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Abstract

Due to a precise definition of comparative advantage and a deeper understanding of the logical interrelationships between this proposition and the two other main elements in David Ricardo's famous numerical example – the classical rule of specialization and the proposition regarding the non-appliance of the labor theory of value in international exchanges –, it is possible to fully appreciate the merits of his proof of comparative advantage in chapter seven of the *Principles*. This has important consequences for the longstanding authorship-debate over comparative advantage, because it leads to a more accurate account of the crucial omissions and shortcomings in Robert Torrens' competing statement in his *Essay on the External Corn Trade* (1815). Since Torrens fell short of formulating a full proof of the comparative-advantage proposition prior to the publication of the *Principles*, he is not entitled to the same amount of merit as Ricardo.[2]

Keywords: comparative advantage, David Ricardo, Robert Torrens, international trade theory, classical rule of specialization

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Introduction

In science the credit goes to the man who convinces the world, not to the man to whom the idea first occurs.

Francis Darwin

Since the first half of the nineteenth century until the present there has been an ongoing debate among economists about the accurate attribution of authorship-merits for the comparative-advantage proposition. Resuming the many twists and turns of this long-standing controversy, Roy J. Ruffin (2002, pp. 727-728) critically asserts:

> "Historians of the law of comparative advantage have turned a relatively simple and beautiful story into a confused tangle of claims of priority, error, incompleteness, and attribution. It has been said that Robert Torrens (1780-1864) deserves the credit for discovering the law; James Mill (1773-1836) gave the theory to Ricardo; Ricardo had no interest in the law after it appeared; and Ricardo's exposition is deeply incomplete."

Although the majority of scholars have traditionally sided with David Ricardo, some prestigious scholars have favored Robert Torrens, based on the claim that his *Essay on the External Corn Trade* (1815) was published two years before Ricardo's *Principles* and already contained a satisfactory enunciation of the comparative-advantage proposition.[3] It turned out recently, though, that with the notable exemptions of Sraffa (1930) and Ruffin (2002) – both Ricardo-supporters –, the rest of the participants in this longstanding academic dispute had either an incomplete or flatly wrong understanding of the famous numerical proof of comparative advantage in chapter seven of the *Principles*. Because of this lack of understanding, it seems to me perfectly clear now why there has been such a hassle in identifying the rightful author of this proposition.

Ruffin (2002; 2005) has been lately the most outspoken scholar against granting Torrens priority over Ricardo for the formulation of the comparative-advantage proposition. His 2002 paper indeed represents a significant turning point in the longstanding authorship-debate over comparative advantage. In addition to the accurate interpretation of Ricardo's numbers as number of men working for a year required to produce *some unspecified amounts of wine and*

[3] See, for example, Seligman (1903, p. 344), Chipman (1965, p. 482), and Samuel Hollander (1979, p. 461).

cloth traded between England and Portugal, the paper also offers some valuable insights about the concrete circumstances and probable date of Ricardo's formulation of the proposition. Moreover, it also contains Ruffin's first attempt of rejecting Torrens' claim of authorship by referring to the incomplete nature of the comparative-advantage statement in the 1815 pamphlet (Ruffin, 2002, pp. 731-735).

Ruffin's valuable insights persuaded some well-known scholars like Douglas Irwin and Andrea Maneschi to join the ranks of the Ricardo-supporters. Both Irwin (1998) and Maneschi (1998) had previously discussed without disputing John Chipman's assessment (1965, p. 482) that the credit for the principal discovery should go to Torrens, but later withdrew their tacit support of Torrens in a personal communication to Ruffin.

Notwithstanding these notable conversions, the authorship-debate over comparative advantage is far from over. On the contrary, it seems to be headed again in the wrong direction. John Aldrich (2004, pp. 379-380), for example, believes that there is much common ground between Ruffin (2002) and his own opposing conclusions on the subject, which are the following:

> "Torrens, Ricardo and the Mills all made contributions to the discovery of comparative advantage, not by a major multiple discovery but through a sequence of insights and arguments. Ricardo developed Torrens's insight, that a country may import corn that is more costly to produce abroad, in the direction of a general demonstration that the law of value for domestic transactions does not hold for international ones. From the demonstration James Mill extracted the principle of comparative advantage and gave it ''due emphasis.'' Torrens had not formulated, nor even grasped the principle, while Ricardo had not appreciated there was a principle worth developing. It was from Mill's Elements, and the works that followed, that other economists learned the principle. However Mill's clear and emphatic statement of the principle was supported by unsound arguments. These were repaired by his son in an essay published only in 1844. This provided at last an ''appropriate setting'' for the doctrine, as well as convincing support for Ricardo's original value claim."

Aldrich claims that Ricardo and Torrens were not the only ones who contributed to the discovery of comparative advantage, but also James and John Stuart Mill. He further asserts that Ricardo did not appreciate that there was a principle worth developing. Moreover, Kemp and Osaka (2006) suggest in a footnote that Ricardo took the comparative-advantage insight from Torrens, calling it the *Torrens-Ricardo Principle of Comparative Advantage*. Ruffin (2005), on the other hand, proposes a novel and questionable approach for rejecting Torrens' claim by affirming in a second paper on the subject that the latter was the author and main advocate of the so-called absolute cost advantage theory of trade. According to Ruffin, this automatically disqualifies any authorship claim that Torrens might have had, since one can hardly pretend to be the author of two mutually exclusive propositions at the same time.

There are two main reasons for the persistency of the authorship-debate over comparative advantage: first, scholars have different notions about comparative advantage; and second, some of them continue to believe that Torrens's 1815 statement, although not perfect, seems to be good enough for granting him part or even the bulk of the merit over Ricardo. Both issues will be addressed in the present paper. Its merit over previous efforts consists in offering a definition of comparative advantage that seems to be closest to Ricardo's original understanding of it. Furthermore, the paper also highlights the logical interrelationships between the comparative-advantage proposition and the other two key elements in Ricardo famous numerical proof: the non-appliance of the labor theory of value in international transactions and the classical rule of specialization. These findings shed a brighter light on the crucial shortcomings and omissions in Torrens' 1815 statement, and further emphasize Ricardo's great accomplishment so that it can be appreciated to its full extent.

The paper is structured as follows. The first section presents some definitions of comparative advantage used by other scholars in the authorship-debate. The second section offers a definition of comparative advantage which I consider to be the closest to Ricardo's original statement in the *Principles*, followed by an analysis of the crucial logical interrelationships between this proposition and the two other important elements mentioned above. The third section specifies the achievement with regard to comparative advantage. This is a necessary step prior to the detailed examination of Torrens' 1815 statement in the next section. Finally, the last section before the conclusions critically reviews Ruffin's claim that Torrens was the author of the absolute cost advantage theory of trade. While agreeing with Ruffin's main conclusion that Ricardo deserves the merit for the demonstration of the comparative-advantage proposition, the present paper argues that Torrens' presumed advocacy of the absolute advantage theory of trade – even if it turns out to be true – is rather irrelevant for judging his merits with respect to the disputed proposition.

The Elusive Concept of Comparative Advantage

As already mentioned, one of the reasons for the continued disagreement among scholars about who should be credited for the formulation of the comparative-advantage proposition is the fact that there are actually different definitions of the concept in the literature. This diversity of notions of comparative advantage is indeed a major obstacle for resolving the longstanding dispute, since any accurate and fair attribution of merit for the formulation of a new concept, proposition or theory requires a precise understanding and specification of the achievement for which somebody should be credited. Without this essential requirement, any attribution of merit ultimately becomes an arbitrary and questionable exercise. It is therefore mandatory to start off with a clear definition of comparative advantage.

If one consults the most recent papers on the authorship-debate – Ruffin (2002, 2005) and Aldrich (2004) – in search for a suitable definition of comparative advantage, it becomes immediately clear that the task is more complicated than originally thought. Aldrich (2004, p. 380), for example, interprets the "doctrine of comparative costs" or "principle of comparative advantage" as a general principle on the lines of this from Viner (1937, p. 438): "(…) if trade is left free each country in the long run tends to specialize in the production of and to export those commodities in whose production it enjoys a comparative advantage in terms of real costs, and to obtain by importation those commodities which could be produced at home only at a comparative disadvantage in terms of real costs, and that such specialisation is to the mutual advantage of the countries participating in it."

I don't consider the above statement particularly useful for the purpose of defining comparative advantage, since one cannot offer a proper definition of a concept by recurring to the very same concept. What does it actually mean to enjoy a comparative advantage or disadvantage in terms of real costs?

Ruffin (2002, pp. 729-730), on the other hand, defines what he calls the "law of comparative advantage" by two inequalities. His definition, though, is based on the Ricardian trade model which can be found in nearly every contemporary economic textbook. Notwithstanding the reference to Ricardo, the textbook trade model differs rather significantly from the original proof of comparative advantage in the *Principles,* as Maneschi (2004, 2008), Pullen (220) and Ruffin (2002) himself have recognized. It is therefore unsuitable to try to understand and appreciate what Ricardo wrote by starting with a definition of comparative advantage that is based on the textbook trade model, as Ruffin does.

In my opinion, such a methodological approach adds an unnecessary layer of complexity to the task. It is more fitting as well as simpler to define Ricardo's insight by what he actually wrote in the *Principles*, as the following section will show.

Ricardo's Understanding and Use of Comparative Advantage

Ricardo (Vol. 1, p. 133)[4] offers in chapter seven of the *Principles* a simple numerical proof for the proposition that "the same rule which regulates the relative value of commodities in one country, does not regulate the relative value of the commodities exchanged between two or more countries." He meant by that of course that his labor theory of value does not regulate the relative value of commodities in international transactions.

After offering a full proof of this proposition in the famous numerical example, he makes the following remark: "This exchange might even take place, notwithstanding that the commodity imported by Portugal could be produced there with less labour than in England. Though she could make the cloth with the labour of 90 men, she would import it from a country where it required the labour of 100 men to produce it, because it would be advantageous to her rather to employ her capital in the production of wine, for which she would obtain more cloth from England, than she could produce by diverting a portion of her capital from the cultivation of vines to the manufacture of cloth (Vol. 1, p. 135)." This remark is the essence of what later has been known as comparative advantage.

According to Ricardo, thus, comparative advantage is the proposition that a country might import a certain amount of a commodity although it could produce the same amount internally at lower real costs[5] than the exporting country. This definition of the comparative-advantage proposition is not only supported by what he wrote in the *Principles*, but also corresponds to the way in which James Mill refer to it in a letter to Ricardo after reviewing the manuscript of the *Principles*. Mill wrote to Ricardo: "The inquiry concerning foreign trade (...) is like the rest, original, and sound, and excellently demonstrated. That foreign trade augments not the value of a nations property: *that it may be good for a country to import commodities from a country where the production of those same commodities costs*

[4] Throughout this paper, all direct quotations of Ricardo are extracted from *The Works and Correspondence of David Ricardo,* Volume I to XI, 2004, edited by Piero Sraffa. I will refer to them usually by indicating the volume and page numbers only.

[5] By real costs I mean in this paper the amount of labor time necessary to produce the commodities.

more, than it would cost at home: that a change in manufacturing skill in one country, produces a new distribution of the precious metals, are *new propositions of the highest importance*, and which you fully prove" (Vol. 7, p. 99; emphasis added). It is important to point out here that I could not find in their correspondence any objection of Ricardo with regard to this passage of Mill's letter.

The importance of the comparative-advantage proposition for the free-trade case consists in the fact that it demonstrates that a country does not need to have a productivity advantage over another in order to trade under mutually beneficial terms. It extends thus the occasions in which international trade is considered to be mutually beneficial by including the most unfavorable setting that one can possibly conceive: the occasion where a country is less productive than another in the production of every commodity and does not have the exclusive capacity to produce any good. Because the comparative-advantage proposition proves that free trade is mutually beneficial even under this most inconvenient setting, it has been often considered as the ultimate case for free trade. Notwithstanding the fact that it might be possible to build a persuasive case for free trade predominantly or even exclusively on this proposition, I would not recommend to do so, specially if one uses for this purpose the textbook trade model of comparative advantage rather than Ricardo's original statement, as has been the common practice during the last decades. Since the textbook trade model relies on all kind of unrealistic assumptions like constant returns to scale and perfect competition, it will most likely fail to convince the public.

In this respect it is interesting to acknowledge that Ricardo did not rely on the comparative-advantage proposition as the main argument for free trade. He (Vol. 1, pp. 133–134) declares his unconditional support for free trade in the *Principles* before even introducing his new proposition when he writes the following: "Under a system of perfectly free commerce, each country naturally devotes its capital and labour to such employments as are most beneficial to each. This pursuit of individual advantage is admirably connected with the universal good of the whole. By stimulating industry, by rewarding ingenuity, and by using most efficaciously the peculiar powers bestowed by nature, it distributes labour most effectively and most economically: while, by increasing the general mass of productions, it diffuses general benefit, and binds together by one common tie of interest and intercourse, the universal society of nations throughout the civilized world. It is this principle which determines that wine shall be made in France and Portugal, that corn shall be grown in America and Poland, and that hardware and other goods shall be manufactured in England."

Furthermore, the comparative-advantage proposition is notably absent from the most important trade-policy debate in England between the years 1815 and 1846: the repeal of the Corn Laws.[6] Cheryl Schonhardt-Bailey (2006) does not even bother to mention the proposition in her detailed book on the repeal of the Corn Laws. Although the leading economists of the time argued in favor of the repeal, they did not invoke the comparative-advantage proposition to fundament their position. They preferred to make their case for free trade more in the lines of the *Wealth of Nations*, as Ricardo himself did in the *Principles*.

Ricardo's limited use of the comparative-advantage proposition prompted some scholars to wrongly claim that he did not fully understand the value of it because he had taken the insight from somebody else (Thweatt, 1976; Rothbard, 1995; Aldrich, 2004). Thweatt in particular claimed that Ricardo took the insight from his close friend and collaborator James Mill. As Ruffin (2002, p. 735) already pointed out, this claim is rather easy to refute by referring to Mill's letter to Ricardo, in which he praises his friend for the comparative-advantage proposition.

Perhaps the key reason why the comparative-advantage proposition wasn't used as the main explanation of the virtues of free trade back then is the fact that this proposition is built upon and logically intertwined with other important insights of the classical theory of international trade, first and foremost with the classical rule of specialization. This 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 cost compared to the home-production of the same amount of the imported commodities. This rule can also be reformulated in order to highlight the gains in output instead of input-savings. In that case the classical rule of specialization would stipulate that it is beneficial for a country to import commodities whenever it can obtain them in greater quantities at the same expense of labor and capital by exporting some other commodity than by producing them at home.

For Ricardo and James Mill it was absolutely clear that the real cost comparison within a country as stipulated by the classical rule of specialization is the one and only relevant cost comparison for determining the interest of a country in a certain exchange, as well as measuring the gains that accrue from it. Furthermore, both considered the real cost comparison between countries – which is the one emphasized by the comparative-advantage proposition – as irrelevant for the interest of a country in a particular exchange. Ricardo

[6] I'm indebted to Farhad Rassekh for drawing my attention to this important point.

stated this clearly in one of his *Notes on Malthus*[7], and James Mill further emphasized this crucial point in the *Elements* when he stated (1826, pp. 123-124):

> "To produce exchange, therefore, there must be two countries, and two commodities.
>
> When both countries can produce both commodities, it is not greater absolute, but greater relative, facility, that induces one of them to confine itself to the production of one of the commodities, and to import the other.
>
> When a country can either import a commodity or produce it at home, it compares the cost of producing at home with the cost of procuring from abroad; if the latter cost is less than the first, it imports. The cost at which a country can import from abroad depends, not upon the cost at which the foreign country produces the commodity, but upon what the commodity costs which it sends in exchange, compared with the cost which it must be at to produce the commodity in question, if it did not import it.
>
> If a quarter of corn is produced in England with 50 days' labour, it may be equally her interest to import corn from Poland, whether it requires, in Poland, 50 days' labour, or 60, or 40, or any other number. Her only consideration is, whether the commodity with which she can import a quarter costs her less than 50 days' labour."

One may ask then: What is the proper logical relationship between the classical rule of specialization and the comparative-advantage proposition? Robbins (1958, p. 22) considers the classical rule of specialization to be "one-half of the principle of comparative cost". This is an incorrect characterization of the logical relationship, though, because it suggests that the classical rule of specialization is somehow half-baked and incomplete with respect to the comparative-advantage proposition. The truth is that the comparative-advantage proposition is an addition to and possible implication of the classical rule of specialization, as Jacob Viner (1937, p. 441) correctly pointed out.[8]

Every voluntary commercial relationship has to be built upon the mutual interest of the participants. This mutual interest is secured by applying the classical rule of specialization to

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[7] Ricardo (Vol. 2, p. 383) stated in that note: "It can be of no consequence to America, whether the commodities she obtains in return for her own, cost Europeans much, or little labor; all she is interested in, is that they shall cost her less labor by purchasing them than by manufacturing them herself."

[8] Viner calls the classical rule of specialization the *eighteenth-century rule*, while other authors refer to it as the *gains-from-trade proposition*. Ironically, Viner's correct assessment of the logical relationship between the classical rule of specialization and the comparative-advantage proposition makes actually more sense under the new interpretation of Ricardo's four famous numbers than under Viner's wrong interpretation as unitary costs (Viner, 1937, p. 439).

all of the trading partners simultaneously but independently from each other, since each and every one of them has to be interested in the exchange. Compared to the ubiquity of the classical rule of specialization, the occasions in which the comparative-advantage proposition comes into play are far less common. This can be explained with the positive effects of the division of labor and specialization on the dexterity and productivity of individuals and countries, which makes it far less common that an individual or country might be more productive than another in the production of every commodity. Furthermore, the comparative-advantage proposition always requires the application of the classical rule of specialization for both countries, whereas the reverse is not necessary, as I have shown in a previous paper (Morales Meoqui, 2011, pp. 749-750). James Mill makes this absolutely clear in the last paragraph of the long quote above, when he explicitly states that it may be equally in the interest of England to import corn from Poland, whether the imported corn is produced there with the same (50), more (60) or less (40) amount of days' labor. All what England cares is that the amount of commodities that she has to export to Poland in order to pay for the quarter of Polish corn takes her less than 50 days' labor to produce.

In this respect it is also quite revealing the pay attention to the way in which Mill presents the comparative-advantage proposition in the *Elements*. He includes it in the section entitled "*Occasions on which it is the Interest of Nations to exchange Commodities with one another*" (1826, pp. 118-125). First Mill mentions rather obvious cases like the ones in which a country has the exclusive capacity to produce a certain commodity, or can produce it much more cheaply than others because it has an abundance of one or more factors of production necessary for its production. Then he refers to the case in which a country has superior facilities (= the power of producing the same effect with less labor) in both commodities with respect to another country. The way Mill presented it suggests that he regarded Ricardo's comparative-advantage proposition as an extension of the occasions in which international trade is considered to be mutually beneficial, as has been stated before. There is evidently no need to use the proposition in other occasions.

In addition to this close logical relationship between the comparative-advantage proposition and the classical rule of specialization, there is another important logical relationship with another proposition that should not be ignored. If one follows closely what is actually written in the *Principles*, there is little doubt that Ricardo presented the comparative-advantage proposition as a corollary[9] of the non-appliance of the labor theory of value in international transactions. As I have already shown in a previous paper (Morales Meoqui, 2011, pp. 754-755), the importance of the proposition regarding the non-appliance of the labor theory of value in international transactions can be corroborated by the fact that Ricardo could not have proven the comparative-advantage proposition if the amounts of cloth and wine traded had to be produced with the same amount of labor, which is mandatory under the labor theory of value. As further proof of its original importance, John Stuart Mill dedicated a whole section of his *Principles of Political Economy with some of their Applications to Social Philosophy* (1848) to explain it before he proceeded with a correct statement of comparative advantage in the following section.[10]

All of the above offers a plain explanation for why Ricardo referred to the comparative-advantage proposition only once and merely in passing in chapter 7 of the *Principles*, whereas he applied the classical rule of specialization not only in the famous numerical example, but also in other parts of the *Principles* as well.[11] Furthermore, it points to the conclusion that Ricardo did not consider nor use the comparative-advantage proposition as a general principle or economic law that determines the specialization of individuals and countries or the location of industries, like the neoclassical trade theory proclaims. For this purpose, as well as for calculating the gains from trade, he always used the classical rule of specialization.

Specifying the Achievement regarding Comparative Advantage

Before dipping into the analysis of who should be credited for comparative advantage, let us make a brief recapitulation of the logical interrelationships between this proposition and two other important insights mentioned in the previous section. This is necessary for appreciating more accurately what should and what shouldn't be considered as the central achievement regarding the comparative-advantage proposition.

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[9] The Oxford Dictionary defines the term corollary as a proposition that follows from (and is often appended to) one already proved, which is exactly how Ricardo presented the comparative-advantage proposition in the *Principles*.

[10] See John Stuart Mill (1963-1991, Vol. III, pp. 587-617).

[11] See, for example, Vol. 1 p. 295 and p. 319.

As already been stated, for Ricardo and James Mill comparative advantage is the proposition that a country might import a certain amount of a commodity although it could produce it internally at lower real costs than the exporting country. Ricardo provided a full proof of comparative-advantage proposition in chapter seven of the *Principles*. He presented it there as a corollary of the non-appliance of the labor theory of value in international transactions.

Furthermore, the comparative-advantage proposition is also a possible implication of the classical rule of specialization. This rule was already well known and repeatedly used in the economic literature before 1815, so neither Torrens nor Ricardo are entitled to any particular credit for it. They can only claim merit for demonstrating an important implication of this rule.

Since comparative advantage appears to be a rather counterintuitive proposition at first sight, it is always a formidable challenge to convince the skeptics. Anything short of a complete and irrefutable proof of this proposition would certainly fail to convince them. Thus, the laurels for the comparative-advantage proposition should go to the economist who first came up with a full proof of it – not to the one who merely mentioned it as a possible implication of the classical rule of specialization. Even more so since the task of proving this implication is far from being a trivial exercise, as has been revealed by the repeated errors which James Mill committed when trying to reproduce Ricardo's comparative-advantage proposition in the *Elements* (Mill, 1826, pp. 119-124).

It is now established beyond doubt that Ricardo published a full proof of the comparative-advantage proposition in the *Principles.* There is nothing missing or to be added there. For this reason, James and John Stuart Mill do not deserve any credit for the discovery of comparative advantage, and it is important to recognize once and for all that neither of them has ever claimed merit for this proposition. The only one who actually claimed credit was Torrens, although he made this claim only after Ricardo's death and later recanted it.[12]

Therefore, supporters of Torrens' claim would have to bring up a satisfactory proof of this proposition prior to 1817, the year of publication of Ricardo's *Principles*. There is indeed a

[12] De Vivo, the editor of the *Collected Works of Robert Torrens* (2000) points out that Torrens actually makes two different priority-claims: one regarding the advantages derived from trade in general based on *The Economists Refuted,* and another regarding comparative advantage in the preface of the 1826 edition of the *External Corn Trade.* De Vivo considers both claims far from convincing and hardly reconcilable with Torrens' own sweeping acknowledgments of Ricardo's priority on the theory of foreign trade. See Torrens (Vol. II, pp. xvii-xix; Vol. VI, p. xxii).

paragraph in Torrens' 1815 *Essay on the External Corn Trade* in which he mentions the possibility that England would import some amount of corn from Poland even if it had more fertile lands than the latter. Many Torrens' supporters as well as influential authors on history of economic thought like Samuel Hollander (1979, p. 461) have referred to this paragraph as the strongest evidence for the legitimacy of his claim of priority over comparative advantage. Furthermore, there can be no dispute about the fact that Torrens had already published his essay well before Ricardo arrived to the full proof of the comparative-advantage proposition, which Ruffin (2002, pp. 735-743) dates around the first two weeks of October 1816. But is this undisputed fact a sufficient reason for establishing the priority of Torrens over Ricardo as the legitimate author of the comparative-advantage proposition? It might be, but only in case that Torrens' statement contains a satisfactory proof of the comparative-advantage proposition, at least equal if not superior to Ricardo's formulation in the *Principles*. So let's analyze in greater detail the relevant paragraph in the next section.

A Precise Account of Torrens' Omissions

As has been pointed out before, Torrens' claim of authorship for the comparative-advantage proposition rests exclusively upon a single paragraph in the *Essay on the External Corn Trade* of 1815. It contains the following statement:

> "If England should have acquired such a degree of skill in manufacturing, that, with any given portion of her capital, she could prepare a quantity of cloth, for which the Polish cultivator would give a greater quantity of corn, than she [England] could, with the same portion of capital, raise from her own soil, then, tracts of her territory, though they should be equal, nay, even though they should be superior, to the lands in Poland, will be neglected; and a part of her supply of corn will be imported from that country. For, though the capital employed in cultivating at home, might bring an excess of profit, over the capital employed in cultivating abroad, yet, under the supposition, the capital which should be employed in manufacturing, would obtain a still greater excess of profit; and this greater excess of profit would determine the direction of our industry" (Torrens, Vol. 2, pp. 264-265).

He was well aware of the counterintuitive nature of this proposition, since he wrote at the beginning of the paragraph:

> "Let us suppose, that there are, in England, unreclaimed districts, from which corn might be raised at as small an expenditure of labour and capital as from the fertile plains

of Poland. [...] [It] seems natural to conclude, that if industry were left to take its most profitable direction, capital would be employed in raising corn at home, rather than in bringing it from Poland at an equal prime cost, and at a much greater expense of carriage. But this conclusion, however obvious and natural it may, at first sight, appear, might, on a closer examination, be found entirely erroneous" (Torrens, Vol. 2, pp. 263-264).

Does the above paragraph contain a satisfactory proof of the comparative-advantage proposition? So far, the main omissions in Torrens' statement already mentioned by other scholars are the following: (1) Torrens missed to make a full account of the costs of the factors of production in both countries; (2) consequently, he also failed to make the necessary cost comparisons; and (3) Torrens did not mention the key assumption of international immobility of the factors of production.[13]

Generally speaking, these previous accounts of the flaws in Torrens' 1815 statement are imprecise, as will be shown later on. Moreover, the logical connection between these flaws has been largely overseen. The incomplete nature of Torrens' proof of the comparative-advantage proposition can be explained in much greater detail and precision here thanks to a deeper understanding of the logical interrelationships between all the key elements in Ricardo's original statement: the comparative-advantage proposition itself, the classical rule of specialization and the proposition regarding the non-appliance of the labor theory of value in international exchanges. This enhanced understanding of his famous numerical example sheds a brighter light on the crucial flaws in Torrens' statement.

It is important to acknowledge right from the beginning that Torrens' example is built on a different logical construction than Ricardo's. Whereas Torrens compares the amounts of cloth and corn produced with a given quantity of capital and labor, Ricardo compares the amounts of laborers working for a year which are required to produce some unspecified quantities of cloth and wine traded. So each of them applies a different – although equally valid – version of the classical rule of specialization with its corresponding way of defining and calculating the gains from trade. In Ricardo's numerical example the gains from trade consist in the respective amounts of labor saved in England and Portugal by the exchange; in Torrens' example the gains from trade consist in the greater amount of corn that England is able to obtain with the same amount of resources by importing it from Poland rather than producing it at home.

[13] See Robbins (1958, p. 23) and Ruffin (2002, p. 733 and 2005, p. 717).

The acknowledgement of these distinctive logical constructions prevents us from incurring in the error of judging Torrens' example through the spectacles of Ricardo's four numbers. For the same reason, one should not evaluate Torrens's statement by comparing it with the neoclassical statement of comparative advantage.

Ruffin (2002, p. 733) fails to notice the different logical constructions when he echoes Robbins' claim (1958, p. 23) that Torrens missed to point out the cost ratios. If Torrens had used specific numbers in his example, though, they would have indicated some amount of output – not inputs or cost ratios. Therefore, the real issue missing in Torrens's example is not the comparison of cost ratios but the application of the classical rule of specialization for Poland. For the featured international exchange of English cloth for Polish corn to actually take place, it has to be of mutual interest for both trading partners. Thus, Torrens should have applied the classical rule of specialization not only to England but to Poland as well.

For further highlighting the incomplete nature of Torrens' statement of comparative advantage, let us represent England's exchange of a certain amount of cloth for a certain amount of Polish corn in a table. Torrens does not specify the amounts of cloth and corn that can be produced in England and Poland with a given quantity of capital and labor, so I will use the parameters Cl_E, Cl_P, Co_E and Co_P to refer to these amounts.

	Amounts of goods that can be produced with a given quantity of capital and labor in the respective countries	
	cloth	corn
England	Cl_E	Co_E
Poland	Cl_P	Co_P

Table 1: Torrens' Example

Torrens affirms that $Co_P > Co_E$, i.e. the amount of corn that England imports from Poland in exchange for its cloth is higher than the amount of corn that England could have managed to produce internally using the same amount of capital and labor currently employed in the production of the cloth exported to Poland. He does not indicate, however, whether the costs of capital and labor for producing Co_P and Cl_P in Poland are the same as for producing Cl_E and Co_E in England.

One may think that such an explicit specification of Poland's factor costs is not necessary, since the real costs of production for the amounts of English cloth and Polish corn traded have to be equal under the postulates of a real cost theory of value. But if the respective real costs of production in Poland and England were indeed the same, and Torrens indicates at the same time that $Co_P > Co_E$, then it would follow that Poland is more productive than England in the production of corn. This implication would of course contradict the whole point that Torrens is trying to make, namely that England would import corn from Poland despite being more productive that the latter in the production of this commodity.

If, on the contrary, the amounts of capital and labor embodied in the quantities of English cloth and Polish corn traded are not equal, then these commodities would have to have different exchange values under the postulates of a real cost theory of value. Since England is assumed to be more productive than Poland in the production of both cloth and corn, i.e. $Cl_E > Cl_P$ and $Co_E > Co_P$, it follows then that the English commodities would have to be produced with less real factor costs. For the same reason, the English cloth must have less exchange value than the Polish corn, unless Torrens had explicitly stated and demonstrated that the law of value does not apply to international trade, which of course he didn't.

Nowadays it is rather difficult to assess whether Torrens was aware of the theoretical difficulties of offering a satisfactory proof for the comparative-advantage proposition. What seems clear now is that he simply bypassed these theoretical difficulties by skipping the application of the classical rule of specialization for Poland, and thus avoiding any explicit reference to the factor costs in that country. This explains why Torrens had nothing to say about the non-appliance of the law of value in international exchanges, which is a crucial proposition in Ricardo's numerical example. As a consequence, he also failed to mention the critical assumption responsible for the non-appliance of the law of value in international trade: the inability of labor and capital to move from a country where productivity is low to another country with a higher level of productivity.

For economists who adhere to the neoclassical theory of value, Torrens' omissions may not seem as particularly important. According to the neoclassical theory of value, the real costs for the amounts of cloth and corn traded do not determine the relative value of these commodities, and therefore do not have to be necessarily equal. Therefore, a neoclassical economist cannot be criticized for omitting any reference to the labor theory of value in his or her demonstration of the comparative-advantage proposition. The same kind of indulgence, however, cannot be applied to a classical political economist like Torrens.

For the sake of fairness one has to admit that the majority of Torrens' supporters would presumably share the assessment that his demonstration of the comparative-advantage proposition was indeed incomplete. Their argumentation in favor of granting him the authorship over Ricardo has always rested more on the alleged flaws in Ricardo's proof of comparative advantage rather than the specific merits of Torrens' exposition. For this reason, the accurate interpretation of Ricardo's numerical example in the *Principles* is the equivalence of a knock-out punch against Torrens' claim, since it proves the allegations against Ricardo wrong while further highlighting the incomplete nature of Torrens' proof of the comparative-advantage proposition.

In resume, Torrens may deserve some amount of credit for realizing that the comparative-advantage proposition is indeed a possible implication of the classical rule of specialization. But since he did not offer a satisfactory proof of the proposition, he cannot be considered as its legitimate author nor granted precedence over Ricardo. It took the keener mind of a master logician like Ricardo's to recognize the subtleties and theoretical challenges surrounding the proof of this counterintuitive proposition. As Ruffin (2002, p. 731) correctly states: *"There is a difference between hinting at a result and providing the tools to prove a theorem."* And it has become clear now that it was Ricardo – not Torrens – who provided all the necessary tools for proving the comparative-advantage proposition.

Torrens and the Absolute Advantage Theory of Trade

Finally, it is necessary to analyze briefly the claim that Torrens was the author of the absolute advantage theory of trade (Ruffin, 2005). The approach of rejecting Torrens' authorship-claim for the comparative-advantage proposition by affirming that he actually adhered to another theory is as old as the efforts to show that his 1815 statement was flawed and incomplete. In his well-known debate with Edwin Seligman (1911) a hundred years ago, Jacob Hollander (1911) used both approaches for rejecting Torrens' claim. J. Hollander argued that with the exception of a single paragraph in Torrens' Essay of 1815, the latter adhered to the theory of "territorial division of labor".[14] Ruffin (2005) goes one step further by affirming that Torrens did not merely adhere but was actually the author and main supporter of the absolute advantage theory of trade. Ruffin's explicit purpose of attributing

[14] J. Hollander also stressed the fact that Torrens himself repeatedly recanted his authorship-claim in 1844.

this theory to Torrens is to disqualify him from claiming authorship for the comparative-advantage proposition. In essence, he argues that Torrens' claim over comparative advantage has to be rejected because of his alleged lack of consistency on the subject.[15]

Ruffin's inconsistency-charge is based of course on the presumption that the absolute cost advantage theory of trade is the precursor and main alternative to the comparative-advantage proposition. This widespread notion of incompatibility between the comparative-advantage proposition and the absolute cost advantage theory of trade, though, is actually dependent on a particular definition of the latter. It is only valid for the case in which absolute cost advantage is defined in terms of a productivity advantage or real costs, for example less amount of labor time. If by absolute cost advantage, on the contrary, one merely means a nominal cost advantage, then it would not contradict the comparative-advantage proposition at all, since a foreign manufacturer always has to have a nominal cost (and price) advantage — or a real or perceived advantage in terms of product quality — over national manufacturers in order to export commodities to another country. Otherwise, why would anybody want to import commodities of similar quality from abroad if they were not cheaper? Therefore, there is no contradiction between the comparative-advantage proposition and following statement in the *Principles*: "The motive which determines us to import a commodity, is the discovery of its relative cheapness abroad: it is the comparison of its price abroad with its price at home (Vol. 1, p. 170)."

Moreover, Ruffin's line of argumentation is unlikely to persuade those scholars who do not share his high appreciation for consistency. They will probably counter that consistency is not an indispensable requirement for deserving at least some credit for the formulation of a new concept, proposition or theory. In order to be considered as the main author of the comparative-advantage proposition, it might have been perfectly enough if Torrens had formulated an adequate proof of this proposition prior to the publication of the *Principles*.

Taking into consideration the above objections, it seems to me very unlikely that Ruffin's approach of rejecting Torrens' claim of authorship over the comparative-advantage proposition by linking him to the absolute cost advantage theory of trade will resolve the longstanding debate in favor of Ricardo. The most promising – and perhaps the only feasible

[15] Ruffin (2005, pp. 711-712) states: "Although Torrens used a phrase that fit the law of comparative advantage, he surrounded the phrase with both nonsense (as will be shown) and the main alternative to that law. This would seem to be an unlikely basis for claiming that someone discovered the scientific theory or law. As has often been said, the hard part of discovering something important is recognizing it."

– approach for rejecting Torrens' claim continues to be the one which highlights as precisely as possible the crucial shortcomings and omissions of his enunciation of the disputed proposition in the 1815 pamphlet.

Conclusions

The comparative-advantage proposition is an addition and possible implication of the classical rule of specialization. It is indeed briefly mentioned – perhaps for the first time – in a pamphlet written by Torrens two years before the publication of Ricardo's *Principles*. Although Torrens may deserve some credit for being perhaps the first to mention this possible implication of the classical rule of specialization, he cannot be considered as the legitimate author of the comparative-advantage proposition since he did not offer a satisfactory proof of it.

Torrens clearly missed to apply the classical rule of specialization for Poland in his 1815 example of English cloth being traded for Polish corn. For this featured international exchange to take place, though, there has to be gains from trade for both trading partners, not England alone. As a consequence of this omission, Torrens also failed to recognize the crucial role of the proposition about the non-appliance of the law of value in international exchanges in proving the comparative-advantage proposition, since the latter is a corollary of the former. Because of these important flaws in Torrens' statement, it is possible to reject his authorship-claim over the comparative-advantage proposition without having to take the rather tortuous and questionable approach of portraying him as the author and outspoken advocate of the absolute-advantage theory of trade.

Ricardo was unquestionably the first economist who offered a full and yet ingeniously simple proof of the comparative-advantage proposition in the famous numerical example of chapter seven of the *Principles*. He was the one who convinced his fellow political economists of the rightfulness of this proposition. Consequently, he rightly deserves the bulk of the authorship-merit – if not the whole credit – for this proposition.

It would be naive and pretentious to believe that a single paper can put an end to one of the most enduring debates in the economic science. Scholars with considerable more experience, prestige and accomplishments than myself have failed to achieve this goal, so I don't have the slightest illusion about that. I can only hope to have made a useful contribution to the authorship-debate by pointing out the logical interrelationships between all the key elements in Ricardo's original demonstration of comparative advantage, and by offering a more accurate and precise account of the crucial omissions and shortcomings in Torrens' 1815 statement.

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