparative advantage, which are indispensable to it: first, capital and labour are immobile internationally; second, trade is balanced and an adjustment mechanism operates which prevents trade imbalances and at the same time ensures that comparative production cost advantages are transformed into absolute price advantages; third, all factors of production are fully employed; and fourth, international trade resembles a static phenomenon that excludes dynamic changes and gains. As a consequence of these assumptions international trade is portrayed as a harmonious phenomenon, which is the fifth assumption. These assumptions will be critically examined and assessed in respect to their theoretical validity, logic and empirical relevance.

International immobility of labour and capital

Ricardo states that domestic and international trade are regulated by different rules, the former by absolute and the latter by comparative production cost advantages. The modern formulation adheres to this differentiation. Both, classical and neoclassical economists, rest this difference on the assumption that labour and capital do not move between nations. Domestically, labour and capital are assumed to be mobile and will move wherever they can gain the highest wages or profits respectively. Internationally, only the produced goods can move freely. Capital and labour are trapped domestically. While classical economists assume that workers and capital are more or less bound to a nation by nature as Ricardo states or that the scale of these

movements is negligible (e.g., Cairnes 1874, p. 368),¹⁵ neoclassical economists first adopted this argument (e.g., Haberler 1930, p. 350)¹⁶ and later developed the factor price equalisation theorem that renders such movements superfluous (Samuelson 1948). This latter theorem states that international trade leads to the same result as if capital and labour were mobile. Hence, there is no necessity for their international mobility.

Ricardo is aware that the international immobility of labour and capital is an indispensable assumption. He devotes half of his explanation of the theory of comparative advantage to the discussion of it (Ruffin 2002, p. 734). He even expounds that if this assumption did not apply and labour and capital were able to move internationally, comparative advantages would not determine international trade (Ricardo 2004b, p. 136). He illustrates this with reference to his England-Portugal example by saying that “[i]t would undoubtedly be advantageous to the capitalists of England, and to the consumers in both countries, that under such circumstances the wine and the cloth should both be made in Portugal, and therefore that the capital and labour of England employed in making cloth should be removed to Portugal for that purpose” (Ricardo 2004b, p. 136). If capital could move internationally, English capital would move to Portugal in his example and leave England. This means that comparative advantages would be irrelevant.¹⁷ Therefore, international immobility is essential to the theory of comparative advantage. Otherwise there would be no reason why free international trade should be regulated by comparative advantages.

From a theoretical point of view, however, there is no reason why capital and labour should not be mobile internationally. The classical claim that workers and capital do not move beyond national borders because they have a natural inclination to stay in one’s homeland can hardly be justified theoretically. Similarly, the neoclassical assumption, that factors are trapped domestically has no theoretical basis. The assumption that factor prices equalise, cannot justify international immobility.

In practise, workers move in significant amounts between nations. Even at the end of the 18th and the beginning of the 19th century when Ricardo developed his theory, labour migration took place in large scale, for example from Europe to America (Oswald 2007, pp. 50-54). Today, labour migration “is truly a global phenomenon” (Stalker 2000, p. 31). Migration that is driven by disparity in wages, takes place between many regions. Capital, on the other hand, moves frequently between nations. With the decrease of transport and communication costs, capital has become ever more mobile. The assertion, that capital and workers might be mobile internationally, but that their numbers are negligible, cannot be maintained. Furthermore, there is no evidence that factor-prices equalise worldwide (Subasat 2003, p. 152). This neoclassical “idea that trade should substitute for migration involves a number of assumptions distant from conditions in the real world” (Stalker 2000, p. 33).¹⁸

Consequently, there is neither a theoretical reason nor empirical evidence that labour and capital do not move internationally. Rather, both are mobile to a certain degree – similar to the domestic level. There is no support for the claim that international trade should be determined by fundamentally different rules than domestic trade on these grounds. If capital and labour are assumed to be mobile to a certain degree, comparative advantages cannot determine the pattern of international trade. It is, therefore, not surprising that models that allow for labour and capital movement show that comparative advantages do not determine trade patterns (see, e.g., Brewer (1985); Jones (2000)).

To sum up, the assumption that labour and capital are not mobile internationally lacks a logical and theoretical justification and has no empirical support. It is not an appropriate simplification of reality.

¹⁵ Cairnes is aware that labour and capital move internationally and that at least capital is ‘cosmopolitan’. Yet he concludes that this international movement can be ignored because it represents only a small fraction of the overall capital and labour (Cairnes 1874, pp. 362-364).

¹⁶ Similar, Haberler argues that labour and capital might be mobile internationally but he purposely neglects this point and assumes immobility.

¹⁷ This would also mean that free trade is not necessarily advantageous to both nations because the “flight of capital and labor would be detrimental to England and its remaining population as a whole” (Anspach 1968, p. 515).

¹⁸ It is hardly imaginable that, for example, wage levels equalise in poor and rich nations solely as a result of free trade (Lutz and Lux 1988, p. 286). Pritchett calculates that in the period from 1870 to 1990, while the volume of international trade increased significantly, the income ratio of the richest to the poorest nations, measured in GDP per capital, increased by the factor five. The ratio increased from 8.7 in 1870 to 45.2 in 1990 (Pritchett 1997, p. 3).

Balanced trade and adjustment mechanism

A second crucial assumption is that trade is balanced, meaning that the value of imports equals the value of exports of each nation. This assumption is a corollary of the fact that trade is comprehended as barter. Ricardo insists that international trade takes place as if it “were purely a trade of barter” (Ricardo 2004b, p. 137), a presumption that is maintained by both later classical economists and neoclassical economists.

Balanced trade is essential for the theory of comparative advantage because the adjustment mechanism that results from it is responsible for the transformation of comparative production cost advantages into absolute price advantages. This transformation is vital, because consumers buy goods from whoever offers them at the lowest money price. Consumers are neither aware of nor interested in comparative production costs. Their main decision criterion is the price, given that competing goods are of an equal or at least similar quality. Since trade must be balanced, it is supposed that every single transaction, though performed independently, influences international trade as a whole. An adjustment mechanism must rebalance trade in case of imbalances – and even prevent trade balances a priori.

Theoretically, such an adjustment mechanism is necessary for the theory of comparative advantage.¹⁹ If the value of exports did not equal the value of imports there would be no reason why comparative production differences would be converted into real price differences and would determine international trade flows. The actual form of the adjustment mechanism is only of secondary interest. It can be the price-specie-flow mechanism, an adjustment via wages or via exchange rates. Important is the existence of such a mechanism. If trade were not balanced per se and no adjustment mechanism existed, there would be no reason why comparative advantage would be realised.

From a theoretical point of view, these adjustment mechanisms are problematic. The quantity theory of money, which Ricardo uses, assumes that money is neutral and neglects the velocity of a currency. However, neither is the velocity constant in practise nor is the quantity of money neutral to the real economy. Additionally, if money quantities change, interest rates are affected. If those effects are taken into consideration, there is no theoretical basis why changes should translate one-to-one into price level changes. Another fact, which is overseen by the price-specie-flow mechanism, is that inflation and deflation as a result of gold in- or outflows affect economies beyond mere price changes. A deflation means economic problems and distress for a state, its population and its businesses, that might be ruinous (Polanyi 2001, pp. 201-202). Empirically, the predicted dependence of price levels from the quantity of money cannot be proven (Stadermann 1996, pp. 78-79, 87-91). Though there is generally a positive correlation between the increase of the quantity of money and inflation (Hagen 2004), this correlation is not a 1:1 correlation, which the theory of comparative advantage not only suggests but also depends on.

The link between wage rates and the trade balance in a system with fixed exchange rates has similar theoretical problems and no empirical support. In comparing eleven nations Kaldor (1978) rather found an opposite link, namely that wage rates and export shares of a nation are positively correlated.²⁰ More recent examinations show mixed results (Reichel 2002, p. 333).

Likewise the adjustment mechanism via exchange rates in case of floating exchange rates has theoretical weaknesses. First, current accounts are not the sole determinant of exchange rates. The value of a currency is influenced by financial and currency markets on the basis of supply and demand (Harvey 1995). Supply and demand are in turn determined not only by trade factors but also by financial factors as well as rational and irrational expectations. Therefore, it must be recognised that exchange rates are mainly independent from trade imbalances.

But even if one allows for a moment that exchange rates are influenced by those imbalances, there are theoretical difficulties. According to this mechanism, a trade deficit of a nation leads to a depreciation of its currency. However, devaluation effects on the current account balance are ambiguous (Dornbusch 1995, p. 25). A devaluation leads to a fall in the demand of imported goods and a rise in the demand of exported

¹⁹ The barter assumption is not a necessary assumption for the theory of comparative advantage. However, it is hard to find any other justification why trade should be balanced all the time.

²⁰ This “‘perverse’ relationship between changes [...] in labour costs per unit of output and changes in export performance” (Kaldor 1978, p. 102) became known as ‘Kaldor paradox.’

goods because the former become pricier at home and the latter become cheaper abroad. However, the value of imported goods may increase, decrease or stay the same. The same is true for the value of exported goods. The overall effect for the trade balance is unknown in advance and depends on the price elasticity of supply and demand. Hence, even if the exchange rate reacted to trade imbalances as the theory predicts, these exchange rate changes could even increase trade imbalance.

Neoclassical economists have 'solved' this problem with the so-called Marshall-Lerner condition, which excludes cases in which devaluation does not lead to a reduction of a trade deficit.²¹ However, this only means that in order to sustain the adjustment mechanism via exchange rates, the theory departs further from reality since "it is widely acknowledged that there is no theoretical reason why a depreciation need have any particular effect on the trade balance" (Rose 1991, p. 301). Empirically, the Marshall-Lerner condition is not confirmed (Rose 1991).

To summarise, it exists rather a "remarkable relative inaction of trade balances with respect to exchange rate changes" (Brauer 2003, p. 12).²² Results of empirical studies do not indicate a general, unambiguous causal link between the exchange rate and the trade balance.²³

Unsurprisingly, balanced trade is only an exception in practise. Even strong defenders of the theory of comparative advantage like Krugman and Obstfeld have to admit that "in reality, a country's foreign trade is exactly balanced only rarely" (2009, p. 295). Internationally, trade imbalances that can be large and persistent are common (Milberg 2001, pp. 407-408).²⁴ Additionally, financial crises like the Asian crisis in the 1990s show "that balance of payment disequilibria are seldom benign and self-adjusting" (Felipe and Vernengo 2002, p. 71). It can be concluded that the "empirical evidence has been quite unsupportive of the comparative advantage hypothesis" (Shaikh and Antonopoulos 2013, p. 203).

The definition of international trade as barter trade is underlying the assumption of balanced trade. This, however, is not a useful simplification, but it leads necessarily to unrealistic analysis and predictions, mainly because it misrepresents the role of money, or rather is a "belittlement of money" (Dillard 1988, p. 306). A capitalistic world is not characterised by a barter economy but by a market economy. The main difference in the context of international trade is that "sales and purchases need no longer coincide. The seller does not necessarily have to buy at once" (Sardoni 1986, p. 422). Thus, money is not only a means of exchange. It is foremost a means of payment and is also used to store value, settle debts, transfer wealth and make extraordinary payments. Thus, contrary to the barter assumption of the theory of comparative advantage, money is not like any other commodity. It is rather of "practical importance [to possess] specifically money rather than any commodities at all" (Lapavistas 1996, p. 67). Moneymaking is the main purpose of every economic activity in a market economy. In the context of this article, it is especially important that "money as a store of value in a world of uncertainty does affect motives and decisions of wealth-holders and wealth-producers in a significant way" (Dillard 1988, p. 300). Therefore, nations can take an advantage if they have a trade surplus and thus accumulate capital domestically. Since money can be used as storage of wealth, it is obvious why a nation favours a trade surplus over balanced trade or a trade deficit. A trade surplus is generally seen as a characteristic of an economically successful nation (Pasinetti 1988, p. 140). A trade deficit on the other hand might mean that reserves are lost which worsen a nation's

²¹ A short version of the Marshall-Lerner condition is that it "indicates a stable foreign exchange market if the sum of the price elasticities of the demand for imports and the demand for exports, in absolute terms, is greater than 1" (Salvatore 2011, p. 563).

²² Even in cases where the Marshall-Lerner condition holds, exchange rate changes do not cause trade balances to react as the theory predicts (Brauer 2003, p. 12). There are empirical studies that support the Marshall-Lerner condition, but there are also studies that reject this condition. Therefore, there is no unambiguous empirical support for it, verifying the presumption that this condition may sometimes hold and sometimes not. But it cannot be inferred that the Marshall-Lerner condition should be used in theoretical models. For a list of empirical studies on the Marshall-Lerner condition see Shirvani and Wilbratte (1997). A more recent study that reinforces this ambiguous result can be found in Mahmud et al. (2004).

²³ For an overview of some empirical studies see Reichel (2002, pp. 328-29). A study of developing countries by Rose (1990) confirms these findings.

²⁴ Therefore, the term 'chronic' to describe a continuing trade deficits or surpluses is widespread. This label emphasises that there are no indicators which suggest that it is only a temporary phenomenon. Rather, chronic in this context is used "in the clinical sense of causality related to inherent systemic problems" (Preeg 2000, p. 2).

situation (Felipe and Vernengo 2002, p. 65).²⁵ It can be concluded that “the trade surplus country accrues liquid assets: there is no reason to assume these will be converted into non-liquid assets, much less into foreign-produced non-liquid assets. Saving is thus the mechanism which creates the possibility of [...] persistently unbalanced trade” (Milberg 2002, p. 242).

As was shown, there is neither a theoretical basis nor empirical support to assume balanced trade. This assumption is not a useful simplification but a distortion of the reality.²⁶ It ignores the influences of money and the (un)desirability of trade surpluses and deficits, which are important in the context of international trade.

By giving up this assumption, one would not only increase one’s understanding of international trade, but also have to drop the theory of comparative advantage. Without balanced trade and an adjustment mechanism in case of trade imbalances, there would be no transformation process which converts comparative production differences into absolute money price differences. Since trade imbalances are the norm and an adjustment mechanism neither exists in practise nor is it conclusive in theory, it has to be concluded that comparative advantages are not transformed to price differences and therefore, they cannot explain international trade flows.

Specialisation and gains from trade

The third assumption is that the gains that result from international trade are only static gains in the form of more goods being produced. Consumption is increased and the needs of the population are satisfied to a higher degree. This can be achieved because international trade leads to a more efficient use of the existing resources. Ricardo does not consider dynamic gains in his formulation of the theory of comparative advantage and he does not integrate growth into this theory. While Ricardo neglects technical progress as a result of trade, neoclassical models like the Heckscher-Ohlin model assume identical technology in all countries and thus exclude the possibility of technical change *ex ante*. In this model each nation is ‘naturally’ endowed with factors of production that are not affected by international trade, neither quantitatively nor qualitatively. Ohlin states that international trade only “mitigates the disadvantages of the unsuitable geographical distribution of the productive facilities” (1933, p. 42). As Bhagwati notes, neoclassical theory belongs “to the realm of ‘statics’” (1964, p. 4). An improvement in static efficiency of existing resources is the only benefit from international trade. These gains are merely once-and-for-all. New gains can only be achieved if trade is expanded since existing trade yields no further gains. Moreover, this allocation of resources can completely be reversed in case that international trade ceases or a state cuts its trade links. A nation can simply re-allocate its resource to the state that existed in autarky and easily return to the production level that it had before it entered into trade.

The theory of comparative advantage has never incorporated dynamic gains that lead to technical change and productivity growth which are not exogenously given but which are endogenous, i.e. the result of trade. Moreover, it is difficult to coalesce both, the theory of comparative advantage and endogenous development variables, because the former depends on static comparisons and predictable results. This is not changed by the so-called “dynamic comparative advantage”. In those models comparative advantages develop and change over time. This change, however, is not a result of trade itself but of a change in exogenous factors. These exogenous changes can come from population growth, industrial policies, the rate of capital accumulation (propensity to save) and technological inventions among others. However, the dynamics of these models originate from outside the realm of trade. They constitute models in which comparative advantages are influenced by exogenous changes rather than endogenous dynamic models of comparative advantage.

The underlying foundation behind these static models is what Buchanan and Yoon (2002) call

²⁵ However, a trade deficit is not necessarily bad for a nation. It “may be welcomed if it is due to a high rate of investment at home, which is developing resources that will yield a surplus of exports in the future to repay the debt. But a deficit that is due merely to competitive weakness is highly unfavourable” (Robinson 1977, pp. 1334-35).

²⁶ Stein argues in regard to neoclassical exchange rate theories: “Although most scholars are aware of the deficiencies of these models, the profession continues to use them wholly or partly because they do not have a logically satisfactory substitute” (Stein 1997, p. 228).

“Ricardian logic of trade” which is implied in the theory of comparative advantage. It is supposed that “specialization and subsequent trade become advantageous because of the inherent differences among potential trading parties” (Buchanan and Yoon 2002, p. 400). These differences between nations are not influenced by trade but remain constant after trade started. Hence, the source of comparative advantage is exogenously given, be it productivity differences (Ricardo), different endowments (Heckscher-Ohlin model) or something else. Trade “will occur and will be beneficial whenever countries’ relative prices would be different without trade” (Kenen 2000, p. 37).

In reality, the world and especially the industrialised nations are characterised by enormous technical growth that led to a huge increase in the standard of living and the wealth of the industrialised world. Dynamic gains are more important than mere static gains that arise from effective allocation of given resources. Skarstein calculates that the increase in production in Ricardo’s England-Portugal example amounts to 10% in wine production and 6.25% in the production of cloth. “Nothing more happens” (2007, p. 352).²⁷ This, however, is already an optimistic calculation since it assumes that both nations specialise fully and that both nations started with exactly the same output, which is not stated by Ricardo. Compared to the growth rates of developed nations in the last decades, this “once-and-for-all effect of specialisation under free trade is quite insignificant” (Skarstein 2005, p. 358). Additionally, states cannot easily return to autarky as the statement that these static gains are reversible suggests. Such a move would be costly for a nation and its economy because international trade also produces dependencies.

Since technological change and productivity growth are an important economic factor, there is no logical reason to disregard or even exclude them *ex ante* in a theory of international trade. Neither is there any reason for regarding dynamic changes only as exogenous to trade. Rather they should play a role in theory that corresponds to their significance in the real world. The Ricardian logic of trade risks confusing cause and effect. Nations differ, but trade and specialisation lead to even more differences which enhances trade further. Additionally, specialisation leads to productivity growth due to economies of scale that can be exploited and mechanisations. To assume that differences are exogenously given misses the dynamic developments that result from trade. In Ricardo’s example, productivity differences remain the same between nations after they specialised. This, however, is not very realistic. The neoclassical formulation assumes that factors of production are exogenously given. The factor endowment of a nation is even referred to as natural, which suggests that trade flows are determined by “nature” (Milberg 2001, p. 414). In reality these ‘endowments’ are not natural and change in consequence of trade. Labour and land can be influenced by education and fertiliser, for example. Capital, on the other hand, can hardly be seen as an endowment at all because it is nearly always produced (Steedman 1991, pp. 3-6; Subasat 2003, pp. 156-60).

A theory of international trade should include technical progress and dynamic gains that are endogenous to trade, because these gains are much more significant than any static gains (see also Steedman 1991; Williams 1929). They should even be a central issue. By ignoring or excluding them, the theory of comparative advantage disregards questions of central importance.

Full employment of capital and labour

The fourth assumption that is indispensable to the theory of comparative advantage is full employment of both labour and capital. Neoclassical models generally use this assumption. It is necessary for the concept of opportunity costs. If unemployment (or underutilised resources) exists, there are no opportunity costs, because the production of one good can be increased without decreasing the production of the other good. In this case relative costs of a commodity would stay undefined because the commodity could “be produced at no social cost” (Prasch 1996, p. 42). Since comparative advantages are determined by opportunity costs in the neoclassical formulation, these could not be calculated and this formulation would lose its logical basis. Ricardo and later classical economists assume that labour has a tendency towards full employment and that capital is always fully employed in a liberalised economy, because no capital owner will leave his or

²⁷ He comes to this result by arguing that England can produce an additional $\frac{1}{5}$ of its original output of cloth and therefore $\frac{1}{10}$ more than the overall original output of cloth with the 20 workers that England saves as a result of trade. The overall amount of produced wine would rise by 6.25 % correspondingly.

her capital idle but will always be trying to earn a profit from it. That there is no limit to the employment of capital is a consequence of Say's law which presumes that production is only constraint by resources and which is also adopted by neoclassical economists.

From a theoretical point of view, the theory of comparative advantage has to assume that either labour or capital is used at full capacity and resources constrain the production. There are two reasons, the realisation of gains from international trade and the adjustment mechanism. The theory of comparative advantage assumes static gains in form of a more effective resource allocation which can be seen as a consequence of the resource constraint approach. This cannot be reached unless employment of resources has the highest possible level domestically (Felipe and Vernengo 2002, pp. 54-55). If a nation's resources would not be fully employed, production and consumption could be increased domestically without participating in international trade. The whole rationale for the existence of international trade would vanish as well as the possible gains. In this case, a state could even gain more by abstaining from international trade and boosting domestic production because more labour and capital would then be employed and the national income would be increased. Furthermore, if unemployment is theoretically possible, it will also be possibly that international trade leads to job losses. In the case of job losses gains could not be unambiguously specified, because job losses might outweigh the gains (Shaikh 2007, p. 52).

Full employment (of labour) is also a necessary condition for the adjustment mechanism. If changing unemployment levels are allowed for, income can alter. Once income and thus demand can alter, the current account balance will rather be influenced by them than by price level or exchange rate changes. Demand effects are neither included in the quantity theory of money nor in the exchange rate adjustment approach.²⁸ Turnell concludes that "with unemployment allowed to exist in the model, the effect of the initial trade imbalance of the higher cost country is not to bring about price changes, but changes in income (employment) and/or real interest rates" (2001, p. 7). Thus, any adjustment mechanism that underlies the theory of comparative advantage no longer operates if unemployment exists (see also Çağatay 1994; Milberg 2002).²⁹

Theoretically, this assumption is problematic. Once it is allowed that money can also be used as storage of wealth (and not just as a means of exchange) one has to conclude that there is no tendency towards full employment of capital and of labour. The possibility of saving "creates the possibility of [...] underemployment" (Milberg 2002, p. 242). Hence, there is no theoretical justification for this assumption.

In practise, the "world is characterized by unemployment" (Felipe and Vernengo 2002, p. 54). Un- and underemployment of capital and labour is not a short run phenomenon but it is common and widespread. In the last decade between 175 and 200 million workers have been unemployed worldwide (ILO 2012). If underemployment is added, this figure rises to a much higher number. Even in the fifteen most economically liberalised nations, unemployment rates have ranged between 1.0% and 16.6% in the last two decades.³⁰ Similar, a nation has usually "productive capacity for more output than it can sell" (Robinson 1973, p. 15). It has to be concluded that unemployment and idle resources are rather the rule than the exception.

The assumption of full employment is, as was shown above, crucial to the theory of comparative advantage. Without this assumption, the supposed gains from international trade, namely a higher amount of available products that the population can consume, can be achieved without engaging in international trade. This means, that the explanation of the theory of comparative advantage why international trade takes place is itself invalid if unemployment to exist. Though it might be reasonable to use this assumption in other

²⁸ The reason is that international trade merely leads to a change in the composition of the production according to the theory of comparative advantage. National employment and income levels have the same level with and without trade in all nations (Turnell 2001, p. 8).

²⁹ It might be added that, strictly speaking, the realisation of gains and the adjustment mechanism are not dependent on full employment but on the assumption of a constant rate of unemployment is sufficient. However, once the possibility of unemployment is included it can hardly be argued, from a theoretical point of view, that the unemployment level will be constant at five per cent or twenty per cent. Rather, it must be assumed that the level changes.

³⁰ These nations include Australia, Canada, Chile, Denmark, Finland, Germany, Hong Kong, Ireland, Luxembourg, the Netherlands, New Zealand, Singapore, Switzerland, the UK and the United States. They were the fifteen most liberalised nations on average between 1990 and 2009 according to Economic Freedom of the World Report (Gwartney et al. 2011). The unemployment data is taken from IMF (2011).

economic models, it is inappropriate for the theory of comparative advantage because the whole motive of international trade collapses if this unrealistic assumption is given up.

International harmony

The fifth assumption is less an assumption in itself but a consequence of the other four assumptions. The theory of comparative advantage depicts international trade as a harmonious exchange. By definition, every nation must have a comparative advantage in the production of certain goods. Since these comparative production advantages are transformed through an adjustment mechanism into absolute price advantages, each nation can sell some goods, or at least one good, cheaper than all other nations and can thus “successfully compete in world markets, regardless of the degree of efficiency of its technology or resource-base” (Jones 1980, p. 235). There is no need for nations to focus on their competitiveness. Even a nation that lacks in productivity and is technologically backward is still competitive in the world market and can balance its imports and exports. As a consequence “international trade is not about competition, it is about mutually beneficial exchange” (Krugman 1997, p. 120).

In this way, international trade is described as an even-handed international division of labour. A “homeostatic view” prevails, in which a “natural pattern of specialization and trade” exists. In case of any deviation from this ‘natural’ order, “automatic forces tend to restore this natural pattern” (Krugman 1987, p. 41). In this idyllic picture, every nation produces those goods that it is able to produce comparatively best. Domestically, entrepreneurs as well as regions compete with each other, which leads to winners and losers. In contrast, international trade leads to “the happy result that all countries will be able successfully to participate in international trade in the sense that they will benefit from such trade and be able to generate export revenues equal to the value of imports” (Milberg 2004, pp. 56-57).

Underlying this view of international trade is the assumption that trade is always balanced which is the result of equating international trade with barter trade. Balanced trade and an adjustment mechanism lead to an equalisation in competitiveness among nations. Consequently, Ricardo assumes that both nations gain from the productivity growth in one nation because such an improvement “raises general prices in the country where the improvement takes place” (Ricardo 2004b, p. 141). According to the neoclassical formulation, productivity growth in one nation leads to an appreciation of its currency. Its higher productivity is balanced by a disadvantageous movement of the exchange rate. Nations are made, without any policy or other interference, equally competitive by exchange rate movements – independent of their technology, their resources, their workforce and their level of development. Free trade is beneficial from both a global and a national point of view. In this static analysis, all nations win. Moreover, the factor price equalisation theorem even postulates that differences in real wages are reduced and are finally eliminated. Differences in real earnings per head in all free trading nations will be reduced or even vanish. Therefore, neoclassical economists argue that poor nations have the opportunity to develop and catch up with developed nations. The wage level in poor nations would conform to the wage level of rich nations. Free trade alone has “the potential for development and convergence between rich and poor countries” (Kiely 2007, p. 15). Free trade is thus a great equaliser.

The world according to the theory of comparative advantage can be described by paraphrasing Karl Marx (1922, p. 31): from each nation according to its faculties, to each nation according to its needs!³¹ What Keynes states about mainstream economics in general, is certainly true in respect to the theory of comparative advantage: it “represents the way in which we should like our economy to behave. But to assume that it actually does so is to assume our difficulties away” (1936, p. 34). Obviously, this harmonic view does not reflect the real world. In a world that is dominated by market economies, companies compete internationally as well as nationally. Though I am dealing with international trade and the emphasis is on nations, it should not be forgotten that companies and not nations sell goods. Both do not build a unified subject when it comes to international trade. A nation has other aims than a firm. Ricardo is concerned with the distribution of income between the different classes. However, in the case of international trade he

³¹ Marx uses the original phrase to describe the “higher phase of communism” and not a market economy.

assumes that the interests of merchants and of consumers do not contradict with the interests of their nations. Neoclassical theory neglects different particular interests and is only concerned with the nation as a whole.

Companies export and import not for the benefit of their nations of origin but for the sake of their own profit. However, competition always means a rivalry between companies which can increase their own profits and their market shares by beating their rivals and squeezing them out of the market.³² Profit making and not consumption, as suggested by the barter assumption, is the motive of production in a market economy. If a firm can increase its profit by producing fewer goods, it will do so because of its pecuniary incentives. "The firm is dealing throughout in terms of sums of money. It has no object in the world except to end up with more money than it started with. That is the essential characteristic of an entrepreneur economy" (Keynes 1979, p. 89). The success of a company is measured by their profits and their capital accumulation.

Nations on the other hand also compete with each other, but in a different way than companies. This, however, is disguised by the theory of comparative advantage. Once its assumptions are rejected, one can also gain an insight into the competition between nations. If production factors are allowed to move internationally, nations will compete for capital (investments) and talent (highly-educated workers). If trade imbalances and unemployment are considered, a trade surplus becomes favourable for a nation, because it generally means competitive success, a higher level of production, a lower level of unemployment and an inflow of money, which can be invested as capital or stored as wealth. Successful export industries provide for employment and profits. Success in international competition is in the economic interest of the state (or to be more precise its leaders), because the mentioned effects lead to increases in the state revenue – either because the potential tax basis is increased or the welfare expenditure can be cut without decreasing the economic potential of the society. All this has consequences beyond the economic sphere, because nations also compete for power, such as political influence, military and bargaining power, which are all influenced by their economic success (Dunn 1994).

Contrary to the claims of the theory of comparative advantage that national competitiveness is always evened out, success in economic competition leads to further success, while failure often brings about more failure. Kaldor calls this phenomenon "polarisation process". This effect "is nothing else than the inhibiting effect of superior competitive power of industrially more efficient and dynamic countries, as compared to others" (Kaldor 1981, p. 597).³³ Therefore, some nations benefit more from free trade while others benefit less or might even suffer losses depending on their level of development. Kaldor concludes that "under more realistic assumptions unrestricted trade is likely to lead to a loss of welfare to particular regions or countries" (Kaldor 1981, p. 593). It is not surprising that a growing market share of a nation is "strongly positively correlated" with faster productivity growth and an increase in technological capability (Fagerberg 1996, pp. 40-41). Furthermore, the productivity and success of a production factor is not independent of other production factors, but not in the neoclassical sense of substitutability. Rather, production factors ordinarily complement each other. A lack of capital leads to higher unemployment, while more capital generally leads to increasing employment levels. A relative scarcity of capital does not lead to a competitive advantage in labour intensive goods, as the theory of comparative advantage states.

Additionally, the theory of comparative advantage assumes, in accordance with this harmonic view, that it does not matter in which goods a nation specialises. A nation benefits equally whether it specialises "in apples or Apple computers" (Çağatay 1994, p. 241). However, contrary to this assumption, in reality it has different consequences for a nation if it specialises in agriculture or in industry. Industrial nations are usually richer and economically more developed than agrarian nations. Theoretically, this conclusion is supported by Verdoorn's and Kaldor's growth laws which have wide empirical support. These three laws state that there are strong positive correlations (a) between economic growth and growth of the

³² Competition should not be understood in the neoclassical sense of perfect competition that likewise suggests a harmonic world. Rather, as Morgenstern points out, the meaning of competition "is one of struggle with others, of fight, of attempting to get ahead, or at least to hold one's place" (Morgenstern 1972, p. 1164). The neoclassical term 'free' or 'perfect' competition is thus "a complete misnomer" (Morgenstern 1972, p. 1171).

³³ This effect takes place internationally as well as domestically: "free trade is as much a mechanism for the concentration and centralization of international capital as free exchange within a capitalist nation is for the concentration and centralization of domestic capital" (Shaikh 1980, p. 227).

manufacturing sector (Kaldor 1967); (b) “between the growth of labour productivity and the volume of industrial production” (Verdoorn 2002, p. 28); (c) between growth of manufacturing and growth of the productivity outside manufacturing. Additionally, the terms of trade between agricultural goods and manufactured goods decline over time to the detriment of the former (Larrinoa Arcal and Maetz 2000).

5. Implication for International Trade Policy

As was shown, the theory of comparative advantage is an inadequate theory for the explanation and understanding of international trade because of its insufficient and deceptive assumptions. However, the most crucial consequences of a theory do not arise from theoretical inadequacy but from its utilisation in practical policies. If economic policies are based on a deficient theory, they can become harmful and lead to unintended consequences. That economic theories have huge impact on political decision-makers is unquestionable. As Keynes notes at the end of his *General Theory*, “the ideas of economists and political philosophers, both when they are right and when they are wrong, are more powerful than is commonly understood [...] soon or late, it is ideas, not vested interests, which are dangerous for good or evil” (1936, pp. 383-84). This is especially true for simple theories that have clear-cut predictions. They can easily be absorbed by policymakers and others outside the theory’s subject area. For policymakers, it is easy to refer to and rely on simplistic theories because these theories help to make one’s point and to convey and justify policy measure. More complex theories, which do not offer such unambiguous conclusions about a policy outcome, are less suitable thereto. This means that the danger of deficient theories is not only its theoretical falsity but also, and even more importantly, that it is used as the theoretical basis to solve policy issue.

It is not surprising, considering its widespread support, that the theory of comparative advantage was and still is influential in shaping international trade policies. International trade liberalisations, which comprise mainly the removal of trade barriers and which are pursued by the WTO, the IMF and the World Bank, are strongly influenced by it (Shaikh 2007; Shell 1996). It is argued that trade liberalisation is the best way in which “countries can benefit from comparative advantage-driven trade” (Kowalski 2011, p. 5). The WTO frequently refers to the comparative advantages as the theoretical justification to its commitment to free trade and to its attempt to achieve this objective. On its homepage the WTO bases “the case for open trade” on the theory of comparative advantage. It appraises this theory as “arguably the single most powerful insight into economics” (WTO 2013). Paul Lamy, the Director-General of the WTO, defended the theory of comparative advantage in a recent speech against criticism (Lamy 2010).

In contrast to the focus of WTO policies on trade liberalisation, the objectives of the WTO, which are stated in the preamble of its founding agreement (Marrakesh Agreement), include “raising standards of living, ensuring full employment and a large and steadily growing volume of real income and effective demand, and expanding the production of and trade in goods and services” (WTO 1994). However, the WTO is mainly concerned with free trade and reduction of trade barriers and less with the achievement of its other objectives (Ismail 2005; Rodrik 2001). This can be explained by the reliance on the theory of comparative advantage, which leads to the conclusion that the other aims, most notably national welfare, can be best achieved if trade is liberalised and protectionists policies are abolished. This means that other policy measures can be disregarded. In this way, free international trade becomes an end in itself and is not merely a mean to achieve other objectives. The other aims of the WTO are perceived only in the aftermath and as a result of trade (Rodrik 2001). Its recommendation and demands emphasise measures to reduce unrestricted trade such as abolishing tariffs and nontariff barriers and the elimination of subsidies (Shaikh 2007, p. 61).³⁴

As discussed above, the theory of comparative advantage neglects important issues of international trade. It is therefore not surprising that policies that rely on this theory also disregard these issues. Empirical studies do not support the predicted link of trade liberalisation and increasing living standards. Rodrik, for example, evaluates empirical studies and concludes “that there is no convincing evidence that trade liberalization is predictably associated with subsequent economic growth” (2001, p. 11). There are many countries that followed the recommendations of the WTO and liberalised their trade and that suffered as a

³⁴ An example of the neglect of its other objectives, which are stated in the preamble of the Marrakesh Agreement, is given by the Dispute Settlement Body of the WTO, which does not consider these objectives in its rulings over disputes on trade restrictions.

consequence of this policy. On the other hand, there are nations that had used protectionist trade policies to become successful in international markets (Shaikh 2007). This is not surprising considering the analyses above. One issue that is especially important in the ongoing and future trade policies is the assumption of the theory of comparative advantage, that trade compensates for international differences and is a great equaliser. It is assumed that free trade levels the playing field. This is especially crucial with regard to poor developing nations. It is uniformly argued, both by economists and politicians, that these nations possess a comparative advantage in agricultural goods and that they should therefore specialise in agricultural production. However, this disregards major ramifications and will misstate the opportunities of such a specialisation. As was shown above, it does matter whether a nation specialises in agriculture or manufacturing. Nations that specialise in agriculture have a lower growth rate. As Skarstein points out, “the industrial sector is the dynamic centre of technical change and productivity growth” (2007, p. 353) in any economy. This means that nations that specialise in agriculture will fall ever further behind industrial nations. This development is even amplified if a nation deindustrialises as a result of its specialisation in agriculture. Additionally, nations that export mainly agricultural goods are faced with tendency of declining terms of trade between agricultural goods and manufactured goods. This leads to trade deficits, which will not be balanced out automatically as the theory of comparative advantage suggests, but rather disadvantages these nations even further and leads to an accumulation of debts. Moreover, the fact that and the way in which nations compete with each other, as described above, is completely neglected. These negative developments of specialisation are not regarded by the theory of comparative advantage and trade policies that are derived from this theory risk to disregard them and to draw the wrong conclusions. If poor developing nations specialise in agriculture it might have some positive effects but the negative effects have to be taken into consideration, at least to be able to mitigate them. To get a better understanding of international trade and its ramifications neither economists nor politicians should rely on a misleading theory as the theory of comparative advantage.

6. Conclusion

After scrutinising the essential assumptions, on which the theory of comparative advantage is based – regardless of its specific formulation – it has to be concluded that these assumptions are inadequate and can be rejected on theoretical, logical and empirical grounds. Economic models are always a simplification from the real world and an abstraction from empirical phenomena. However, the assumptions made by the theory of comparative advantage are not valid and justifiable simplifications. Rather, this theory reproduces international trade in a way that is theoretically objectionable, contradicts empirical analysis and falsifies the reality.

The abandonment of the first two assumptions, international immobility of capital and labour and the existence of an adjustment mechanism that leads to balanced trade, leads to the conclusion that the presumption of an automatic transformation from comparative production advantages into absolute price advantages is untenable. Therefore, comparative advantages cannot determine international trade patterns. The abandonment of the third and fourth assumption, the static nature of the gains from trade and full employment, makes the claim invalid that free trade is necessarily beneficial. Additionally, the reason or motive for international trade, which consists of the benefits, is made obsolete. This questions the whole rationale behind the theory of comparative advantage. The scrutiny of the fifth assumption, harmony, emphasises the irrelevance of the theory of comparative advantage in respect to trade between capitalistic nations. This theory glorifies and misrepresents trade between market economies rather than describes it realistically.

To summarise, it has been shown that the theory of comparative advantage is not a useful and adequate theory that explains the patterns of and the underlying reasons behind free international trade. The ‘gains’ from its assumptions are predictability and simplicity. However, the ‘costs’ of these gains are too high for any theory, which consist of the irrelevance for the explanation of international trade. Free international trade between market economies does not take place as the theory of comparative advantage suggests. Therefore, this theory should be abandoned in favour of a theory that is logically and theoretically sound and

presents a justifiable simplification of reality. Such a theory would also take into consideration the relevant phenomena and problems that are connected to free international trade but disregarded by the theory of comparative advantage. Additionally, policies that rely on this theory are at least questionable and risk drawing wrong conclusion. This is emphasised by the scrutiny of the argument that poor developing nations should specialise in agriculture, which is a commonly brought forward and is also used in the WTO trade talks. This scrutiny shows that trade policies based on the theory of comparative advantage misstate the effects and implications of trade liberalisations.

Despite its theoretical and empirical problems and misassumptions, the theory of comparative advantage enjoys still a widespread acceptance in mainstream economics. It is “one of the least controversial ideas in economics” (The Economist 2011, p. 5). When difficulties arise, there are three ways of response. First, empirical difficulties are rejected on the grounds that states intervene and hinder trade to be free. The theory is defended and inconsistencies with the real world are blamed on political interferences. Second, theoretical as well as empirical difficulties are explained by short run phenomena that do not affect the long run predictions of the theory of comparative advantage. Third, economists complement it by modifying its assumption and formulate exemptions – as is done for example by the New Trade Theory.

All three responses, however, are deficient. Political intervention exists in the real world but that would not invalidate the theory of comparative advantage. Trade barriers such as tariffs can be added to the production costs and thus change comparative advantages of nations. The theory itself, however, would still hold in the face of those interventions. This was already recognised by Ricardo who argued that taxes hinder the most efficient use of the factors of production worldwide but do not render the theory of comparative advantage obsolete (Ricardo 2004b, p. 172). The second argument, that the theory of comparative advantage explains only long run developments but short run phenomena might contradict its predictions, is not convincing once it becomes clear that long run might mean seventy-five year or longer (Froot and Rogoff 1995, p. 1657). In such a period, international trade patterns will change significantly and allegedly long-term trends are all but insignificant. In this way, the theory itself reveals its irrelevance in explaining anything that matters in international trade. The modification or exemptions like economies of scale and ‘imperfect’ competition that complement the theory of comparative advantage where its shortcomings are obvious, amplifies this irrelevance.³⁵ International trade theory, by being based on the theory of comparative advantage, runs the risk of ignoring everything that is important in determining trade patterns. What Joan Robinson concluded nearly forty years ago is still true today, namely that “there is no branch of economics in which there is a wider gap between orthodox doctrine and actual problems than in the theory of international trade” (Robinson 1973, p. 14).

This article does not give judgement in favour or against free international trade – and it has no such intentions. Free trade as a phenomenon is not the object of study. Rather, the dominating theory that tries to explain this phenomenon, and on which present implementation of trade liberalising theories is based, is the object of critique. After deconstructing the theory of comparative advantage and its assumptions, it cannot be endorsed any longer. Not only were the assumptions dismissed in this article, but it was also shown that the theory of comparative advantage is wrong on its own terms. The obvious suggestion is to dismiss the theory of comparative advantage after nearly 200 years in order to get a better and sounder understanding of international trade.

³⁵ Additionally, the appearance of those exceptions like increasing returns contests rather than enhances the theory of comparative, because, according to it, every transaction influences international trade. An unproblematic coexistence of comparative and noncomparative advantage trade is theoretically more than questionable.

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