

# Ricardo's Discovery of Comparative Advantage Revisited: A Critique of Ruffin's Account

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## 1. Introduction

In an influential paper, entitled “David Ricardo’s Discovery of Comparative Advantage”, Roy J. Ruffin (2002) has attempted to reconstruct the circumstances of Ricardo’s discovery of the law of comparative advantage and the thought processes that this involved. From textual, contextual and circumstantial evidence, and in particular from statements of Ricardo in three letters to Malthus and James Mill, he inferred that Ricardo ‘probably discovered the law of comparative advantage around the first two weeks of October 1816. The date itself is not important, but his letters at the time reveal how Ricardo’s mind worked when he discovered the law. If my hypothesis is correct, the letters show that his mind ranged over much of the terrain of trade theory – from factor price equalization conditions to the Ricardian model’ (2002: 727).

The present paper critically examines Ruffin’s account and argues that his interpretation is not convincing. His hypothesis regarding the dating of the discovery is based on a reading of some statements in Ricardo’s correspondence isolated from their respective contexts. When the context is taken into account, and the premises and implications of Ruffin’s hypothesis, according to which those statements refer to international prices and international trade are scrutinized, his interpretation proves to be questionable. The paper also shows that the

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analytical tools and concepts used by Ruffin to analyze Ricardo's text are inadequate to capture the development of his thinking on international trade.

It must be stressed, however, that Ruffin's paper has great merit in clarifying the true meaning of the "four magic numbers" in Ricardo's famous numerical example of England and Portugal trading wine and cloth with each other. As Ruffin correctly pointed out, Ricardo's four numbers refer to the amounts of labour embodied in the unspecified quantities of goods actually traded between the two countries – and not to unit labour requirements, as is still widely asserted. The same reading of Ricardo's four numbers had already been suggested by Piero Sraffa in his little-known article "An alleged correction of Ricardo" (1930),<sup>1</sup> but Sraffa's hint has apparently been overlooked for several decades by almost all scholars of Ricardo's theory of international trade.<sup>2</sup> Ruffin deserves credit for having clearly spelt out this feature of Ricardo's example and for having drawn attention to some of the implications which follow from it.

In his numerical example Ricardo starts out from a situation of balanced trade, so that the (commodity) terms of trade are effectively treated as given. This implies, as Ruffin (2002: 741, note 15) rightly pointed out, that the charge of logical incompleteness in Ricardo's exposition of the law of comparative advantage, first raised by Chipman (1965: 479) and since then shared widely among modern interpreters, is not justified. Some further implications that follow from the correct reading of Ricardo's numerical example were spelt out by Maneschi (2004, 2008, 2015), who has shown that Ricardo could correctly determine the gains which each country reaps from trade by simply subtracting two of the four numbers from the other two,<sup>3</sup> and that non-constant returns in the production of the traded commodities and incomplete specialization are compatible with Ricardo's exposition.<sup>4</sup>

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<sup>1</sup> In his 1930 paper, Sraffa corrected Einaudi's account, according to which Ricardo's exposition of the law of comparative advantage contained an error in the attribution of the gains from trade (see Einaudi 1929).

<sup>2</sup> See, however, Parrinello (1988) for an exposition of Ricardo's theory of comparative advantage in which the numbers are not interpreted as unit labour requirements, and constant returns to scale are not assumed. Interestingly, Schumpeter (1954: 607) also noted that the numbers refer to the amounts of labour embodied in unspecified quantities of commodities, but failed to see that these are the quantities actually traded, so that the terms of trade are not indeterminate, but given.

<sup>3</sup> As Maneschi (2015: 483) has pointed out, Sraffa had indeed formulated the concept and quantified the magnitude of these gains well before Ruffin and himself, when he observed:

Unfortunately, however, Ruffin's paper also contains several misconceptions that derive from his reading of Ricardo's texts on the basis of the so-called "Ricardian trade model" and, more generally, through the lenses of a modern neoclassical trade theorist. He not only assumes, like many modern trade theorists, that Ricardo's exposition of comparative advantage presupposes a "one-factor model",<sup>5</sup> but he also means to have discerned elements of the "factor price equalization theorem", the "Stolper-Samuelson theorem", and the "Lerner symmetry theorem" in Ricardo's texts (2002: 737, 739, 744). The present paper therefore not only examines Ruffin's proposed reconstruction of the "discovery process" by which Ricardo arrived at the comparative advantage principle, but also tries to clarify the analytical differences between Ricardo's classical approach to international trade theory and the now dominant neoclassical approach that has informed Ruffin's interpretation.

The structure of the paper is the following. In Section 2, it is shown that Ruffin's reconstruction of the thought processes involved in Ricardo's discovery of comparative advantage is based on the modern re-statement of Ricardo's trade theory in terms of a "one-factor" model. I shall argue that this model is an inappropriate basis for an attempt to reconstruct Ricardo's discovery of the comparative advantage theory, because it neglects that Ricardo had envisioned relative prices, and in particular international prices, as being dependent on the (country-specific) distribution of income between wages, profits, and rents. In Section 3, I then show that Ruffin's novel interpretation of the relevant passages in Ricardo's three letters of October 1816 is contradicted by textual evidence. Section 4 summarizes the argument.

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'England gives the cloth produced by 100 Englishmen in exchange for the wine produced by 80 Portuguese; and since this quantity could only have been produced by 120 Englishmen, she gains the labour of 20 Englishmen. Portugal gives the wine produced by 80 Portuguese for the cloth produced by 100 Englishmen; the production of this cloth would have required the labour of 90 Portuguese, and therefore Portugal gains the labour of 10 Portuguese.' (1930: 541)

<sup>4</sup> Ruffin's 2002 paper has led to a number of further contributions, in which Ricardo's contribution to international trade theory has been re-examined, including Aldrich (2004), Ruffin (2005), Maneschi (2004, 2008), and Morales-Meoqui (2011).

<sup>5</sup> In modern textbooks the representation of the so-called "Ricardian" trade model in terms of a "one-factor" model, which was first proposed by Haberler (1930), is often used to emphasize the contrast with "Heckscher-Ohlin" models, in which comparative advantages derive from international differences in the countries' relative endowments *with several factors*.

## 2. The “modern statement” of the law of comparative advantage and its role in Ruffin’s reconstruction

In his reconstruction of Ricardo’s discovery of the law of comparative advantage Ruffin invokes a mixed set of arguments, combining novel textual interpretations, circumstantial evidence, and logical implications that are supposed to follow from Ricardo’s exposition of the law. In the following, I first concentrate on the shortcomings of the “Ricardian” trade model, which Ruffin set out in the first substantial section of his paper (2002: 729-31), for a proper reconstruction of Ricardo’s theory of international trade.

### 2.1 The “modern statement” of Ricardo’s law of comparative advantage

Ruffin’s paper opens with a “modern statement” of the law of comparative advantage,<sup>6</sup> which he then employs to show that Ricardo’s own exposition was quite different. In this context, Ruffin argues convincingly that their reliance on such a modern version has misled ‘leading modern interpreters into unjustified claims of logical incompleteness’ in Ricardo’s argument (2002: 729). But his ‘rational reconstruction’ of Ricardo’s foreign trade theory in terms of a “one-factor” model has also led Ruffin into questionable interpretations of various passages in Ricardo’s letters and writings, as well as into giving undue weight to the labour theory of value.

For my present purpose, it suffices to provide a brief sketch of the model and to draw attention to only some of its features. Consider, then, two countries, home and foreign, that produce two goods, 1 and 2. Each unit of good  $i$  ( $i = 1,2$ ) requires  $a_i$  ( $a_i^*$ ) units of homogenous labour in the home (foreign) country. There is no capital (and thus also no capitalists and no profits) in the model. Labour can move freely between industries but not between countries. Therefore, wage rates  $w$  and  $w^*$  are uniform across industries within each country but not across countries. Assume that  $a_i < a_i^*$  and  $a_1/a_2 < a_1^*/a_2^*$ . Then relative prices in autarky are proportional to relative labour contents (and equal to relative wage costs), and commodity 1 is relatively cheaper in the home country. When a world market is

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<sup>6</sup> Ruffin’s “modern statement” is essentially identical with expositions of the so-called “Ricardian model” in standard modern textbooks on international trade theory, such as Krugman/Obstfeld/Melitz (2014: Chap. 3), the basic elements and analytical features of which derive from Haberler (1930).

established, prices must be the same everywhere (ignoring transport costs), both countries are completely specialized, and the international price ratio must lie in the range

$$\frac{a_1}{a_2} \leq \frac{p_1}{p_2} \leq \frac{a_1^*}{a_2^*}$$

Because of  $p_1 = wa_1$  and  $p_2 = w^*a_2^*$ , this inequality can be rewritten as

$$\frac{a_2^*}{a_2} \leq \frac{w}{w^*} \leq \frac{a_1}{a_1^*}$$

In his exposition of the model Ruffin draws attention to the fact that the ratio of with-trade prices ‘is affected by relative wage rates between two types of labour, home and foreign’ (2002: 730). He then wonders – apparently forgetting that this “result” was not expounded by Ricardo in the chapter “On foreign trade”, but has been derived from his own rational reconstruction of the latter’s argument in terms of a “one-factor” model – why Ricardo ‘did not apply this result in chapter 1 of his *Principles* ..., in which he dealt with the question of different types of labor’ (2002: 730). And some ten pages further down Ruffin then presents the fact that Ricardo did not apply this “result” in the chapter “On Value” as circumstantial evidence that supports his hypothesis that ‘the problem he [Ricardo] was working on [in the first two weeks of October 1816] almost surely was comparative advantage. The most reasonable assumption is that when he wrote chapter 1 he had not worked out the law of comparative advantage because of his statement about relative prices and relative wages’ (2002: 740). This argument, however, is unconvincing.

Firstly, it is not true that Ricardo had not acknowledged, in chapter 1 of the *Principles*, that relative prices are affected by relative wages for different types of labour. In section 2 of chapter 1 of the *Principles* (I: 20-22) Ricardo had not suggested that relative prices are unaffected by the existence of wage differentials for different types of labour, but rather that those wage differentials *remain fairly stable over time* and therefore are ‘no cause of variation in the relative value of commodities’ (I: 20, emphasis added).<sup>7</sup> Ruffin’s hypothesis that Ricardo had been unaware of the impact of relative wages on relative prices when he wrote chapter 1, and only learned of this “result” when working on chapter 7, is not correct.

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<sup>7</sup> For an analytical treatment of persistent wage differentials in a classical framework and a summary account of Ricardo’s (and Smith’s and Marx’s) treatment of heterogeneous labour, see Kurz and Salvadori (1995, chap. 11).

Secondly, and more importantly, Ricardo's exposition of the law of comparative advantage was not based on a "one-factor" model. His concern in chapter 7 was with *international profit rate differentials* – not with wage differentials (textual evidence for this claim is provided below, in Section 2.2.) Accordingly, a proper reconstruction of the modelling assumptions underlying his argument in chapter 7 of the *Principles* must, besides wages and labour, also comprise profits and capital. Moreover, such a reconstruction cannot ignore the fact that the rate of profits was envisaged by Ricardo as being determined first and foremost by the production conditions of "corn" at the agricultural margin, because he supposed "corn" to be strictly required for the workers' subsistence. This implies, firstly, that a model which is supposed to capture the underlying argument behind Ricardo's numerical example must distinguish between *necessaries* and *luxuries* and comprise at least three commodities: Apart from the two goods traded internationally, "cloth" and "wine", which for simplicity are here treated as luxuries,<sup>8</sup> a third commodity, "corn", must be introduced as a strictly necessary wage good that is produced under (intensively and extensively) diminishing returns due to a land constraint.<sup>9</sup> Secondly, in such a model it also cannot be ignored that Ricardo's treatment of wages was different from the modern one. In the "Ricardian trade model", where labour is the only factor of production and the entire income consists of wages that are supposed to be expended on cloth and wine, the levels of the real wage rates in the two countries depend on the productivity of labour in the production of the two traded commodities. Ricardo, however, treated real wages as *given*. And although he was clear about the fact that other commodities besides "corn" typically enter into the workers' wage bundles, Ricardo tended to focus attention on the production conditions of corn at the agricultural margin as the main determinant of the level of the money wage rate and of the general rate of profits. Accordingly, it is the two countries' rates of profits, and not their real wage rates, which are determined by the labour productivities in the production of corn at the agricultural margin.

The following sketch of a model is meant to capture these important aspects of Ricardo's trade theory. Suppose two countries, home and foreign, which produce three commodities, 1 (cloth), 2 (wine), and 3 (corn). The given subsistence requirements of the amounts of corn per unit of labour are supposed to be given by  $d_3(d_3^*)$ , so that we must have

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<sup>8</sup> While "wine" was clearly considered by Ricardo as a luxury not typically consumed by (English) workers, "cloth" was of course considered as a commodity which enters into the workers' subsistence basket. It is here treated as a luxury only in order to simplify the analysis.

<sup>9</sup> See also Walsh (1979).

$$(1) \quad w = p_3 d_3, \quad \text{and} \quad w^* = p_3^* d_3^*.$$

For simplicity, wages are assumed to be advanced at the beginning of the production period, which is the same for all commodities, and to be the only capital advances, so that commodities are produced by ‘unassisted labour’ alone.<sup>10</sup> Then the price of corn in home and foreign is determined as

$$(2) \quad p_3 = a_3(x_3)w(1+r), \quad \text{and} \quad p_3^* = a_3^*(x_3^*)w^*(1+r^*),$$

where  $a_3(x_3)$  and  $a_3^*(x_3^*)$  are the unit labour requirements at the agricultural margin, which however are not constant but supposed to depend on the total quantities of corn produced in home ( $x_3$ ) and foreign ( $x_3^*$ ) respectively. Similarly,  $a_i(x_i)$  and  $a_i^*(x_i^*)$  denote the two countries’ unit labour requirements in the production of commodities  $i = 1, 2$ , that is, cloth and wine, which also depend on the produced quantities in each country. The labour input coefficients in corn production are supposed to be strictly increasing functions of the amounts of corn produced, whereas the functional relationship between the unit labour inputs and the amounts produced of commodities 1 and 2 could be constant, rising, or falling. (In the latter case, increasing returns must be supposed to arise from firm-external economies.) The prices of commodities 1 and 2 in home and foreign are then given by

$$(3) \quad p_1 = a_1(x_1)w(1+r), \quad p_2 = a_2(x_2)w(1+r),$$

$$p_1^* = a_1^*(x_1^*)w^*(1+r^*), \quad \text{and} \quad p_2^* = a_2^*(x_2^*)w^*(1+r^*).$$

Of course, in autarky relative prices are proportional to relative labour contents. It is clear that, from eqs (1) and (2),  $w$  ( $w^*$ ) varies with the amount of corn produced in each country, that is, with  $x_3$  ( $x_3^*$ ), since  $p_3$  ( $p_3^*$ ) varies with it. Note, however, that with corn as the numéraire, the rate of profits  $r$  ( $r^*$ ) is determined, for each level of  $x_3$  ( $x_3^*$ ) in each of the two countries, from eqs (1) and (2) alone.

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<sup>10</sup> This simplifying assumption implies, of course, that we ignore the existence of produced means of production and/or of wages that are advanced over differing production periods for different commodities. For a more general analysis, in which these elements are taken into account, see Metcalfe and Steedman ([1973] 1979). The formulation adopted above allows us to follow Ricardo, who explicitly considered those more general elements in chapter 1 of the *Principles*, but then ignored them in the following chapters by supposing for simplicity that the relative values of commodities are governed by their relative labour contents.

This brief sketch suffices for my present purpose, which is to highlight some of the major differences between Ricardo's model of foreign trade and the so-called "Ricardian" trade model employed by Ruffin. As we saw above, in the "single-factor" model, where the entire income consists of wages, the high-productivity country must always exhibit a higher real wage rate than the low-productivity country, both before and after trade. In Ricardo's world, things are more complicated, for several reasons.

For Ricardo it is perfectly possible, for example, that the country that has an absolute *disadvantage* in the production of cloth and wine could exhibit the same real wage rate as the other country and a *higher* rate of profits in the no-trade situation. The reason for this is that Ricardo considered the money wage as being determined first and foremost by the production conditions of corn, so that the rate of profits is always higher in that country in which, at the agricultural margin, 'corn could be grown with less labour' (I: 136 n.). Moreover, foreign trade cannot raise the rate of profits unless it lowers the money wage, that is, unless the imported commodity enters into the workers' wage basket as a strict necessity. The import of a luxury commodity, such as the import of wine into England, therefore only increases 'the amount and variety on which revenue may be expended, [but] ... has no tendency to raise the profits of stock' (I: 133).

A further misunderstanding, which also derives from the fact that Ruffin in effect persists in ascribing a "one-factor" model to Ricardo, is the view that England, having an absolute disadvantage in the production of both commodities, is the "backward country", and Portugal is the "advanced country". This reading overlooks that in the passage which immediately precedes the numerical example Ricardo had observed:

[If] in consequence of the diminished rate of production in the lands of England, from the increase of capital and population, wages should rise, and profits fall, it would not follow that capital and population would necessarily move from England to Holland, or Spain, or Russia, where profits might be higher. (I: 134)

England is here considered as a country which has reached a higher stage of capitalistic development and where the accumulation of capital and the increase of population has advanced further than in Holland, Spain or Russia, that is, as a more advanced country. As Negishi has rightly pointed out, 'it is quite natural for Ricardo to assume a lower labor productivity in England, i.e., *in an advanced country*: ... Labor productivity in England is lower both in cloth and in wine than that in Portugal, because English lands are more densely

populated and more heavily invested than Portuguese lands' (1982: 205; emphasis added). In England, the direct and indirect labour contents of commodities are high because with diminishing returns in the production of "corn" more labour is needed in producing the principal wage good. This reading is confirmed by other statements in chapter 7, in which England is invariably treated as the world's most advanced manufacturing country, while Poland and America are considered as thinly populated backward countries with an abundance of fertile land.

## 2.2 Labour immobility a "key assumption"?

In Ruffin's interpretation, the problem that troubled Ricardo in the autumn of 1816 was that a country's exports did not necessarily contain the same quantity of (domestic) labour as the amount of (foreign) labour embodied in its imports. According to Ruffin, Ricardo was finally able to "solve" this problem (after a two-week period of intense intellectual effort in early October, reflected in his letters) by introducing the assumption of factor immobility.<sup>11</sup>

Ruffin stresses the importance of this assumption and observes, quite rightly, that Ricardo's exposition of the law of comparative advantage in terms of the famous numerical example 'is actually introduced by a 192-word treatment of factor immobility and capped by another 293-word analysis of factor immobility' (2002: 743). According to Ruffin, the two passages which "sandwich" the famous numerical example contain 'the key assumption that labor cannot move from England to Portugal' (2002: 743). Why Ruffin considers this assumption "key" is concisely stated by him in his 2005 paper, where he summarized his earlier contribution in these terms:

In Ruffin 2002, ... I showed that Ricardo adopted the labor theory of value in March 1816 and developed the law of comparative advantage in October 1816, when, in writing the chapter on foreign trade in *On the Principles of Political Economy and Taxation*, he was confronted with a contradiction between his labor theory of value and the fact that exports did not necessarily contain the same quantity of labor in the home country as the amount of labor in the foreign country embodied in a country's imports.

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<sup>11</sup> According to Ruffin, 'the hard part of his [Ricardo's] discovery was coming up with the key assumption of factor immobility' (2002: 727, 743).

... Apparently, to save his labor theory of value, Ricardo ... had to assume that labor is immobile between countries. (2005: 719)

The first thing to note is that the final statement makes no sense, because the assumption that labour is internationally immobile clearly contributes nothing to a ‘saving’ of the labour theory of value, since it implies that the ratio of international prices deviates from relative labour contents. Secondly, it needs to be stressed that in the two passages under consideration Ricardo was not referring to international immobility of *labour*, but rather to ‘immobility of capital and population’:

If the profits of capital employed in Yorkshire, should exceed those of capital employed in London, capital would speedily move from London to Yorkshire, and an equality of profits would be effected; but if in consequence of the diminished rate of production in the lands of England, from the increase of capital and population, wages should rise, and profits fall, *it would not follow that capital and population would necessarily move from England to Holland, or Spain, or Russia, where profits might be higher.* (I: 134; emphasis added)

Note that Ricardo refers only to *international profit rate differentials*, but makes no mention of wage differentials. This is because he supposes that the increase of capital and population in England is associated with a fall in the rate of profits (and an increase in rents), and a rise in *money* wages only, without altering the level of *real* wages. International wage differentials also play no role in the explanation he gives for the “unequal exchange” of English labour for Portuguese labour that occurs in the famous cloth and wine example:

The labour of 100 Englishmen cannot be given for that of 80 Englishmen, but the produce of the labour of 100 Englishmen may be given for the produce of the labour of 80 Portuguese, 60 Russians, or 120 East Indians. The difference in this respect, between a single country and many, is easily accounted for, *by considering the difficulty with which capital moves from one country to another, to seek a more profitable employment*, and the activity with which it invariably passes from one province to another in the same country. (I: 135-6; emphasis added)

He continues: ‘It would undoubtedly be advantageous to the capitalists of England, and to the consumers in both countries, that under such circumstances, the wine and 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' (I: 136). Removed by whom? According to Ricardo, the removal of capital and labour would be advantageous to 'the *capitalists* of England' (and to the consumers of both countries), but there is not necessarily an incentive for English workers to move, because the level of real wages in the two countries might well be the same (or it might even be lower in Portugal than in England). In fact, Ricardo did not consider it necessary to provide *any* explanation for international immobility of labour, but felt compelled to justify explicitly the assumption of immobility of capital, in the following terms:

Experience, however, shews, that 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, *check the emigration of capital*. These feelings, which I should be sorry to see weakened, induce most *men of property* to be satisfied with a low rate of profits in their own country, rather than seek a more advantageous employment for their wealth in foreign nations. (I: 136-7; emphases added)

Note that in this passage Ricardo refers to the 'emigration of capital' and to the natural disinclination of 'men of property' to quit their home country – not to any motives which might discourage workers from migrating. For Ricardo, the existence of comparative cost advantages provides no incentives for English workers to migrate; it is the capitalists only who could benefit by 'removing capital *and labour*' from England to Portugal.<sup>12</sup> Even at the domestic level, where he supposed labour and capital to be fully mobile, Ricardo did not conceive of workers as actively migrating from one industry to another. He rather envisaged intersectoral re-allocations of capital and labour as being governed primarily by the decisions of capitalists. For him, it is 'the manufacturers' who, in their constant search for higher profitability, 'are removing their capitals, *and the labour which they can command*, from one employment to another' (I: 262; emphasis added).

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<sup>12</sup> John Stuart Mill similarly argued that the inapplicability of the law of value in international exchange derives from the fact that 'men do not usually leave their country, or even send their capital abroad, for the sake of those small differences of profit which are sufficient to determine their choice of a business, or of an investment, in their own country and neighbourhood' ([1844] 1967: 237).

### 3. Ruffin's interpretation of Ricardo's three letters

We now turn to Ruffin's novel interpretation of Ricardo's statements in his letters of 5, 11, and 14 October 1816 (2002: 737-40). In Ruffin's view, these letters 'show a two-week period of great and sustained mental effort ... to the point of Ricardo's being uncharacteristically forgetful during the writing of his chapter on foreign trade' (2005: 719). Ricardo's 'sustained mental effort', Ruffin suggests, was related to his discovery of the comparative advantage principle, and this is reflected in some statements he made in his correspondence. Since Piero Sraffa, the editor of Ricardo's *Works and Correspondence*, had suggested a different reading of the relevant passages in Ricardo's three letters of 5, 11, and 14 October 1816 in his "Introduction" to the *Principles* (1951: xv-xvi), Ruffin's contention amounts in effect to charging Sraffa with misinterpretation: 'The reason that other scholars failed to note the importance of the October letters is that they were thrown off the track by a red herring' (2002: 737). Let us discuss the three letters in chronological order.

#### 3.1 Ricardo's letter to Malthus of 5 October 1816

Ruffin contends that the following passage in Ricardo's letter to Malthus of 5 October 1816 refers to international prices and comparative advantage:

I have been very much impeded by the question of price and value, my former ideas on those points not being correct. My present view may be equally faulty, for it leads to conclusions at variance with all my preconceived opinions. (VII: 71-2)

There are several facts which are difficult to reconcile with this interpretation. First, the context in which this passage occurs is clearly unrelated to foreign trade and international prices. The full paragraph in Ricardo's letter, from which this passage has been excerpted, reads as follows:

I hope your additional volume<sup>13</sup> will soon follow your new edition of the old work<sup>14</sup>. I shall be glad to see in a connected form your matured opinions on the progress of rent, profits, and wages, and in what manner they are affected by the increasing difficulty of procuring food, by the increase of capital, and the improvement of machinery. I fear we

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<sup>13</sup> This refers to Malthus's *Principles of Political Economy*.

<sup>14</sup> The reference here is to Malthus's *Essay on Population*.

shall not agree on these subjects, and I should be very glad if we could fairly submit our different views to the public, that we might have some able heads engaged in considering it. Of this however I have little hope for though I feel strongly the truth of my theory I cannot succeed in stating it clearly. *I have been very much impeded by the question of price and value, my former ideas on those points not being correct. My present view may be equally faulty, for it leads to conclusions at variance with all my preconceived opinions.* I shall continue to work, if only for my own satisfaction, till I have given my theory a consistent form. (VII: 71-2; italics added)

Ricardo's concern in this paragraph is unambiguously with what he calls 'my theory' of the progress of rent, profits, and wages, as opposed to Malthus's 'matured opinions' on the same subject. The passage quoted by Ruffin (given in italics above) is directly related to the preceding sentence, in which Ricardo states that he 'cannot succeed in stating it clearly', where 'it' refers to his theory of the progress of rent, profits, and wages: He had been prevented from stating his theory of income distribution clearly by the fact that he had found his 'former ideas' on the question of price and value to have been erroneous. Ruffin's interpretation of the italicized passage as referring to *international prices* can appear reasonable only when it is quoted in isolation, but must look absurd when the passage is read in its proper context.

### **3.2 Ricardo's letter to Malthus of 11 October 1816**

In support of his reconstruction Ruffin also provides a quotation from Ricardo's letter to Malthus of 11 October 1816, which, he contends, 'supports the interpretation that Ricardo was working out comparative advantage' in this period (2002: 739). The reference is to the following passage:

What would you say of two countries in which there are precisely equal capitals,—where wages are also equal, and where the population is precisely in the same number? Would the demand compared with the supply of capital be the same in both? If you say they would I ask whether their rate of profits would be the same under any other supposition but that of their land being exactly of the same degree of fertility? *To me it appears quite probable that the ordinary rate of profits might in one be 20 and in the other only 15 pc.<sup>t</sup> or in any other proportions.* (VII: 79; italics added)

Ruffin confined his quotation to the three rhetorical questions that Ricardo posed to Malthus. He did not take into consideration the final sentence (italicized above), which contradicts his interpretation. In Ruffin's view, the above passage (without the final sentence) 'shows that Ricardo was thinking about factor price equalization at this time' (2002: 739), and he contends: 'This is fortuitous for my hypothesis because chapter 7 *also* discusses factor price equalization conditions in a similar way (I: 142)' (2002: 739). And from the allegedly existing similarities between the two passages in Ricardo's letter and in chapter 7 Ruffin then concludes that Ricardo must have worked on foreign trade in this period, and that,

*in order to figure out comparative advantage, he [Ricardo] may have considered the disparate consequences of completely opposite views of the world, one in which the countries are identical with several factors and one in which they had different technologies and only one factor. (2002: 739)*

In my reading, Ruffin's interpretation is doubly wrong: Neither does the passage in Ricardo's letter to Malthus 'describe a factor price equalization world' nor did Ricardo 'discuss factor price equalization conditions in a similar way' in the relevant passage of the chapter "On foreign trade".<sup>15</sup> Let us first scrutinize the passage in the letter to Malthus of 11 October, reproduced above. In this passage Ricardo's concern is with challenging Malthus's view that the general rate of profits is determined by 'the demand as compared with the supply of capital' by contrasting it with his own theory, according to which the rate of profits depends on the level of proportional wages, which in turn are governed first and foremost by the 'degree of fertility' of the marginal land. In order to demonstrate the erroneousness of Malthus's view Ricardo constructs a hypothetical case, in which the difference between his own theory of profits and Malthus's can be presented in the clearest possible light. Under the conditions stated, 'the demand as compared with the supply of capital' would be the same in both countries, so that Malthus would have to conclude that the two countries must exhibit the same rate of profits. This contrasts sharply with Ricardo's claim (which is explicitly spelt out in the final sentence above) that the two countries' rates of profits could very well be quite different if their lands are not exactly of the same degree of fertility. The passage under consideration has nothing to do with "factor price equalization" consequent upon free trade.

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<sup>15</sup> I also disagree, of course, with Ruffin's view that Ricardo contemplated a world in which countries 'had different technologies and only one factor'.

We can now move on to the passage in chapter 7 of the *Principles* (I: 142), which according to Ruffin ‘discusses factor price equalization conditions in a similar way’. It reads:

Of two countries having precisely the same population, and the same quantity of land of equal fertility in cultivation, with the same knowledge too of agriculture, the prices of raw produce will be highest in that where the greater skill, and the better machinery is used in the manufacture of exportable commodities. The rate of profits will probably differ but little; for wages, or the real reward of the labourer, may be the same in both; but those wages, as well as raw produce, will be rated higher in money in that country, into which, from the advantages attending their skill and machinery, an abundance of money is imported in exchange for their goods. (I: 142)

Although there are some superficial similarities between this passage and the one in the letter to Malthus, there are also important differences. As we saw above, Ricardo’s concern in the letter was with discussing Malthus’s “demand-and-supply-of-capital” theory of profits. On the contrary, in the passage of chapter 7 his concern is with isolating the monetary causes of differences in the money price of raw produce in the two countries. In order to achieve this, he constructs a hypothetical case in which all “real” causes for different money prices of raw produce are eliminated, so that it is only the inflow of precious metals, in exchange for exported manufactures, which accounts for the higher money price of raw produce, and the associated higher money wage, in the more advanced country. It is interesting to note that the above passage, unlike the one in the Malthus letter, includes among the premises ‘the same quantity of land of equal fertility in cultivation’, but makes no reference to equal quantities of capital: If two countries have the same population (and therefore the same demand for raw produce), and the same agricultural technology as well as the same quantity of land of equal fertility in cultivation (and therefore the same marginal costs in the production of raw produce), the rate of profits could well be the same (or ‘differ but little’) in both countries, provided the real wage (that is, ‘the real reward of the labourer’) is also supposed to be the same. But since the more advanced country exports manufactures and imports gold, the value of money is lower, and money prices and money wages are higher, in this country than in the other. Note that the two countries are supposed by Ricardo to exhibit the same rate of profits although the “quantity of capital” employed in each is very different.

### 3.3 Ricardo's letter to Mill of 14 October 1816

The main piece of evidence put forward by Ruffin in support of his story is Ricardo's letter to James Mill of 14 October 1816 (VII: 82-4), in which he declared to have dispatched his manuscript, which (as we know from Mill's letter of 18 November 1816; see VII: 98-9) contained the first seven chapters of the *Principles*. Ruffin contends that in this letter 'Ricardo almost tells us he has just figured out comparative advantage' (2002: 737). Before we scrutinize Ruffin's interpretation of this letter, it seems useful to recall briefly Sraffa's alternative reading, which is contested by him. In Sraffa's interpretation, Ricardo, when urged by James Mill in mid-August 1816 to send him his papers,

delayed sending the manuscript for two months, under the pretext that he must copy it out. ... The real reason for the delay was that he had "been very much impeded by the question of price and value" [VII: 71] (as he wrote to Malthus), and that (as he informed Mill) he had "been beyond measure puzzled to find out the law of price." [VII: 83] "I found on a reference to figures that my former opinion could not be correct and I was full a fortnight pondering on my difficulty before I knew how to solve it." [VII: 83-4] This important change was evidently connected with the "curious effect" (to which he called Mill's attention in the same letter) of a rise of wages in *lowering* the prices of "those commodities which are chiefly obtained by the aid of machinery and fixed capital" [VII: 82]. (1951: xv-xvi)

Thus, Sraffa related Ricardo's "impediment" and "puzzlement", to which he referred in his letters of 5 and 14 October 1816, to his detection of the "curious effect" which a rise of wages produces on relative prices. Now Ruffin cannot possibly deny, of course, that in the first two paragraphs of the 14 October letter Ricardo refers explicitly to the 'curious effect' (VII: 82). He contends, however, that Ricardo's statement in the fourth paragraph ("I have been beyond measure puzzled to find out the law of price. ...") is unrelated to the content of the first two paragraphs, and instead refers to *international* prices. What arguments does he have in support of this hypothesis?

First, he contends that the effect referred to, which is now known as the "Ricardo effect", could not possibly have caused Ricardo so much headaches, because it 'is just a "curious effect" and not one that is "puzzling"' (2002: 738). The reason he gives for this judgment is that the proposition under consideration requires only 'a rather elementary calculation', one that 'would have been obvious to a Ricardo' (2002: 740). Of course, whether one considers a

particular proposition “obvious” and “elementary” or “curious” and “puzzling” is partly a matter of individual taste and personal judgment – but must surely depend also on the *meaning* that one attributes to the proposition under consideration. In Ruffin’s understanding, the “Ricardo effect” ‘arises from the fact that the fraction of labor costs differs among goods; thus, when wages rise, the relative value of goods that are capital-intensive should fall’ (2002: 740). And in Ruffin’s view it is obvious that ‘the Ricardo effect is a crude version of matters that are now included in the famous Stolper-Samuelson theorem’ (2002: 737).

This raises a number of points which need to be clarified. First of all, it must be stressed that Ruffin’s contention that ‘for a Ricardo’ the proposition to which he referred in the letter as ‘the curious effect’ would have been “obvious” and “elementary” is contradicted by Ricardo’s own words when he writes to Mill: ‘You will see the curious effect which the rise of wages produces on the prices of those commodities which are chiefly obtained by the aid of machinery and fixed capital. I hope you will be able to make out what I have said on that subject, and will give me your well considered opinion *on this difficult point*’ (VII: 83; emphasis added).<sup>16</sup> Secondly, Ruffin’s belittling of Ricardo’s difficulties in coming to grips with this “difficult point” indicates that he is unaware of Ricardo’s struggles to free himself from the generally accepted view, handed down by Adam Smith, that a rise of wages must raise the prices of all commodities.<sup>17</sup> Third, and most importantly, Ruffin’s remarks also reveal that his own understanding of the so-called “Ricardo effect” is in terms of a simple “two-factor” model, in which “labour” and “capital” are considered as two original factors of production, and that he also attributes such a naïve “two-factor” model to Ricardo. But this overlooks not only that wages were generally treated by Ricardo as part of the advanced capital, but also that he conceived of capital not as an original “factor of production”, but as a heterogeneous set of produced means of production. It is therefore by no means a coincidence that he related the “curious effect” to commodities ‘which are chiefly obtained by the aid of

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<sup>16</sup> That Ricardo considered this finding by no means “obvious” and “elementary” is also sufficiently shown by his statement in chapter 1 of the *Principles* (1<sup>st</sup> ed.) that ‘[these] results are of such importance to the science of political economy, yet accord so little with some of its received doctrines, which maintain that every rise in wages is necessarily transferred to the price of commodities, that it may not be superfluous to elucidate the subject still further’ (I: 61).

<sup>17</sup> For a comprehensive account of this struggle, see Garegnani (1982).

machinery and fixed capital’– and not to “capital-intensive” goods in general (whatever that is supposed to mean).<sup>18</sup>

Let us return, then, to the passage in the 14 October letter which, Ruffin contends, Sraffa had misinterpreted by relating it to the “curious effect” passage at the beginning of the letter. It reads:

I have been beyond measure puzzled to find out the law of price. I found on a reference to figures that my former opinion could not be correct and I was full a fortnight pondering on my difficulty before I knew how to solve it. During that time I could not proceed or I should have made greater progress. I shall now consider the subject of taxation. (VII: 83-4)

Ruffin claims that in this passage ‘Ricardo had foreign trade in mind, not the Ricardo effect that Sraffa guessed’ (2002: 738). Let us suppose for a moment that this is true. Then two implications follow. First, Ricardo’s use of the phrase ‘to find out the law of price’ must then be taken to mean<sup>19</sup> that he was trying to establish ‘the law of price’ in international trade, that is, to go beyond the negative claim that ‘[the] same rule that regulates the relative value of commodities in one country, does not regulate the relative value of the commodities exchanged between two or more countries’ (I: 133). Secondly, Ricardo’s statement that after a strenuous fortnight he finally ‘knew how to solve it’ must be taken to mean that he believed to have solved *this* problem: to have established ‘the law of price’ *in international trade*. This brings us to an interesting substantial issue with regard to the interpretation of Ricardo’s chapter “On foreign trade”, namely to the question whether or not Ricardo had any rule for the determination of the terms of trade, and if so, what this rule was.

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<sup>18</sup> For a more detailed analysis of the meaning and validity of the so-called “Ricardo effect”, see Gehrke (2003).

<sup>19</sup> Obviously, Ruffin’s interpretation of this passage also implies, as he himself notes, that Ricardo’s phrase ‘my former opinion’ must then be taken to refer to the proposition ‘that value was *always* [i.e., also in international trade] governed by relative labor costs’ (2002: 738; italics added). Since we have already discussed the implausibility of this hypothesis in Section 3.1 above, in relation to Ricardo’s letter to Malthus of 5 October 1816, there is no need to repeat it here.

The standard view in the literature, to which Ruffin also seems to subscribe,<sup>20</sup> is that Ricardo had failed to provide a rule for the determination of international values, had supposed an arbitrary distribution of the gains from trade, and had omitted to specify the limiting price ratios for the terms of trade.<sup>21</sup> This view goes back, of course, to John Stuart Mill, who had suggested in his essay “Of the Laws of Interchange between Nations” that Ricardo had failed to note that the terms of trade are bounded by the autarky price ratios, and that in order to determine the terms of trade ‘we must revert to a principle anterior to that of cost of production, and from which this last flows as a consequence,— namely, the principle of demand and supply’ ([1844] 1967: 237). With the correct reading of Ricardo’s four numbers, however, Mill’s charge appears to lose its foundation. Ruffin notes, quite rightly, that it was Mill who ‘was responsible for the rational reconstruction of Ricardo in which the labor cost coefficients were interpreted as the amounts used in a unit of each good produced rather than Ricardo’s labor cost of producing the amounts contained in a typical trading bundle’ (2002: 742-3).<sup>22</sup> But Ruffin does not see that, firstly, Ricardo’s exposition, as it was not confined to constant returns, deliberately left the autarky price ratios indeterminate, and that, secondly, Ricardo could have envisaged a determination of the terms of trade that can do without Mill’s ‘anterior principle of demand and supply’, by directly relating international prices to costs of production.

The terms of trade in Ricardo’s numerical example are not arbitrarily given, but rather derive from a price rule, which he stated explicitly in chapter 28 of the *Principles*:<sup>23</sup>

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<sup>20</sup> This is not stated explicitly by Ruffin, but can be inferred from the praise which he showers on J. S. Mill: ‘It was John Stuart Mill who gave the analysis of comparative advantage the form that became an engine of analysis for generations to come and the starting point for all further developments in trade theory.’ (2002: 742)

<sup>21</sup> With regard to the latter two points, see, for example, Samuel Hollander’s assessment: ‘Ricardo did not formally specify the limits to the terms of trade, although doubtless it was self-evident that they are determined by the ‘internal’ commodity exchange rates (relative labour inputs) in his example. Moreover, he failed to justify his assertion that the terms of trade would settle approximately half way between the limiting ratios.’ (1979: 464)

<sup>22</sup> Although it was certainly John Stuart Mill’s exposition, in his essay of 1844 and in chapter 18 of his *Principles*, which must be held responsible for the dissemination of the erroneous interpretation of Ricardo’s four numbers as unit labour requirements, the origin of this misinterpretation was the exposition in the first edition of James Mill’s *Elements of Political Economy* (1821: 85-6).

<sup>23</sup> See also Negishi (1996b: 98) and Aldrich (2004: 388).

[It] is the natural price of commodities in the exporting country, which ultimately regulates the prices at which they shall be sold, if they are not the objects of monopoly, in the importing country. (I: 375)

This rule can be exemplified with regard to the wine-and-cloth example, where the terms of trade are determined by the with-trade prices of commodities 1 and 2,

$$(4) \quad p_1^T = a_1(x_1)w(1+r), \quad \text{and} \quad p_2^T = a_2^*(x_2^*)w^*(1+r^*).$$

In the simplified case contemplated in the model set out in Section 2.1, where the traded commodities are supposed for simplicity as not entering into the workers' wage baskets as strict necessities, the four distributive variables  $w, w^*, r$  and  $r^*$  are determined from eqs (1) and (2) alone, so that the natural prices of commodities 1 and 2 are determined once the quantities produced of them are known. However, when one of the internationally traded commodities is corn,<sup>24</sup> or when cloth or wine are supposed to be necessities for the workers' subsistence as well, eqs (4) are under-determined, since the with-trade money wage rates and the with-trade profit rates in the two countries are no longer determined from eqs (1) and (2) alone. When, for instance, besides corn also a certain quantity of cloth, designated by  $d_1(d_1^*)$ , is necessary for the workers' subsistence, eqs (1) must be modified to read

$$(1') \quad w = p_1 d_1 + p_3 d_3, \quad w^* = p_1^* d_1^* + p_3^* d_3^*,$$

and the wage rates could then no longer be determined from eqs (1) and (2) alone.

If Ricardo envisaged a determination of international prices without recourse to reciprocal demands, the question arises how demand changes can be absorbed without altering the terms of trade. A compelling answer, which was first proposed by Negishi ([1996] 2000: 98), is that changes in demands are absorbed by corresponding changes in supplies, and do not induce any price changes unless production costs change as a result of changes in the quantities produced. This is the basic principle of Ricardo's classical approach to the determination of long-period prices:

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<sup>24</sup> As Ricardo noted, with international trade in corn there need not be complete specialization: 'It will appear then, that a country possessing very considerable advantages in machinery and skill, and which may therefore be enabled to manufacture commodities with much less labour than her neighbors, may, in return for such commodities, *import a portion of the corn required for its consumption*, even if its lands were more fertile, and corn could be grown with less labour than in the country from which it was imported.' (I: 136, note)

It is the cost of production which must ultimately regulate the price of commodities, and not, as has often been said, the proportion between the supply and demand: the proportion between supply and demand may, indeed, for a time, affect the market value of a commodity, until it is supplied in greater or less abundance, according as the demand may have increased or diminished; but this effect will be only of a temporary duration. (I: 382)

For Ricardo, this principle remains intact also in open economies with international trade in commodities. For example, if corn is imported into England from France, its price in England, Ricardo contends, is governed by its natural price in France,<sup>25</sup> ‘and it would remain at this price, whether England consumed a hundred thousand, or a million of quarters’ (I: 374-5). But this does not mean that the natural price in France is unaffected by the English demand for corn:

If the demand of England were for the latter quantity, it is probable that, owing to the necessity under which France would be, of having recourse to land of a worse quality, to furnish this large supply, the natural price would rise in France; and this would of course affect also the price of corn in England. *All I contend for is, that it is the natural price of commodities in the exporting country, which ultimately regulates the prices at which they shall be sold, if they are not the objects of monopoly, in the importing country.* (I: 375; emphasis added)

With international trade in commodities which are produced at non-constant costs, foreign demand can alter the production costs and thus the natural prices, because it alters the total quantities supplied. Therefore, the terms of trade are *not* independent of demand, but the influence of changes in foreign demand is by way of directly affecting the long-period supply prices. Once this is understood, it is also possible to see that the charge commonly leveled at Ricardo of having failed to specify the limits of the terms of trade is unfounded. With non-constant returns in the production of the traded commodities, a change in the amounts traded will alter the quantities that have to be supplied and thus their production costs. Accordingly, the limits are not given and constant, independently of the terms of trade, but subject to

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<sup>25</sup> Ricardo refers to ‘the natural price, viz. that price which is necessary to its production, and without which it could not be cultivated’ in France; he also refers to it as ‘the price at which it could be furnished to the English market, and afford the usual and ordinary profits of stock in France’ (I: 374).

change with changing terms of trade, since the total amounts traded are liable to change with changing terms of trade.

### **3.4 Further arguments invoked by Ruffin in support of his interpretation**

A seemingly very compelling argument invoked in support of the discussed interpretation is the fact that the manuscript which Ricardo dispatched to Mill on 14 October 1816 contained a draft of the first seven chapters of the *Principles*, and that Ricardo had announced in his accompanying letter that he would ‘now consider the subject of taxation (VIII: 849). By adopting the plausible assumption that Ricardo had worked on the chapters in the same order in which they appeared in the book, Ruffin (2002: 738) concluded that he must have been engaged in the writing of chapter 7 shortly before he dispatched the manuscript, that is, in the first two weeks of October 1816.

It should be clear that in the preceding discussion it was not necessarily denied that Ricardo might have worked on the chapter on foreign trade in late September or early October 1816. What has been questioned is Ruffin’s novel interpretation of the passages in Ricardo’s letters to Mill and Malthus as referring to international prices and foreign trade, and the associated charge of misinterpretation by Sraffa. Bearing this in mind, we may briefly discuss a further argument put forward by the author in support of his interpretation: the implausibility of an alternative (or – from his perspective – a *counterfactual*) hypothesis:

If Ricardo was not writing chapter 7 during this two-week period, he then would have to write the chapter on foreign trade earlier and there is no evidence of the intense intellectual effort required to invent comparative advantage in earlier letters. (2002: 740-41 n).

This argument is based on two premises. First, it presupposes that the development of the law of comparative advantage must have required ‘an intense intellectual effort’, and, secondly, that this effort must be reflected in Ricardo’s correspondence. There is little point in discussing the second premise (which of course may, but need not necessarily hold true), but a brief discussion of the first one can be of some interest, because it leads us directly into the discussion of alternative reconstructions of Ricardo’s discovery of the comparative advantage theory. The requirement of an ‘intense intellectual effort’ for its discovery is, of course, merely a hypothesis – one could equally well suggest, as Jacob Viner (1937: 440) has in fact

done, that when Ricardo expounded the law of comparative advantage he was merely applying the “eighteenth century rule” and tracing out some of its logical implications.<sup>26</sup> And in further following up on Viner’s suggestion, one could then also take into account, in an attempt to explain the “thought processes” involved in Ricardo’s discovery of comparative advantage, John Chipman’s finding that ‘lurking in the Gervaise-Hume theory of the international distribution of the precious metals, and brought out quite explicitly by Thornton, is the origin of the theory of comparative advantage’ (2008 [1984]: 267 [2]).<sup>27</sup> In my view, an attempted reconstruction of the path that finally led to Ricardo’s exposition of the comparative advantage principle in chap. 7 of his *Principles* must consider Chipman’s argument that ‘the law of comparative advantage, as applied to trade in goods and coin’ (2008 [1984]: 306) was first expounded by Henry Thornton in 1802, from where it ‘was absorbed into Ricardo’s early work’, that is, into his monetary writings of 1811, in order to be later extended by him ‘to the explanation of trade in commodities other than money’ in chapter 7 of the *Principles* (2008 [1987]: 217). This line of development is suggested also by the role which the principle of arbitrage, with which a stock-jobber like Ricardo can safely be assumed to have been familiar, plays in his argument on foreign trade.<sup>28</sup>

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<sup>26</sup> The “eighteenth century rule” stipulates that it is beneficial for a country to import commodities whenever it can obtain them in exchange for exports whose production entails less real costs compared to the domestic production of the same amount of the imported commodities. According to Viner ‘the doctrine of comparative costs is, indeed, but a statement of some of the implications of this rule’ (1937: 440). He added: ‘[The] explicit statement that imports could be profitable even though the commodity imported could be produced at less cost at home than abroad was, it seems to me, the sole addition of consequence which the doctrine of comparative costs made to the eighteenth century rule. Its chief service was to correct the previously prevalent error that under free trade all commodities would necessarily tend to be produced in the locations where their real costs of production were lowest.’ (1937: 441) Interestingly, Edgeworth also regarded the comparative cost principle, in its generalized form, as “obvious”: ‘Foreign trade would not go on unless it seemed less costly to each of the parties to it to obtain imports in exchange for exports than to produce them at home. This is the generalized statement of the principle of comparative cost, with respect to its positive part at least.’ (1925, II: 6)

<sup>27</sup> Chipman briefly expounded this reconstruction in his entry on “International Trade” in the (old) *New Palgrave* (2008b [1987]: 216-7) and in much greater detail in his little-known paper on “Balance-of-Payments Theory from Locke to Ricardo” (2008a [1984]).

<sup>28</sup> On the principle of arbitrage in Ricardo’s trade theory, see Kurz (2015). Some further hints for an alternative reconstruction are suggested by Pullen (2006) and De Vivo (2010), who both discuss early anonymous contributions to the exposition of the comparative advantage principle and suggest that the latter was perhaps common knowledge among commodity traders, so that Ricardo’s (and Torrens’s) statements on the law of comparative advantage cannot really be regarded as a “discovery” at all.

It remains for us, then, to correct an interpretative statement in the final section of Ruffin's paper, where he showed convincingly, contra Thweatt (1976), that Ricardo had referred to comparative advantage not only in chapter 7 of the *Principles* but in other chapters and writings as well, and also in a letter to McCulloch of 23 March 1823. According to him, this letter 'shows Ricardo's remarkable quantitative insight that protection to agriculture could keep profits at home higher than abroad' (2002: 745). The relevant passage, Ruffin contends, shows not only

that Ricardo never gave up on comparative advantage; but it also shows his ability to see the world in more general terms than his simple labor cost view. If two countries have the same commodity prices and the same profit rate, under the conditions postulated by Ricardo the advanced country would specialize in manufacturers [*sic*] and the undeveloped country in corn. If a tariff is imposed on corn, then the rate of profit could be higher in the more advanced country. (2002: 745)

In this reading Ricardo anticipated a result of modern trade theory, according to which the imposition of an import tariff could raise the rate of profit in the importing country. But the argument which Ricardo put forward in his letter to McCulloch is different; it is simply a corollary of his theory of profits, as it was first expounded in the *Essay on Profits* and then developed further in the *Principles*. This is evident if we look at the passage in Ricardo's letter to McCulloch which Ruffin quoted in support of his interpretation and re-insert the final part (italicized below):

I have put the case in my book [1: 136n] of a country having a very little superiority over its neighbours in the production of corn but a very great one in the production of manufactured goods. In such a country, notwithstanding a corn law, profits would be higher than in the neighbouring countries, and consequently no capital would flow from it, *although it should refuse to import cheap corn.* (VIII: 358; italics added)

Ricardo's point is that the rate of profits could be higher in England than in the neighboring countries – not *because* a tariff is imposed on corn imports but rather *in spite of the fact* that the corn laws prohibit the importation of cheap corn. As long as the more advanced country (England) has 'a very little superiority over its neighbors in the production of corn', the rate of profits could be higher than abroad, even if she 'should refuse to import cheap corn', because the production costs of corn (estimated in terms of the amount of labour

required at the agricultural margin) are lower than abroad. Therefore McCulloch's fear<sup>29</sup> is unfounded that capital, in search of more profitable employment abroad, will necessarily flow out of England whilst the corn laws are in force:

You infer too strongly I think that profits abroad exceed profits here by the whole difference in the *money price of corn*. My opinion is this – if we were allowed to get corn as cheap as we could get it, by importation, profits would be very considerably higher than they now are; but this is a very different thing from saying that profits are very considerably lower here than abroad. It is quite possible (tho I do not believe it is true) that profits may be higher here than abroad. It is possible that the *labour price of corn* may be cheaper here than in the countries from which we should import corn if trade were free and open. (VIII: 357-8)

Although the *money price of corn* is lower in the neighboring countries than in England, the *labour price of corn* might be higher – and if that was indeed the case, the general rate of profits would be lower than in England, so that there is no incentive for moving English capital abroad. This passage shows that Ricardo was clear about the fact that for corn to be imported into England a higher “*labour price*” abroad must be associated with a lower *money price*. The neighboring country has a comparative advantage, but an absolute *disadvantage*, in the production of corn. Therefore, ‘if trade were free and open’, corn would be imported into England, and this would cause money wages to fall and the rate of profits to rise in England. It is thus not the imposition of a tariff, but rather the *removal of trade restrictions*, which could raise the rate of profits in the more advanced country.

This shows, again, that the relationship between “factor prices” and trade based on comparative advantage is much more complicated in Ricardo's theoretical system than in the simple “one-factor” model by which modern trade theorists have tried to capture it.

#### 4. Conclusions

In his article on the reconstruction of Ricardo's discovery of comparative advantage Ruffin (2002) has made a valuable contribution by correcting the common misinterpretation of the four numbers in Ricardo's famous numerical example of England and Portugal trading cloth

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<sup>29</sup> See McCulloch's letter to Ricardo of 13 March 1821 (VIII: 353).

and wine with each other. The erroneous reading of the four numbers as unit labour requirements, which seems to have been introduced by James and John Stuart Mill in 1821–29, has significantly contributed to the transformation of Ricardo’s formulation of the comparative advantage theory, which was embedded in his classical approach to the theory of value and distribution, into the form it was given a century later by Gottfried Haberler (1930) in terms of the so-called “Ricardian” trade model. Ruffin therefore deserves credit for having resurrected from oblivion Sraffa’s earlier statement on the correct reading of Ricardo’s four numbers, which has been overlooked for several decades. Ricardo’s formulation of the law of comparative advantage can now be seen to be compatible with non-constant returns and incomplete specialization, and the charge of logical incompleteness in Ricardo’s exposition can be conclusively refuted. Moreover, it can also be appreciated that Ricardo envisaged a determination of the terms of trade without recourse to reciprocal demands, by directly relating international prices to costs of production. It should be pointed out, however, that except in the special case in which the traded commodities are considered as not entering into the wage basket as strict necessities the terms of trade cannot be determined independently of, and prior to, the distributive variables in the two countries trading with each other.

However, Ruffin’s novel interpretation of Ricardo’s statements in his letters of October 1816 does not seem to be robust, nor does his account of the “thought processes” involved in Ricardo’s discovery of the comparative advantage theory. It is therefore suggested to re-open the discussion on the path by which Ricardo arrived at the law of comparative advantage.

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