

Ricardo's Theory of Value and International Trade: On the Invalidity of the Alleged 'Labour Theory of Value'*

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Abstract:

This paper presents a new interpretation of Ricardo's international trade theory. It shows that Ricardo's value theory in his *Principles* can be understood exclusively as the cost-of-production theory of value, which integrates the domestic value theory and international value theory, requisitely taking into consideration changes in the value of money when it is applied to the analysis of international exchange.

In Section II, we critically re-examine the standard interpretation of Ricardo's trade theory in the so-called 'Ricardian Model' in textbooks today. Based on the concepts of 'comparative advantage' and 'gains from trade' within the two-country two-commodity framework, we show that it is a distorted interpretation, which originated from J. S. Mill's arguments and established through the debate between Viner and Haberler, in the opposite direction of Ricardo's original value theory. In Section III, we present that Ricardo consistently adopted the cost-of-production theory of value, which is valid not only for domestic, but also international, exchange based on the concept of natural price, with the so-called 'labour theory of value' being merely a subset rule in the analysis of domestic exchange. We then show that Ricardo's original value theory inevitably takes into consideration the differences and adjustments in the value of money in international exchange, in the analysis of international exchange. Finally, we will briefly review that Ricardo was heading in the right direction towards today's theory of international trade including intermediate goods.

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I Introduction

Found in Chapter 7 of David Ricardo's *Principles*, the following well-known observation is quite often referred to as the issue of the 'invalidity of the labour

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theory of value' in international exchange:

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. (*Works* I, 133)¹

However, there are some serious questions raised around the simple statement of the 'invalidity of the labour theory of value': Is it true that Ricardo adopted the labour theory of value in analysing domestic exchange? Did Ricardo abandon his value theory in his analysis of international trade? Was Ricardo really not able to conceive the theory of international values? Was John Stuart Mill's argument that it is necessary to convert to the 'principle of demand and supply' due to inapplicability of the Ricardian value theory to international exchange correct?

These questions are closely related to each other. This paper's goal is to answer them and present Ricardo's true aims in his value theory, showing that the adherence to the 'four numbers' since J. S. Mill's argument has deformed Ricardo's theory into the so-called 'Ricardian Model.' Ricardo in fact thought that in international exchange, the money price tends to the natural price of the exporting country and, therefore, it was unnecessary for J. S. Mill to convert to the demand–supply theory of value. Ricardo's theory of value was consistently the cost-of-production theory of value, not the labour theory of value, and it is valid both, in domestic and international exchange. Lastly, Ricardo's theory of international values inevitably involves the analysis of monetary adjustments.

This study profoundly depends on previous research, among which Faccarello ([2015] 2017) and Takenaga (2000) are particularly notable, as mentioned later.

This study is also inspired by Shiozawa's (2014; 2017a; 2017b; 2017c) research. He demonstrated that in a Ricardo–Sraffa trade economy—that is, an M-country, N-commodity trade economy in which intermediate goods are traded and the choice of techniques are explicitly incorporated—the international values v (i.e. wage vector $w: w_1, w_2, \dots, w_M$; price vector $p: p_1, p_2, \dots, p_N$) are uniquely determined in general cases; thus, Shiozawa established a new theory of international values where the principle of comparative advantage has no role in explaining international trade. According to Shiozawa, Ricardo himself failed to establish a theory of international values based on the classical value theory, leading to J. S. Mill's solution of the theory of reciprocal demand based on sup-

1 All references to Ricardo's writings are to the 1951–1973 Sraffa edition in the following format: *Works*, volume, page.

ply-and-demand relationships, which caused the departure from the economics of production, or *plutology*, and paved the way for the long tradition of neoclassical economics of exchange, or *catallactics*.

It will be shown that Ricardo's value theory was originally oriented to answer the problems that Shiozawa raised and resolved.

II Starting Point: The Standard versus New Interpretations of Chapter 7 of Ricardo's *Principles*²

1. The 'Sraffa–Ruffin Interpretation' and Yukizawa on the 'Four Numbers'

Several recent publications (e.g. Ruffin 2002, 2005; Maneschi 2004) have provided the true meaning of the famous 'four magic numbers' (Samuelson [1969] 1972) in Chapter 7 of the *Principles*. According to Ruffin (2002), Sraffa (1930) also understood their true meaning; thus, the new interpretation was named the 'Sraffa–Ruffin interpretation' by Andrea Maneschi. The essence of the new interpretation is as follows: the four numbers are not unit labour coefficients in the production of wine and cloth in England and Portugal, but a representation of the labour needed to produce the amounts of wine and cloth actually traded. Each country's gains from trade are simply given by the difference between the two numbers without the need of any knowledge of the other country's labour inputs.

As early as the 1970s, Japanese Marxian economist Kenzo Yukizawa presented an interpretation essentially identical to Ruffin's (Yukizawa [1974] 1988; 1978; Tabuchi 2006; 2017b). Yukizawa criticised the standard interpretation as a 'distorted interpretation' derived from John Stuart Mill ([1844] 1967; [1848] 1965) and insisted that Ricardo's theory of comparative costs should be understood '*as it was*,' in the same way as in Ricardo's original logic.

Table 1 True Meaning of Ricardo's Four Numbers

	X units of cloth (men/year)	Y units of wine (men/year)	Gains from Trade
England	100	120	20
Portugal	90	80	10

2. The Reconstruction of Ricardo's Theory by James and John Stuart Mill

Interestingly, both Yukizawa and Ruffin believed J. S. Mill shaped the standard

² I discuss roughly the same issues in more detail in Tabuchi (2006, Chapters 3–5; 2017a; 2017b).

interpretation. Ruffin claimed the following:

John Stuart Mill was responsible for the rational reconstruction of Ricardo in which the labor cost coefficients were interpreted as the amounts used in a unit of each good produced rather than Ricardo's labor cost of producing the amounts contained in a typical trading bundle.

(Ruffin 2002, 742–43)³

Indeed, it was J. S. Mill who redefined the meaning of the 'four numbers' as unit labour requirements to show autarky prices, thus establishing the theory of 'reciprocal demand' to complement a theory of terms of trade determination, which, he thought, Ricardo's trade theory lacked.

However, the following aspects are far more important than the redefinition of the 'four numbers' in James and J. S. Mill's reconstruction of Ricardo's theory are⁴:

1. James Mill confined Ricardo's theory of international trade to the narrow framework of the two-country two-commodity model:⁵ 'To produce exchange, therefore, there must be two countries, and two commodities' (J. Mill [1826] 1992, 123).
2. J. S. Mill, based on James Mill's framework,⁶ focused solely on the 'Laws of

3 However, a close look at James and John Stuart Mill's discussions of the comparative costs examples reveals that it is not clear that they did not understand the original meaning of Ricardo's four numbers. Indeed, James Mill's statement in the 'Colony' article (J. Mill [1818] 1989) certainly shows that he understood Ricardo's original presentation of the four numbers almost perfectly. It is not known whether J. S. Mill read the article (Tabuchi 2006, Chapter 4; 2017b).

4 The reconstruction of Ricardo's theory and the adherence to the 'four numbers' by J. S. Mill and subsequent theorists, such as Viner, Haberler and Samuelson, may have been influenced by Robert Torrens' own explanations of comparative advantage and his repeated claims to 'priority.' This is a notable and attractive hypothesis. See Hisamatsu (2016) and Tabuchi and Hisamatsu (2018).

5 Ricardo did not employ the two-country two-commodity framework. In the 'theory of comparative costs' section in Chapter 7 of the *Principles*, he devoted attention to the exchanges outside of the ones between England's cloth and Portugal's wine: 'and in every other case' (*Works* I, 136).

6 In the first essay of the *Unsettled Questions* (J. S. Mill [1844] 1967), written in 1829–1830, and in his *Principles* (J. S. Mill [1848] 1965), J. S. Mill quoted almost all major numerical examples from James Mill's *Elements* (J. Mill 1821; 1824; [1826] 1992). In the former, J. S. Mill criticised the errors in the first and second edition of the *Elements* as 'Ricardo's error' (Sraffa 1930). James Mill corrected them in the third edition. See also Tabuchi (2006, Chapter 4).

Interchange between Nations; and the Distribution of the Gains of Commerce among Countries'⁷ in building his international trade theory.

3. In the two-country two-commodity framework, J. S. Mill provided the concept of 'International Values,'⁸ which is distinguished from domestic values, and thus he established the pattern of thinking that identifies 'international values' with 'terms of trade.'⁹
4. J. S. Mill converted to the demand–supply theory of value on the ground that in international exchanges, '[t]he principle, that value is proportional to cost of production, being consequently inapplicable, we must revert to a principle anterior to that of cost of production, and from which this last flows as a consequence,—namely, the principle of demand and supply.' (Mill [1844] 1967, 237; Mill [1848] 1965, III, 596).

In short, following James and John Stuart Mill, the analytical framework and pattern of thinking of the Ricardian theory of international trade came to encompass the following: the two-country two-commodity framework; trade between two countries; international values identified with terms of trade; and terms of trade determined by the demand–supply theory of value.

It was this framework and pattern of thinking, rather than misinterpretation of the 'four numbers,' that 'became an engine of analysis for generations to come and the starting point for all further developments in trade theory' (Ruffin 2002, 742).

3. The Standard Interpretation Established by Viner and Haberler

However, it was Viner and Haberler who were responsible for misunderstanding Ricardo's original theory and confusing it with J. S. Mill's exposition.¹⁰ This resulted in Haberler ([1930] 1985; 1933; 1936) and Viner ([1937] 1955) establishing the standard interpretation of the four numbers as follows:

⁷ See the title of J. S. Mill's the first paper of the Unsettled Questions.

⁸ The title of Chapter 18, Book III of J. S. Mill's *Principles* (J. S. Mill [1848] 1965).

⁹ In Notes on Malthus, Ricardo admitted that he did not know how a nation could improve in terms of trade: 'It is undoubtedly true that if a country is to pay a certain money price for foreign necessaries and conveniences, it is for its interest to sell the commodity which it exports at a high, rather than at a low price; it is desirable that for a given quantity of its own commodity, it should obtain a large rather than a small quantity of foreign commodities in return, but in what way a nation can so regulate its affairs as to accomplish this by any means which it is in its power to adopt, I am totally at a loss to conceive' (*Works* II, 146). However, it should not be interpreted as evidence that Ricardo lacked a theory of terms of trade determination. Ricardo developed his theory of (international) values in an entirely different way. See section III.

¹⁰ See also Tabuchi (2006, Chapter 5; 2017a).

In chapter VII of his *Principles* he gives the following celebrated example: In England a unit of cloth costs 100 and a unit of wine 120 units of labour; in Portugal a unit of cloth costs 90 and a unit of wine 80 units of labour.

(Haberler 1933, 98; 1936, 128)

Table 2 Viner's Standard Interpretation

Amount of labour required for producing <i>a unit of</i>		
	Cloth	Wine
England	100	120
Portugal	90	80

Viner ([1937] 1955, 445), emphasis added.

Viner and Haberler were rivals but shared the conception that Ricardo's theory of comparative costs was based on the labour theory of value. They insisted on subtracting the labour theory of value from the doctrine of comparative costs and replacing it with their own value theories, namely, Viner's real cost theory and Haberler's opportunity cost theory:

[T]he labor-cost theory of value could find few, if any, serious defenders today, and many writers have claimed either that the doctrine of comparative costs must be rejected because of its dependence on a labor-cost theory of value, or else that it must be restated in terms of "modern" value theory without reference to labor-costs. . . . The association of the comparative-cost doctrine with the labor-cost theory of value is a historical accident, a result merely of the fact that Ricardo, in his pioneer exposition of it, expressed real costs in terms of quantities of labor.

(Viner [1937] 1955, 489–90)

Whereas Viner, in the end, failed to find a unit with which to measure the subjective costs of labour and capital, Haberler eliminated the labour theory of value from the doctrine of comparative costs in a more elegant way, by introducing the substitution curve based on the Austrian opportunity cost theory of value (Haberler [1930] 1985, 1933, 1936). He insisted that 'this latter doctrine [the labour theory of value] holds good, as a special case of the general theory, if there is only one factor of production: homogeneous labour' (Haberler 1936, 175). He continued:

It is now obvious that we have no further need of the Labor Theory of Value. We can derive the conditions of substitution between the two commodities, and express them in the form of a substitution-curve, when many different factors of production are available. (Haberler 1936, 177)

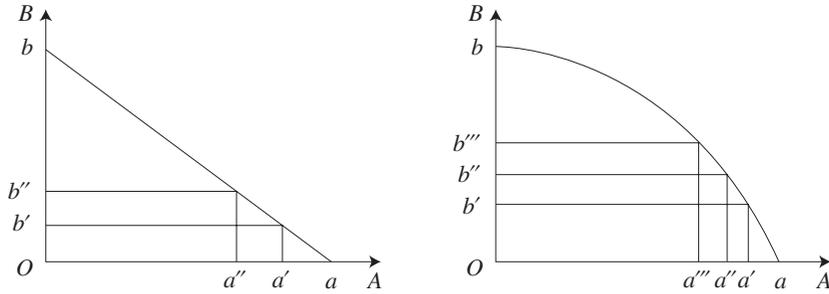


Fig. 1 Haberler's Elimination of Labour Theory of Value from the Doctrine of Comparative Costs (Haberler 1936, 176)

The substitution curve is now called the ‘transformation curve’ or the ‘production possibility frontier.’ It is so popular that essentially identical diagrams appear in virtually all textbooks on the theory of international trade. Haberler’s presentation was the first exposition of the ‘Ricardian Model,’ positioning it as a ‘special case’ of the more general case of the concave production-possibility frontier with multiple factors.

4. Faccarello’s Reading

Another epoch-making and far-reaching insight into Ricardo’s theory of international trade appeared more recently (Faccarello 2015 a; 2015 b; [2015] 2017). Faccarello criticises Ruffin, Maneschi and the subsequent literature for focusing on only a few pages (about 15%) of Chapter 7 of the *Principles* and sticking to the neoclassical approach in *real* terms. According to Faccarello, Ricardo’s work is like a jigsaw puzzle: no part can be analysed independently of the rest of the work. Through a careful reading of all of Chapter 7 (especially the discussion on money), the *Principles* as a whole and other writings by Ricardo, Faccarello draws three conclusions (among other important insights):¹¹

1. For Ricardo, there are no significant differences between domestic and international exchanges. Although Ricardo’s analysis may seem to occur at the macro level, individuals, not countries, are the agents of trade and every exchange is monetary. There are no specific international prices: in both domestic and international trade, micro-agents act in their self-interest and the

11 Faccarello’s seminars on Ricardo’s theory of international trade, held at Tokyo University on March 23, 2016, and at Doshisha University on April 9, 2016, were also helpful on these points.

- prices they pay tend to be natural prices.
2. Thus, a country's 'gains from trade' are just an *unintended consequence* of the dynamics of individual agents in a competitive market and the 'principle of comparative advantage' does not explain the flows of trade. Ricardo never used the phrase 'comparative advantage' in explaining international trade.¹²
 3. The characteristics of an international equilibrium and the nature and impact of destabilising shocks are analysed and, through changes in the distribution of precious metals, these shocks cause the value of money to differ among countries.

Faccarello's reading urges a radical review of the history of the international trade theory since Ricardo and, above all, has the potential to demolish the analytical framework and pattern of thinking of 'Ricardian' international trade theory since J. S. Mill.

Faccarello based his first conclusion in part on the following passage from the *Principles* stating that the money price tends to be the natural price of the exporting country:

Corn, like every other commodity, has in every country its natural price, viz. that price which is necessary to its production, and without which it could not be cultivated: it is this price which governs its market price, and which determines the expediency of exporting it to foreign countries. . . . *All that I contend for is, that it is the natural price of commodities in the exporting country, which ultimately regulates the prices at which they shall be sold, if they are not the objects of monopoly, in the importing country.*

(*Works* I, 374–75, emphasis added)

5. Ricardo's Natural Price and Mill's Unnecessary Conversion to the Demand–Supply Theory

To amplify Faccarello's argument,¹³ we put forth the following:

12 In the first paragraph of Chapter 19 of the *Principles*, Ricardo wrote, 'A new tax too may destroy the comparative advantage which a country possessed in the manufacture of a particular commodity' (*Works* I, 263). Here is another example of use: 'the question of the comparative advantage of employing capital in agriculture or on manufacture' (*Works* VII, 26–27, Letter to Malthus on June 24, 1818). However, it appears Ricardo meant 'relative' when he used 'comparative.' Therefore, we judge from the context that these examples refer to the so-called 'absolute advantage.'

13 Faccarello suggests: 'Contrary to J. S. Mill's approach, Ricardo's reasoning is straightforward' (Faccarello 2015 a, 76).

As Ricardo stated above, if every commodity, not only in domestic, but also international exchange, sells at its natural price in the producing country, it follows that because '[n]atural price is only another name of cost of production' (*Works* II, 46), it was *unnecessary* for J. S. Mill to convert to the demand–supply theory of value.

As stated in Faccarello's second conclusion, 'gains from trade,' as depicted in Chapter 7 of the *Principles* as an 'increase [of] the mass of commodities' (*Works* I, 128) or saving of labour, are only consequences of the activities of micro-agents; thus, the 'principle of comparative advantage' does not determine the flows of trade. Indeed, as Yukizawa and Ruffin adequately demonstrated, Ricardo analysed the actual trade carried out, where trade flows, terms of trade and gains from trade (saving of labour) are all given as an aggregate consequence of individual exchanges. On the contrary, J. S. Mill, in his theory of international trade, fictitiously reversed the cause and effect, as if the countries would open trade because they can 'gain from trade.'

In Ricardo's argument, merchants act in self-interest and cease to export commodities if prices fall below their cost of production, that is, the wage costs plus the general profits.¹⁴ If prices exceed their cost of production, they make more than the general profits, but when other merchants enter the market, prices will fall back down to the natural price and profits to the general rate.

According to Ricardo, the natural price is the cost of production in monetary terms and it changes in proportion to the value of money: 'Its natural price, its money cost of production, would be really altered by the altered value of money' (*Works* I, 383).

The difference in the value of money, presented in Chapter 7 of the *Principles*¹⁵ and discussed in the third conclusion above, applies to this aspect. Due to changes in the distribution of precious metals caused by destabilising shocks, the value of money differs among countries. Although Ricardo saw little difference between domestic and international prices, the characteristic of international exchange exists in this aspect. Ricardo observes in the *Notes on Malthus*:

I cannot agree with Adam Smith, or with Mr. Malthus, that it is the nominal value of goods, or their prices only, which enter into the consideration of the merchant. He has clearly nothing to do with the value of the necessaries and conveniences of life in Bengal, when he purchases Muslin there,

14 Ricardo's concept of general profits is different from that of Marx's average profits. See Takenaga (2000, 23, 28).

15 In Chapters 1–6 of the *Principles*, Ricardo considers money invariable in value but in Chapter 7, he introduces the changes of the value of money. As for the role of monetary flow and price level changes, we will illustrate in III–3.

with a view to sell them in England; but as he must pay for his goods, either in money, or in goods, and expects to sell them with a profit in money, or in goods, he cannot be indifferent to the real value of the medium in which his profits, as well as the value of the goods, are to be realised.

(*Works* II, 26–27)

Ricardo explained not only domestic, but also international, exchange based on the natural price, taking into consideration changes in the value of money. Thus, Ricardo consistently adopted the cost-of-production theory of value, with natural price as the key concept.

III What Value Theory Did Ricardo Aim to Construct?

1. Ricardo's Cost-of-production Theory of Value

It is widely accepted among economists and historians of economic thought, such as Viner, Haberler, and Ruffin,¹⁶ as well as Marxian theorists, that Ricardo's value theory was the labour theory of value. On the other hand, J. S. Mill regarded Ricardo's value theory as the 'principle of cost of production,' which is applicable to domestic exchange but not to international exchange. One of Ricardo's contemporaries, Whewell, also regarded it as the cost-of-production theory of value (Faccarello [2015] 2017, 115; Whewell 1831, 31).

There are many who agree that Ricardo's value theory characterised the cost-of-production theory, but most insist that the two value theories coexisted in Ricardo. Peach says, 'Ricardo had two primary concepts of "value," one which was related to "quantity of labour," the other of more conventional, (relative) "cost of production" nature' (Peach 1993, 207).

Against the academic background, it is notable that Takenaga tried to 'understand Ricardo's value theory exclusively as the cost-of-production theory, not the labour theory' (Takenaga 2000, 116).¹⁷

16 Ruffin (2002), based on an analysis of Ricardo's letters, insisted that Ricardo established the labour theory of value around February 1816, but recognised that his value theory was inapplicable to international trade; thus, he discovered the principle of comparative advantage in mid-October 1816. However, Ruffin's argument about when Ricardo discovered the principle of comparative advantage was disproved by Gehrke (2015). It cannot be proved that the value theory Ricardo tackled was the labour theory of value, nor that Ricardo established it in this period, according to the quote. Rather, as stated in Sraffa's introduction (*Works* I, xv–xvi), it was the so-called 'curious effect' that Ricardo pondered when he had 'been beyond measure puzzled to find out the law of price' from the summer of 1816 to mid-October that year. It would follow that Ricardo established his value theory (whichever kind of theory it may be) around mid-October 1816, when he sent the manuscript of Chapters 1 to 7 to J. Mill.

For Ricardo, values are, in short, costs of production—that is, wage costs plus general profits. As demonstrated below, there are many instances in which Ricardo definitely identified value with cost of production, whereas Ricardo never formulated the labour theory of value.¹⁸

Ricardo seems to consistently support the cost-of-production theory of value through his works from the *Essay on Profits* (1815) to the posthumous paper 'Absolute Value and Exchangeable Value' (1823).

In the *Essay on Profits*, Ricardo adopted the cost-of-production theory of value, although he did not yet refer to the rule that the relative value (or cost of production) of commodities should be in proportion to the quantity of labour bestowed on them.

Though the price of all commodities is ultimately regulated by, and is always tending to, the cost of their production, including the general profits of stock, they are all subject, and perhaps corn more than most others, to an accidental price, proceeding from temporary causes. (*Works IV*, 20)

In a footnote added to the third edition of the *Principles*, Ricardo countered Malthus's argument and insisted:

Mr. Malthus appears to think that it is a part of my doctrine, that the cost and value of a thing should be the same;—it is, if he means by cost, 'cost of production' including profits. (*Works I*, 47)

17 Takenaga's observations are exquisite: 'When Ricardo talks about labour time, the unit is 'day's labour' (*Works I*, 26). . . . That is why, if the amount of wage per man per day is given, the quantity of capital expended for the employment of labour is understood directly as the index of quantity of labour bestowed. . . . It follows that the 'labour required for production,' which Ricardo thought regulates values, has two meanings: the 'living labour required for production' and the 'amount of money required for the employment of that living labour' (Takenaga 2000, 26–27); 'Ricardo implicitly ignores fixed capital and concentrates on circulating capital when he discusses the distribution of product' (Takenaga 2000, 24); and 'Ricardo understood surplus as naturally generated residual, subtracting real wages from the product of the day's labour, both of which are also naturally determined, not as the result of the class struggles between capitalists and labourers. Therefore, Ricardo's trade-off relation between wage and profit cannot directly be connected to Marx's surplus value theory . . . it explains the class confrontation between capital and land-ownership through the increase of value of wages fixed in real terms and the natural deterioration of terms of cultivation of lands' (Takenaga 2000, 26).

18 S. Hollander, who seems to regard it as a given fact that Ricardo's theory was based on the labour theory of value, admitted 'that he had never formulated a strict labour theory' (Hollander 1979, 209).

In relation to this remark, Ricardo gave detailed accounts on the cost-of-production theory of value in the *Notes on Malthus*¹⁹:

A commodity is at its natural value, when it repays by its price, all the expences that have been bestowed, from first to last to produce it and bring it to market. If then my expression conveys the same meaning as cost of production, it is nearly what I wish it to do.

The real value of a commodity I think means the same thing as its cost of production, and the relative cost of production of two commodities is nearly in proportion to the quantity of labour from first to last respectively bestowed upon them. (Works II, 35)

I say [a commodity's] whole value will be *in proportion to* a portion of its cost. . . . (Works II, 101–02)

Natural price is only another name for cost of production. When any commodity sells for that price which will repay the wages for labour expended on it, will also afford rent, and profit at their then current rate, Adam Smith would say that commodity was at its natural price.

(Works II, 46, emphasis added)

But what is meant by a quantity of labour, being the cost of a commodity?—by cost, is always meant the expence of production estimated in some commodity, which has value, and it always includes profits of stock. *The cost of production of two commodities, as I before observed, may be in proportion to the quantity of labour employed on them, but it is essentially different from the labour itself.* (Works II, 79, emphasis added)

These quotations indicate that Ricardo's cost-of-production theory of value consists of two subsets:

1. Value is the cost of production including general profits. By the cost of production, Ricardo means wage costs plus general profits.
2. The cost of production of two commodities may be in proportion to the

¹⁹ Ricardo wrote the *Notes on Malthus* from July to November 1820, but it was only in 1919 that it came to light (Works II, xv). According to Sraffa, number of changes in the third edition of the *Principles* embody material from the *Notes on Malthus* (Works II, xi).

quantity of labour employed on them.

It must be noted again here that natural price is another name for the cost of production in monetary terms and that Ricardo often described wage costs included in costs of production as the 'quantity of labour,' as Takenaga (2000) pointed out.

2. What Is the 'Rule Which Regulates the Relative Value of Commodities in One Country' in Chapter 7 of the *Principles*?

If Ricardo's *Principles* is logically consistent, he must have discussed the cost-of-production theory of value, not the labour theory of value, in Chapter 7 of the *Principles*.²⁰

For Ricardo, when discussing foreign trade in the section regarding the so-called 'theory of comparative costs'²¹ in the *Principles*, Chapter 7, the most important point is that the rule that regulates the relative value of commodities in domestic exchange is invalid in international exchange.²² To stress its importance, he repeated this point three times in the chapter (*Works* I, 133, 134–35, 135).

The 'rule which regulates the relative value of commodities in one country' is quite often referred to as the 'labour theory of value,' and this issue is almost always defined as the 'invalidity of the labour theory of value' in international exchange. Nevertheless, now that Ricardo's value theory is recognised as the cost-of-production theory, it is impossible that the 'rule' should refer to the 'labour theory of value.' Instead, it must be understood that the 'rule' refers to subset 2 of the cost-of-production theory of value discussed previously: the cost of

20 As explained in Sraffa's introduction, Chapter 1, 'On Value,' of the *Principles* was divided into sections in the second edition (1819) and extensively altered in the third edition (1821), whereas Chapter 7, 'On Foreign Trade,' remains unchanged since the first edition (1817). Sraffa noted that 'the theory of edition 3 appears to be the same, in essence and in emphasis, as that of edition 1' (*Works* I, xxxviii). Sraffa also noted, 'The changes in this [third] edition were considerably more extensive than those made in edition 2. Yet Ricardo seems to have regarded them, for the most part, as unimportant' (*Works* I, liv).

21 See Sraffa's introduction (*Works* I, xvii). Sraffa divided Chapter 7 into three parts according to J. Mill's letter to Ricardo on November 18, 1816, and defined the 'theory of comparative costs' from the third paragraph of page 133 to the first paragraph of page 137. Incidentally, the phrase 'theory of comparative costs' was used by Sraffa, not by Ricardo.

22 It seems more important for Ricardo than the so-called 'theory of comparative costs' itself. According to Ruffin, 'Indeed, of the 973 words Ricardo devoted to explaining the law of comparative advantage, 485 emphasised the importance of factor immobility!' (Ruffin 2002, 734).

production of two commodities may be in proportion to the quantity of labour employed on them.

To summarise, for Ricardo, value is always the cost of production (subset 1). In domestic exchange, where capital and labour are mobile, the cost of production of two commodities may be in proportion to the quantity of labour (subset 2). On the other hand, in international exchange, the cost of production (natural price) still regulates prices of commodities (subset 1), but the 'rule' that the cost of production of two commodities may be in proportion to the quantity of labour (subset 2) is invalid.

Ricardo attributed the invalidity of the 'rule' to the relative immobility of capital and labour, which prevents an equal rate of profits and wages among countries.²³

The difference in this respect, between a single country and many, is easily accounted for, by considering the difficulty with which capital moves from one country to another, to seek a more profitable employment, and the activity with which it invariably passes from one province to another in the same country. (Works I, 135–36)

Ricardo suggests that if capital and labour were perfectly mobile among countries, the relative price of the commodities traded between two countries (except transportation costs) might be in proportion to the quantity of labour required for them as though they were traded in the same country and the rate of profits and wages in the countries would tend to be equal. In the case of Ricardo's example, capitalists in England would then move their capital and labour in making cloth to Portugal and, consequently, cloth would not be produced in England. Thus, the exchange between the product of different amounts

23 The relative immobility of capital and labour, which Ricardo supposes here, is generally abstractly interpreted as the 'immobility of production factors.' However, Ricardo believed capitalists move both capital and labour (See the quotation below). Otherwise, there is no reason why not only capital, but labour as well, would move to the country where the rate of profits is higher, that is, wages are possibly lower. If capitalists move capital and labour from lower to higher-profit countries, the rate of profits in both countries tend to be equal because labour immigration also means the immigration of the population; thus, 'from the diminished rate of production in lands, wages should rise, and profits fall' in the host country (Works I, 134). Ricardo's reasoning is entirely different from the so-called 'Ricardian Model' in textbooks, in which a 'one factor economy' is assumed (thus, profits do not exist) and thus the flexible relative rate of wages between countries should adjust for the labour productivity differentials between countries: 'I have to persuade students that low-wage (low-productivity!) nations cannot undersell us in everything' (Samuelson [1969] 1972, 679). See also Gehrke (2015, 800).

of labour (such as the product of the labour of 100 Englishmen and of 80 Portuguese) would no longer occur among countries.

3. Ricardo's Cost-of-production Theory of Value and the Analysis of Monetary Adjustment in International Exchange

According to Ricardo's cost-of-production theory of value, the domestic relative value of commodities produced at the same ratio of capital/labour in the same period should be in proportion to the quantities of labour employed in producing them.

If men employed no machinery in production but labour only, and were all the same length of time before they brought their commodities to market, the exchangeable value of their goods would be precisely in proportion to the quantity of labour employed.²⁴ (*Works I*, 31)

This rule of determining value should be satisfied in the same country where capital and labour can move freely, without taking gold as 'the general medium of circulation' (*Works I*, 137) into consideration.

For simplification, let us consider that two kinds of commodities (goods 1 and 2) are produced in one year only by labour; capital thus is composed of a wage fund for the maintenance of labour. Following the supposition of the mobility of capital and labour in the domestic market, the general rate of profits (denoted as r) and the general rate of wages (denoted as w) should be established among the industries. If the quantity of labour employed per one unit of good i is a_i ($i=1, 2$), the natural prices of goods 1 and 2 can be given as the following equations, respectively.

$$p_1 = wa_1(1+r), \quad (1)$$

$$p_2 = wa_2(1+r). \quad (2)$$

From (1) and (2), we obtain

24 In the third edition of the *Principles*, relating to the problem of the so-called modifications of values, the point of view of distinguishing the difference between fixed and circulating capital disappeared and in the posthumous paper "Absolute Value and Exchangeable Value" (1823), Ricardo increasingly recognized the differences of the period of production as those of terms of production: 'It appears then that we should have no difficulty in fixing on a good measure of value, if all commodities were produced exactly under the same circumstances—that is to say if all required labour only without advances, to produce them, or all requiring labour and advances could be produced and brought to market in precisely the same time' (*Works IV*, 368). Here, for simplification, we abstract fixed capital and suppose that capital only consists of circulating capital to pay wages, with a one-year production period as in the numerical example of Chapter 7.

$$\frac{p_1}{p_2} = \frac{wa_1(1+r)}{wa_2(1+r)} = \frac{a_1}{a_2}. \quad (3)$$

Equation (3) shows the rule that the relative price of the two commodities is in proportion to the quantity of labour employed in the production of them.²⁵

Now, let us turn to the discussion of Ricardo's 'four numbers' in the England-Portugal example. According to the new interpretation of Yukizawa and Ruffin, the quantities of cloth and wine traded between these countries must be given as \bar{X} and \bar{Y} , respectively.²⁶ Since \bar{X} units of English cloth and \bar{Y} units of Portuguese wine are thus equivalent ($p_x\bar{X}=p_y\bar{Y}$), we obtain

$$\frac{p_x}{p_y} = \frac{\bar{Y}}{\bar{X}}. \quad (4)$$

Equation (4) shows the *ex ante* determination of the terms of trade (p_x/p_y) in Ricardo's England-Portugal example. The equation can be rewritten as

$$\frac{p_x\bar{Y}}{p_y\bar{X}} = 1. \quad (5)$$

In Ricardo's example, \bar{X} units of cloth and \bar{Y} units of wine are produced by the labour of 100 men a year in England and 80 men the same year in Portugal, respectively. The relative cost of production can be written as

$$\frac{p_x\bar{X}}{p_y\bar{Y}} = \frac{100w(1+r)}{80w^*(1+r^*)}, \quad (6)$$

where w and w^* are the general rates of nominal wages in England and Portugal, respectively, and r and r^* are the general rates of profits in each country. If $w \neq w^*$ and/or $r \neq r^*$,

$$\frac{p_x\bar{X}}{p_y\bar{Y}} = \frac{100w(1+r)}{80w^*(1+r^*)} \neq \frac{100}{80}. \quad (7)$$

As (7) shows, the international immobility of capital and labour makes it impossible for the cost of production of the two commodities to be proportionate to the quantities of labour employed on them. Equation (5) cannot hold unless the wage rates and profit rates in each country are adjusted to satisfy $w(1+r)/w^*(1+r^*)=0.8$. This implies that Ricardo's discussion on the 'four numbers' should postulate such a monetary adjustment if the cost-of-production theory of value can be applied to the case of international exchange, as well as the domes-

25 What is called the Ricardian 'labour theory of value' is thus considered a subset rule of the cost-of-production theory of value. It only explains that the relative value of commodities is in proportion to 'a portion of its cost' (*Works* II, 101), that is, the quantity of labour bestowed on them and, therefore, differs from the Marxian labour theory of value, according to which the absolute value of any commodity is determined by labour. For Ricardo, it was a makeshift solution for simplification, ignoring the existence of fixed capital and the differences of the period of production. See also note 17 and 24.

26 See Table 1.

tic exchange of commodities.

Let us now take gold as 'the general medium of circulation' into consideration, rewriting equation (7) in terms of gold as follows:

$$\frac{p_x \bar{X}}{g p_y \bar{Y}} = \frac{100}{80} \left[\frac{w(1+r)}{g w^*(1+r^*)} \right], \quad (8)$$

where g is the monetary adjustment factor between in England and Portugal, respectively. We can then understand the following relationship:

$$\frac{p_x \bar{X}}{g p_y \bar{Y}} \bigg|_{\frac{w(1+r)}{g w^*(1+r^*)} = 0.8} = 1. \quad (9)$$

Equation (9) implies that, as the result of the adjustment of gold values among countries, even when $w(1+r)/w^*(1+r^*) \neq 0.8$, the cost-of-production theory of value can still be applied to international exchange as well as the domestic exchange of commodities.²⁷

Ricardo explained this in the *Notes on Malthus*:

If labour were much higher in Yorkshire, than in Gloucestershire, profits would be lower, and capital would by degrees be removed from the former to the latter place; so that each district would have that portion of the general capital which it could most beneficially employ;—not so between independent countries. Capital does not move from England to Poland, merely because labour is cheaper there; *and for this reason*, gold will be low in value compared with labour in one place, high in another.²⁸

(*Works* II, 86–87, emphasis added)

Thus, for Ricardo, the value of commodities is determined by their cost of production both, in domestic and international exchange. In domestic exchange, it is not necessary to consider precious metals as 'the general medium of circulation' in determining the relative values of commodities, and here, the rule is

27 A detailed explanation is given in Tabuchi and Hisamatsu (2018).

28 Faccarello ([2015] 2017, 92) offers a different viewpoint: he questions whether the relative immobility of capital and population should 'imply that the theory of value is no longer valid in international exchanges.' He seems to answer this question as follows: 'foreign trade . . . can only be regulated by altering the natural price . . . and that is effected by altering the distribution of the precious metals' and it 'also explains why, even if the theory of labour value determines relative domestic prices, international exchanges are in general made at different rates' (Faccarello [2015] 2017, 108). However, it should be noted that, for Ricardo, the value of gold may differ among countries because of the relative immobility of capital and labour before or unless the destabilizing shocks occur, such as the improvement of making wine in England analysed in the latter half (below the second paragraph of page 137) of the *Principles*, Chapter 7.

valid that the relative value of commodities may be in proportion to the quantity of labour required for them. However, in international exchange, the rule is invalid because of the international immobility of capital and labour and, *for the same reason*, the value of gold differs among countries. Hence, it is necessary to take into consideration precious metals as 'the general medium of circulation' in the determination of relative values. Thus, Ricardo's value theory, when it is applied to the analysis of international exchange, inevitably involves the consideration of monetary adjustment.

IV Concluding Remarks

Ricardo explains his value theory in Chapter 1 of the *Principles*:

[I]n estimating the exchangeable value of stockings, for example, we shall find that their value, comparatively with other things, depends on the total quantity of labour necessary to manufacture them, and bring them to market. First, there is the labour necessary to cultivate the land on which the raw cotton is grown; secondly, the labour of conveying the cotton to the country where the stockings are to be manufactured, which includes a portion of the labour bestowed in building the ship in which it is conveyed, and which is charged in the freight of the goods; thirdly, the labour of the spinner and weaver; fourthly, a portion of the labour of the engineer, smith, and carpenter, who erected the buildings and machinery, by the help of which they are made; fifthly, the labour of retail dealer, and of many others, whom it is unnecessary further to particularize. The aggregate sum of these various kinds of labour, determines the quantity of other things for which these stockings will exchange, while the same consideration of the various quantities of labour which have been bestowed on those other things, will equally govern the portion of them which will be given for the stockings. (Works I, 24–25)

It is important to note that, in the passage 'First, there is the labour necessary to cultivate the land on which the raw cotton is grown,' unless the raw cotton is cultivated in England, 'labour' here refers to the labour employed in a foreign country, such as India.

If so, it is impossible to fix 'the aggregate sum of these various kinds of labour' in the last sentence of the quote, not only by the labour theory of value, but also using decomposition in dated quantities of labour. The only possible solution comes from understanding 'the aggregate sum' as the sum of the cost of production in monetary terms (or natural price) including profits, based on the

comprehension that Ricardo's concept of labour is double-barrelled, meaning the 'living labour required for production of a commodity' and the 'wage costs required for employment of labour.'

McKenzie, a pioneer who developed the theory of international trade including intermediate goods, pointed out the importance of intermediate goods trade, stating, 'A moment's consideration will convince one that Lancashire would be unlikely to produce cotton cloth if the cotton had to be grown in England' (McKenzie 1953–54, 179). Ricardo's previous quote, resonating with McKenzie's remark, is amazing in that it is reminiscent of the present-day 'global value chain.'

Ricardo's value theory, presented in his *Principles*, integrates the domestic value theory and international value theory, including the intermediate goods trade, requisitely taking into consideration changes in the value of money. Although Ricardo could not resolve some important aspects required for the construction of such a theory, it is noteworthy that Ricardo was heading in the right direction. Ricardo's original theory developed in the opposite direction of the so-called 'Ricardian Model' in textbooks today, which derived from the process of reconstruction since J. S. Mill's arguments.

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