# Comparative advantage and the labor theory of value

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# Comparative Advantage and the Labor Theory of Value

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## Abstract

With the famous numerical example of chapter 7 of the *Principles* David Ricardo intended to illustrate first and foremost the new proposition that his labor theory of value does not regulate the price of international transactions when the factors of production are immobile between countries. Unfortunately, later scholars have often omitted this proposition when referring to Ricardo's numerical example. Instead, they have highlighted only the comparative-advantage proposition, although Ricardo considered it as a corollary of the omitted proposition, and therefore inextricably linked to it. This inexplicable omission has led to an incomplete understanding of the logical construction of Ricardo's numerical example, as well as the misinterpretation of the four numbers as unitary labor costs. With the accurate understanding of Ricardo's numerical example and the logical relationship between the two propositions it meant to prove, it is relatively easy to refute the main objections that have been raised against the very same numerical example in the past. Moreover, it reaffirms the sustained relevance of Ricardo's two propositions as important insights for understanding the current process of economic globalization.

## Keywords

## Comparative Advantage: A Difficult Insight?

*Everything should be made as simple as possible, but not one bit simpler.*

**Albert Einstein, (attributed)**

Ricardo's famous numerical example in chapter 7 of his magnum opus *On the Principles of Political Economy and Taxation* (1817) is probably the most renowned one in the history of economic thought. The influence of this simple numerical example of merely four numbers for subsequent developments in international trade theory has been paramount. Despite its apparent simplicity, though, economists have often confronted skepticism and rejection when they had to explain the numerical example outside the narrow confines of their profession. Disturbed by the difficulty of convincing the public, they have usually put the blame on the critics and unbelievers for not being capable of understanding the allegedly *difficult* and *counterintuitive* proposition regarding comparative advantage.[2]

A different interpretation of the four numbers put forward by Ruffin (2002) suggest that much of the scepticism surrounding comparative advantage may have been caused by a careless reading of Ricardo's numerical example. With the correct interpretation of the four numbers as the quantities of labor needed to produce some unspecified amounts of wine and cloth traded by England and Portugal, much of the incomprehension associated with comparative advantage fades away. The accurate interpretation of Ricardo's numerical example does not only offer an easy way to calculate the gains of trade (Maneschi, 2004), but actually clears the way for understanding which cost comparison Ricardo considered as relevant for international specialization. Moreover, it also reveals the logical relationship between the two innovative and interlinked propositions that he wanted to illustrate with the four numbers, allowing a clear understanding of the true meaning, implications and present relevance of the numerical example and its assumptions. This is perhaps the main contribution of the present paper.

## The Accurate Interpretation of Ricardo's Numbers

The original example with the *four magic numbers* (Samuelson, 1969) can be found in a few paragraphs in the chapter entitled *On Foreign Trade* of the *Principles*. These numbers have been traditionally interpreted as the amounts of labor needed to produce a single unit of cloth and wine in England and Portugal or, in other words, as unit labor coefficients in the production of these commodities for each country. Ruffin (2002), however, convincingly argues that Ricardo's numbers are not unit labor coefficients, but rather the quantities of labor needed to produce some unspecified amounts of wine and cloth traded by England and Portugal.

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[2] Paul Krugman, the well-known international trade theorist and co-founder of the *New Trade Theory*, offers three reasons for the stubborn rejection of comparative advantage by outsiders of the economic profession: (1) the desire to be intellectually fashionable and daring, arguing against an idea that has been a sort of an icon among professional economists; (2) the real difficulty of understanding a scientific concept that is part of a dense web of linked ideas, which are familiar to economists but unknown to outsiders; (3) and the general aversion for mathematic modeling. The last point is also a recurrent accusation towards the minority of economists who have remained critical with respect to comparative advantage. See Krugman (Ricardo's Difficult Idea).

A careful review of the relevant paragraphs in the *Principles* makes it very difficult to support any other interpretation.[3] Ricardo's own wording strongly backs this interpretation, since it is consistent with the use of the terms *the cloth* and *the wine* in page 135, which refer to the *quantity of wine which she shall give in exchange for the cloth of England* mentioned in page 134. In addition, it also offers a plain explanation for why Ricardo does not specify the units of measurement for each commodity in the numerical example: such a specification is neither required nor relevant for the kind of numerical example he is presenting. All what counts is that a certain amount of English cloth is exchanged for a certain amount of Portuguese wine.

If the numbers were meant to be unit labor coefficients, then Ricardo would have missed to specify not only the units of measurement, but also the terms of trade between the two commodities. Besides these important omissions, the real labor costs indicated by him for the production of these commodities would have seem grossly exaggerated, since the work of 80 men for a whole year is a lot of labor for producing a liter or even a hectoliter of wine in Portugal.

Thus, an accurate representation of Ricardo's numerical example in a table would have to be like this:

|  | Number of men working for a year required to produce a given quantity of | |
| --- | --- | --- |
|  | cloth | wine |
| England | 100 | 120 |
| Portugal | 90 | 80 |

Table 1: Ricardo's Numerical Example

A similar table with the correct interpretation of Ricardo's numbers can be found in Sraffa (1930, p. 541). Sraffa's article had been apparently ignored in the economic literature for over 70 years before Ruffin referred to it in his paper. The Sraffian interpretation of the four numbers clears the way for understanding which cost comparison Ricardo considered relevant for international specialization, as the following section will show.

## The Classical Rule for Specialization

As stated in the precedent section, Ricardo does not build his numerical example upon unitary labor costs, but the real labor costs necessary to produce some unspecified amounts of cloth and wine traded between Portugal and England. Then, he proceeds to establish two distinct cost comparisons between the four magic numbers, each of these comparisons responding to different purposes.

The first cost comparison is between the real labor costs in the same country for the amounts of cloth and wine subject to exchange. More precisely, he compares the cost of obtaining a certain amount of a commodity from another country with the real labor costs of producing the same amount internally. The cost for obtaining these imported commodities always consists in the real labor costs embodied in the commodities that the country needs to export in order to pay for its imports.

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[3] Before reading Ruffin's paper, Maneschi wrote an entire book about comparative advantage, presenting, like many others before him, the traditional interpretation of Ricardo's example. After reading the paper, he immediately adhered to the new interpretation, calling it *"(...) the first clear interpretation of the meaning of the four magic numbers"* (Maneschi, 2004, p. 435). To verify this rather unusual conversion, see Maneschi (1998) and (2004).

By establishing this kind of cost comparison, Ricardo is merely applying what Viner has labeled as the *eighteenth-century rule*.[4] 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. According to this rule, therefore, the consumers in a country whose government follows a free trade policy would always obtain all the different commodities at the lowest possible real costs, by either producing those commodities at home or acquiring them from abroad. This constitutes the main benefit of free international trade.

The eighteenth-century rule for specialization was a long-known and often-used argument — although obviously not under the current denomination — by supporters of free trade to demonstrate the benefits of international trade well before Ricardo had written the *Principles*. Indeed, it is already present in the *Wealth of Nations* when Smith (1776) states:

> "If a foreign country can supply us with a commodity cheaper than we ourselves can make it, better buy it of them with some part of the produce of our own industry, employed in a way in which we have some advantage. The general industry of the country, being always in proportion to the capital which employs it, will not thereby be diminished, no more than that of the above-mentioned artificers; but only left to find out the way in which it can be employed with the greatest advantage. It is certainly not employed to the greatest advantage, when it is thus directed towards an object which it can buy cheaper than it can make" (IV.ii.12).[5]

Approximately a decade before the publication of Ricardo's *Principles*, James Mill and Robert Torrens had already applied this rule when writing against William Spence's Britain *Independent of Commerce* (1807), an economic pamphlet occasioned by the French blockade of Britain of 1806. Spence drew on the Physiocrats — the *economists* — to make the point that since a nation's agriculture is the source of its wealth, a blockade of trade could not hurt the British economy. Therefore, according to Spence, his fellow citizens had no reason to fear from Napoleon's Continental Blockade. To refute Spence's conclusion, both Mill and Torrens used the eighteenth-century rule to outline the benefits of international trade (Thweatt, 1976, pp. 209-212).[6]

The denomination that Viner has proposed for this cost comparison — the eighteenth-century rule — is highly misleading, because it suggests that a different rule of specialization was formulated later in the nineteenth century. That was indeed Viner's erroneous view. He believed that Ricardo had formulated the nineteenth-century rule for specialization in international commerce. Ricardo, however, did not propose an alternative rule for specialization, but applied the same rule as his predecessors. Thus, there has been only one consistent rule of specialization throughout the classical school of economic thought. Consequently, it should not be called the eighteenth-century rule, but the *classical rule for specialization*.

It is important to realize that Ricardo considers the classical rule for specialization as the relevant cost comparison for specialization, since it establishes the gains from trade for a particular country without bothering about any other cost comparison. At the first look, the mere emergence of confusion with respect to this crucial issue is somehow surprising, since Ricardo applies the classical rule for specialization in the second paragraph of page 135 to establish England's interest in importing cloth without taking into consideration Portugal's real labor costs. He proceeds then to apply the same rule for specialization to

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[4] Viner names this rule after a passage he discovered in the then anonymous *Considerations on the East-India Trade* of 1701, which is now believed to have been written by Henry Martin.

[5] Quotation from the *Wealth of Nations* will be referenced using the Glasgow convention of citing the book, chapter and paragraph.

[6] In Torrens's essay, *The Economists Refuted* (1808), there is even a quite satisfactory indication of how to measure the gains from international trade when applying the rule. He states (Torrens, Vol. VI, p. 53): "(...) *if I wish to know the extent of the advantage which arises to England, from her giving France a hundred pounds' worth of broad cloth, in exchange for a hundred pounds' worth of lace, I take the quantity of lace which England has acquired by this transaction, and compare it with the quantity which she might, at the same expense of labour and capital, have acquired by manufacturing it at home. The lace that remains, beyond what the labour and capital employed on the cloth, might have fabricated at home, is the amount of the advantage which England derives from the exchange."*

Portugal in the third paragraph. Only after he has established the interest of England in importing wine and that of Portugal in importing cloth — interests which are mutually independent —, he proceeds to compare the real labor costs between the two countries in the second part of the third paragraph.

James Mill, a close friend and collaborator of Ricardo, reaffirms with clarity the dominant cost comparison when he states in his *Elements of Political Economy* (1826, p. 123):

> "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."

Five decades later, Cairnes is only repeating Mill's statement when he writes:

> "(...) when it is said that international trade depends on the difference in the comparative, not the absolute, cost of producing commodities, the costs compared are the costs in each country of the commodities which are the subject of exchange, not the different costs of the same commodity in the exchanging countries" (Cairnes, 1967, p. 312).

However, Cairnes is severely criticized by Viner (1937) and Chipman (1965) for his correct statement of the dominant cost comparison, whereas James Mill's equivalent statement remains unchallenged. Viner (1937, p. 438f) intends to refute Cairnes by pointing out that the comparison has to be made between cost ratios, not costs, and therefore he believes that *"(...) it is unessential whether the cost ratios which are compared are the ratios between the costs of producing different commodities within the same countries or the ratios between the costs of producing the same commodities in different countries."*

Chipman (1965, p. 480) expresses the same objection in algebraic terms:

> "In other words — Cairnes seems to be saying — if among four positive quantities, the relation a'/b' < a"/b" holds, this must not be confused with the relation a'/a"<b'/b"; but as any high school student ought to know, the two inequalities are mathematically equivalent."

Both Viner and Chipman are right about the mathematical equivalence of the two inequalities, but they are mistaken by establishing a comparison of *cost ratios* in the first place. The comparison of cost ratios is a direct consequence of taking the unitary cost of the commodities as the starting point for establishing a comparative advantage in a specific commodity, since under such an unfortunate logical construction of the numerical example no other kind of cost comparison can be established in order to make a meaningful statement. The mere fact that the unitary real cost of a commodity is lower with respect to another, without explicitly establishing the rate of exchange between the two commodities, is hardly a sufficient criterion for producing the lower-cost commodity at home rather than importing it. Ricardo avoids this error by directly taking the real labor costs for the amounts of the commodities traded in the two countries, instead of the respective unitary real labor costs.

Even the most skeptical reader would have to agree with this restatement of the relevant cost comparison for international specialization if confronted with a passage in which Ricardo explicitly rejects the comparison of real costs between countries, declaring it irrelevant for the particular interest of a country in trading with another. Well, this is exactly what Ricardo does when commenting Malthus' *Principles of Political Economy*.[7] Malthus (1989, p. 428) credits as a factor contributing to the prosperity of the United States her ability to sell *"(...) raw produce, obtained with little labor, for European commodities which have cost much labor."* Referring to this phrase, Ricardo (Vol. II, p. 383) writes the following footnote:

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[7] Viner brings up this quote, as well as many other important insights, which have been very helpful for arriving to the new interpretation of Ricardo's cost comparisons. The reason why Viner failed to draw the same conclusions from them may be found in his erroneous interpretation of Ricardo's numbers as unitary labor costs. See Viner (1937, p. 445).

"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."

To further illustrate the relevancy of the internal cost comparison for international specialization let us go back to Ricardo's numerical example and introduce a single change represented in bold:

| | Number of men working for a year required to produce a given quantity of | |
| --- | --- | --- |
| | cloth | wine |
| England | 100 | 120 |
| Portugal | **110** | 80 |

Table 2: Ricardo's Modified Numerical Example

The change consists in increasing the number of Portuguese men working for a year required to produce the amount of cloth traded from 90 to 110. Such an increase amounts to revoking Portugal's real labor cost advantage in cloth with regard to England. Despite the change introduced, this international exchange would still take place, since both countries continue to be interested in it. Actually, Portugal is even more interested in the exchange under these modified conditions, since it gains the labor of 30 men instead of the 10 men in the original example.

Therefore, the relevant cost comparison for international trade is the one between home-production and importing, or the respective real costs within a country for the amounts of the two commodities traded. The erroneous interpretation of Ricardo's numbers as unitary labor costs has led to the mistake of ignoring the classical rule of specialization for defining the interest of a country in a particular international exchange.

Without diminishing the relevancy of this first cost comparison, it is important to realize that Ricardo's truly innovative propositions to classical international trade theory are contained in the second cost comparison, where he compares the real labor costs between England and Portugal. After having worked out the accurate interpretation of Ricardo's numbers and the relevant cost comparison for international specialization in the previous sections, let us now proceed to identify the new propositions he originally intended to prove with the simple numerical example.

## Ricardo's New Propositions

After applying the classical rule for specialization for England and Portugal respectively, the comparison of real costs between the two countries reveals that Portugal might import a certain amount of cloth from England although the former has a real labor cost advantage over the later in producing the amount of the commodity traded at home. Ricardo refers to this new proposition in page 135, when he states that "*this exchange might even take place, notwithstanding that the commodity imported by Portugal could be produced there with less labour than in England.*"

Every modern interpreter of comparative advantage has highlighted the above proposition. Because of the misinterpretation of Ricardo's numbers, there has been a misunderstanding regarding the role of this proposition within the numerical example. A symptomatic indication of the present state of confusion is the prolific denominations that scholars have attached to it. For some economists, it is the *law* of comparative advantage, while others regard it as a mere *rule*; a third group declares it a *theory*, whereas another group calls it a *doctrine*. The majority of scholars have used all these different denominations simultaneously without even bothering about the different meanings. This is an inappropriate practice for a science whose practitioners like to consider as the most precise branch of the social sciences.

If Ricardo's above proposition is neither a law, a rule, a principle, a theory nor a doctrine, as I am suggesting, then what is it instead? Viner is fundamentally right when considering it to be a mere addition or possible implication of the classical rule for specialization. Indeed, this rule is both compatible and indifferent with respect to real cost advantages between countries, since they are not relevant for establishing the interest of a country in international trade. That is why Ricardo refers to this proposition only once and merely in passing in chapter 7 of the *Principles*.

However, if real cost advantages between countries are irrelevant for specialization, as Ricardo himself has declared, it seems to be contradictious that he establishes such a cost comparison in the numerical example. Why does Ricardo bring it up in the first place? The answer is quite simple: because the cost comparison between countries is necessary for proving another proposition, which has been scarcely mentioned in the prolific economic literature about comparative advantage, although it is the main proposition Ricardo intended to illustrate in the numerical example. In order to bring this proposition back to light, it is necessary to continue the practice of consulting the *Principles* as the primary source for the interpretation of Ricardo's numerical example.

In the last paragraph of page 135 Ricardo writes:

> "Thus England would give the produce of the labour of 100 men, for the produce of the labour of 80. Such an exchange could not take place between the individuals of the same country. 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."

This passage is evidently connected to an earlier paragraph, where he states:

> "The quantity of wine which she shall give in exchange for the cloth of England, is not determined by the respective quantities of labour devoted to the production of each, as it would be, if both commodities were manufactured in England, or both in Portugal."

Ricardo is therefore referring not once but twice to a new proposition he has already stated some paragraphs before, namely 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"* (Vol. I, p. 133).[8]

If Ricardo's recurring references are to be taken seriously, then there is hardly a plausible option other than to conclude that the real purpose of his numerical example is to illustrate the new proposition that the law of value for domestic transactions — and therefore his labor theory of value — does not hold for international exchanges. Hence, one cannot rely on the labor theory of value as a valid guide for the determination of international prices under the condition of immobility of the factors of production.

A book often functions like a mirror: it only let the reader understand and appreciate what he or she already has inside his/her own mind. Therefore, many scholars have mistakenly interpreted Ricardo's numerical example as the enunciation of a new principle or law leading to free trade, which is certainly not the case. Ricardo himself never claimed to have discovered a new principle or law called *comparative costs* or *comparative advantage*. Although he mentions the word *principle* in the paragraph immediately following the announcement of the proposition, it is necessary, again, to read the whole paragraph in order to interpret Ricardo correctly. He states:

> "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

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[8] Aldrich (2004, p. 385) considers this sentence rightly as the beginning of the *comparative-advantage section*.

shall be grown in America and Poland, and that hardware and other goods shall be manufactured in England"
(Vol. I, pp. 133-134; emphasis added).

With *this principle*, Ricardo is referring of course to the *system of perfectly free commerce* at the beginning of the paragraph — not to a new principle that he would introduce afterwards.[9] According to Ricardo's exposition, the observance of the principle of free trade would naturally lead to a certain degree of specialization among nations, which is mutually beneficial since it would turn each nation more productive than without such an exchange.

Ricardo does not consider his new proposition to be a new economic principle or law, because his claim is a negation (Aldrich, 2004, p. 388). As already stated, all what he intends to back up with the simple numerical example is that the law of value *does not* regulate international prices. Does he elaborate a new rule for price-determination in international transactions? Yes, he does. Aldrich (2004, p. 388) spots the rule in chapter XXVIII of the *Principles*, *On the Comparative Value of Gold, Corn and Labour in Rich and Poor Countries* (Vol. I, p. 375), when Ricardo states:

> "(…) the natural price [the money cost of production] of commodities in the exporting country (…) ultimately regulates the prices at which they shall be sold (…) in the importing country."

But after taking a closer look at chapter seven of the *Principles*, it appears to me that Ricardo already establishes this rule for the determination of prices in international transactions right after the numerical example when he states that *"(…) cloth cannot be imported into Portugal, unless it sell there for more gold than it cost in the country from which it was imported; and wine cannot be imported into England, unless it will sell for more there than it cost in Portugal"* (Vol. I, p. 137). Then, he applies this rule rather consistently to the monetary analysis following an improvement in English winemaking that has made the existing trade unprofitable (Vol. I, pp. 137-42).

Even without conceding to Ricardo's new proposition the rank of an economic law or principle, the insight about the non-appliance of the law of value in international trade under the assumption of factor immobility between countries renders an invaluable service for the free trade theory. It explains why higher real labor costs in less productive countries do not command higher nominal prices for their exported commodities in international markets. Although poorer countries usually have higher real labor costs compared to richer countries in the production of almost every commodity, because their labor force is in general less productive, they have, for the same reason, inferior nominal — i.e. money — costs in the production of these commodities due to the low level of salaries. This lack of correspondence between real and nominal — monetary — costs of production between countries can be easily explained by the non-appliance of the law of value in international trade under the assumption of immobility of the labor force.

It is also important to emphasize the close relationship between the two propositions. Without the proposition regarding the law of value, the affirmation that countries do not need to have an absolute real labor cost advantage in a particular commodity — or the exclusive capacity to produce it — in order to participate in international trade would seem not only counterintuitive, but also in contradiction with Ricardo's labor theory of value. Let us explain this crucial point with the help of a numerical example that is in accordance with the labor theory of value:

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[9] Here I disagree with Ruffin (2002, pp. 741-742), who believes that Ricardo would announce the principle later. Ruffin also repeatedly refers to the *law* of comparative advantage.

| | Number of men working for a year required to produce a given quantity of | |
|---|---|---|
| | cloth | wine |
| England | 80 | 120 |
| Portugal | 90 | 80 |

Table 3: Numerical Example in Accordance with the Law of Value

In the above numerical example, the quantity of men needed to produce the cloth in England has been reduced from 100 to 80 men, so that the amounts of English cloth and Portuguese wine currently exchanged are produced with the same quantity of labor in their respective country, which is a mandatory condition under the labor theory of value. For Portugal to remain interested in importing cloth from England, the quantity of labor needed to produce the cloth at home has to be higher than 80 men, the quantity necessary to produce the wine. Otherwise, the country would be better off with the home-production of cloth. However, if Portugal's quantity of labor for producing the cloth at home is indeed above 80 men, then it loses the real labor cost advantage in cloth with respect to England. Therefore, the initial proposition about the non-appliance of the law of value between countries is indeed critical for the logical construction of Ricardo's numerical example, and for proving the second proposition that a country would import a commodity despite having a real cost advantage over the exporting country. The second proposition is a corollary of the former.

Before Ricardo's two innovative propositions many political economists believed that all commodities would necessarily tend to be produced in the locations where their real costs of production were lowest; if a country had the lowest real labor costs in producing all kind of commodities, it would, therefore, have no interest in engaging in international trade at all. Ricardo's proposition about the law of value refutes these previously prevalent opinions, further strengthening the main implication of the classical rule of specialization, i.e. that every country, no matter how rich or poor it might be, has the chance to participate, under favorable terms, in international trade, because it becomes more productive.

With the accurate understanding of Ricardo's innovative propositions in mind, it is possible to prove that the critical objections raised against the numerical example are baseless. They should be considered as a by-product and reliable indicator of the critics' misunderstanding of the numerical example.

## Some Charges against Ricardo Refuted

*The Logical Structure of Ricardo's Statement*

Ricardo has been repeatedly accused of carelessness and logical inconsistency in the formulation of his famous numerical example. Chipman (1965, p. 480), in particular, criticizes him for announcing the terms of trade relatively late in the exposition of the numerical example, and without explaining its determination.

The accusation of logical inconsistency is routed, of course, in the erroneous interpretation of Ricardo's numbers as unitary labor costs. The accurate interpretation of the numbers rescue him — the *master logician of political economy* (Maneschi, 2004, p. 435) — from any charge of logical inconsistency and carelessness. By stipulating that certain quantities of wine and cloth are currently exchanged between Portugal and England, Ricardo actually begins with the terms of trade. Then he goes on to specify the amount of labor needed to produce these quantities in both countries, so that each trading partner gains from trade and therefore has an interest in pursuing the exchange. The fact that England uses 100 men to produce the cloth she needs to export in order to pay for the imported wine, whereas she would need 120 men to produce the same quantity of wine at home, immediately establishes her interest in importing wine without requiring any knowledge of Portugal's labor inputs. Likewise, Portugal's interest in importing cloth is established by her

requiring 80 men to produce enough wine to pay for the cloth that she would otherwise produce at home with the labor of 90 men.

Ricardo's approach to build his numerical example on an international exchange that is already taking place between Portugal and England is consistent with the main purpose of any international trade theory: to explain the current pattern of international trade. In addition to this, as Ruffin (2002, p. 742) correctly points out, the logical structure followed by Ricardo is valid for any number of commodities and countries.

*The Gains from Trade according to Ricardo*

The foremost reason for rejecting Ricardo's formulation of comparative advantage is that he supposedly fails to specify the gains from trade and the proportion in which these gains are divided between the countries participating in the exchange. John Stuart Mill raised this critical point for the first time — although in a very respectful and apologetic way towards Ricardo —, in his *Essays on Some Unsettled Questions of Political Economy* of 1844. This alleged failure by Ricardo is a recurrent reference for many of his critics.

However, it is important to realize that John S. Mill takes as basis for his remark the numerical example contained in the *Elements*, his father's textbook, and not Ricardo's numerical example in the *Principles*, actually creating the precedent of interpreting and correcting Ricardo based on James Mill's example.[10] With the accurate interpretation of Ricardo's numerical example, it is easy to prove that Ricardo did not commit any omission. He indicates rather precisely the gains from trade for each country — unlike the imprecise speculations about the division of these gains between the two countries in what contemporary textbooks refer to as the *Ricardian model*. They are the result of a simple subtraction. For England (Portugal), the gains from trade are given by the difference between the number of men, 100 (80), she currently employs to produce the quantity of cloth (wine) exported to pay for the importation of wine (cloth), and the number of men she would need, 120 (90), to produce the wine (cloth) internally. England saves the labor of 20 men, whereas Portugal saves the labor 10 men. The additional quantity of commodities or services that these men could produce would be the gains from trade in terms of an increase in the amount of commodities and services available. Thus, in the same breath, Ricardo informs his readers not only about the pattern of trade, but also about each country's gains from trade (Maneschi, 2004, p. 436).

It has been interpreted as a curious fact or perhaps even as an extravagancy by Ricardo that, writing in the heyday of England's industrial revolution, he decided to formulate his numerical example selecting Portugal as the superior nation in the production of both commodities. Samuelson (1969, p. 5) explains this odd economic geography with Ricardo's desire to prove his readers that a foreign country could not undersell England in everything even if the former is more productive in producing every commodity. Probably, but in addition to this explanation it is also plausible that Ricardo wanted to present England as the greater beneficiary of this exchange despite having an absolute real cost disadvantage in both commodities, since she would save more labor than Portugal.

*The Constant-Labor-Costs Assumption*

In addition to the increased complexity when calculating the gains from trade, the erroneous interpretation of Ricardo's numbers as unitary labor costs has also led to the introduction of the assumption of constant labor costs. With the past of time, this assumption has even turned into an identifying feature of Ricardo's international trade theory.

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[10] Sraffa (1930, pp. 541-542) indicates a plausible explanation for J. S. Mill's flaw when pointing out that perhaps he "(…) thought that his father had followed Ricardo so closely and faithfully, that anything which the former had said in the *Elements* could safely be attributed to the later."

The constant-labor-costs assumption has been rightfully regarded as the most unrealistic feature of the *Ricardian model* of contemporary textbooks. It is indeed an unreasonable assumption for any kind of trade model, since the greatest benefit of trading commodities and services consists in the encouragement of specialization and mass production, which necessarily lead to gains in labor productivity, increasing returns to scale and decreasing labor costs per unit. These beneficial effects could be largely increased by engaging in commerce at an international scale because of the greater extension of the market. Therefore, it is perfectly understandable that any economist who builds up his case in favor of international free trade on a theoretic trade model that leaves precisely these benefits out will inevitably fail to convince anybody.

Having said this, I could not find in chapter seven of the *Principles* — or somewhere else in this book — any explicit or implicit reference to constant labor costs in connection with international trade. This assumption made its entrance into international trade theory by the backdoor, being James Mill, not Ricardo, the one who let it in by formulating his explanation of comparative advantage in the *Elements* with unitary labor costs. Because of the fact that countries usually trade more than a single unit of a commodity, later economists have assumed that the unitary costs indicated remain constant. Moreover, since it was mostly from Mill's textbook and J. S. Mill's later remarks that later generations of economists have learned Ricardo's comparative advantage example, the constant cost assumption finally became the standard feature of the *Ricardian model* of today's textbooks.

Aldrich (2004, p. 382) is apparently aware that the true origin of the constant labor cost assumption is James Mill's example and not Ricardo's. Nevertheless, he affirms a few pages later that in Ricardo's example "(...) *trade between Portugal and England would not take place if English and Portuguese labor had to exchange at parity; if, say, England's cloth consignment were reduced by one-fifth so that its labor content equaled that of Portugal's wine consignment, Portugal would withdraw from the trade. Ricardo does not draw this conclusion, but perhaps he thought the reader would*" (Aldrich, 2004, p. 388).

Ricardo does not draw the above conclusion, and neither should the reader, because it is only valid under the constant-cost assumption. In order to Portugal to withdraw from the exchange under this modified terms of trade, her real labor costs for the new quantity of cloth traded should be equal or below 80 men, the labor costs for the quantity of wine she needs to export in order to pay for the importation of cloth. If Portugal's real labor costs for producing the cloth at home are also reduced by a fifth ($90 - 18 = 72$ men), she would certainly retreat from this unfavorable trade, but such a proportional cost reduction implies the assumption of constant labor costs. Ricardo never made such an assumption.[11]

The reinterpretation of Ricardo numerical example necessarily leads to the dismissal of the constant-labor-cost assumption as a dominant feature of the classical theory of international trade. This has far-reaching consequences for the case in favor of free trade. Economies of scale, formerly banned from Ricardo's comparative-advantage insight due to the presence of the constant-labor-costs assumption, now can be easily integrated. Critical points directly raised against the dismissed assumption, like the well-known *Graham's Paradox*[12], all of a sudden become irrelevant with regard to Ricardo's original statement of comparative advantage, although it remains a valid critic for the *Ricardian model* of contemporary textbooks.

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[11] If Portugal needs more than 80 men for producing the new quantity of cloth traded, she would loose her real labor cost advantage in cloth with respect to England, but she would still be interested in the exchange.
[12] See Graham (1923).

*The Assumption of Immobility of the Factors of Production*

Another prominent feature of Ricardo's international trade theory is the assumption of international immobility of the factors of production. This assumption, unlike to one proclaiming constant labor costs, is indeed necessary for the validity of Ricardo's propositions. Ricardo himself is very much aware of it, since he devotes an important part of his exposition to it.[13]

Critics of free trade have repeatedly stated that the assumption of immobility of the factors of production — at least as far as the factor capital is concerned —, is not valid for the contemporary world economy anymore. Today, no one would seriously dispute the fact that capital is indeed more mobile than in Ricardo's times. With a simple click on a computer mouse, immense amounts of capital can be transferred at incredible speed from one end of the world to the other. Therefore, the critics argue, any conclusion gained from a theoretic model that uses such an unrealistic assumption should be dismissed because of the model's lack of correspondence with economic reality.

Let us assume for a moment that there is indeed unrestricted mobility of the factors of production in the present world economy. Ricardo explicitly analyzes this possibility in page 136 of the *Principles*. In this case, the labor theory of value would regulate the relative value of commodities in international transactions as well. Consequently, commodities would be produced in locations throughout the world where the real labor costs are lowest. Labor and capital owners would migrate to these locations in order to earn higher real incomes and enjoy the highest possible standard of living. Ricardo's two propositions would not hold anymore, but the case in favor of free international trade would remain essentially untouched.

Now, should we really consider Ricardo's assumption of international immobility of labor as unrealistic in the context of the present world economy? Unquestionably, today's labor force is more mobile compared to the first decades of the nineteenth century. However, the billions of inhabitants currently living in developing countries cannot migrate to the developed countries to earn higher salaries and enjoy a better standard of living. Strict immigration laws — which have been turned even more restrictive in recent years —, effectively limit the legal — and try to prevent the illegal — immigration from poor to rich nations. Even within the European Union, which grants the citizens of its member states the right to access the labor market of any other member state[14], the labor force show very little disposition to move to another country to seek employment or higher salaries. So today's world economy can be regarded as an economic system with only partial mobility of factors of production: capital is increasingly mobile between countries, but the mobility of labor is still artificially restricted.

The unrelenting validity and importance of Ricardo's two propositions for the present process of economic globalization becomes evident when applying them to what has been mostly perceived as a growing threat in the developed world in recent years: the emergence of China and India as active players in the world economy. It has been said that these two countries could soon undersell the developed countries in the production of every commodity because of their lower nominal labor costs and vast human resources. However, these inferior nominal labor costs are the result of the meager nominal salaries prevailing in these countries, which are the direct consequence of a low level of productivity of the labor force and its inability to emigrate to countries with higher productivity. Therefore, both China and India have higher (!) real labor costs compared to the developed countries, which is exactly the situation of England in Ricardo's numerical example. Nowadays, as well as in Ricardo's time, every nation is interested in trading freely with the rest of

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[13] Ruffin (2002, p. 734) calculates that from the 973 words Ricardo devoted to explain his insight, he employed 485 to emphasize the importance of factor immobility!

[14] Citizens of the new member states in Central and Eastern Europe are actually banned — although on a temporary basis — to seek employment in countries like Austria and Germany.

the world in order to specialize in certain areas according to its comparative advantage, and to become more productive so that their citizens can consume more commodities and enjoy a higher standard of living.

## Conclusions

*"Classic". A book which people praise and don't read.*

**Mark Twain**

The frequent omission of the proposition regarding the non-appliance of the law of value in international transactions has led to an incomplete understanding of Ricardo's numerical example that was meant to illustrate it. Consequently, the well-known corollary of this omitted proposition, namely, that a country might import a certain amount of a commodity despite having a real cost advantage in producing the same amount of the commodity with respect to the exporting country, has been wrongly viewed as an economic law or principle that leads to free trade. The case for free trade, however, is not based on the comparison of costs or cost ratios between countries, but on the comparison of real costs within a country for the commodities traded, or to put it differently, between home production and importation. According to the classical rule of specialization, it is beneficial for a country to import commodities whenever they can be bought with other commodities whose production entails less real costs compared to the home-production of the imported commodities.

The misinterpretation of the four numbers in the numerical example as unitary labor costs has led to the incorrect assumption of constant returns to scale. This assumption is completely inappropriate for any theoretical model of international trade, because the main benefit of international trade consists in increasing the productivity of labor, which is incompatible with constant-returns-to-scale assumption.

Ricardo's two innovative propositions remain valid in the contemporary economic system because labor continues to be essentially immobile at a global scale. It can be seen as an example for the continued relevance of classical political economy as a valid and useful conceptual framework for analyzing the actual problems and challenges of the current process of economic globalization.

Finally, the new interpretation of Ricardo's numerical example highlights the importance of consulting the primary source for the understanding of a concept or theory. The reliance on secondary sources, whatever valuable and prestigious they might have been considered, always bears the danger of perpetuating the potential misinterpretation of the original thinker by the authors of these secondary sources. This danger increases considerably when the researcher decides to rely rather exclusively on secondary sources to arrive to his/her conclusions. By following this approach, generations of scholars unconsciously reproduce and perpetuate the possible distortions and errors made by earlier interpreters of the original thinker, as has been the case with Ricardo's famous numerical example.

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