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# Was Adam Smith a Proponent of Absolute Advantage Theory? A formative history of an urban legend and lessons learned

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# Was Adam Smith a Proponent of Absolute Advantage Theory? A formative history of an urban legend and lessons learned

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**Abstract**

This article argues that the widely accepted belief that Adam Smith was proponent of absolute advantage theory of international trade, which says industries with internationally higher physical productivities always export, is a fallacy that was created later than his time, and that he had recognized the concept of comparative advantage in the form of comparing unit production costs by taking into account international differences of both physical productivities (inverse of labor input coefficient) and wage rates. Smith was indeed discussing the possibility of international trade in the Ricardian situation in which one country is more productive than the other in all industries. We then explore the origin of the myth of Smith-as-absolute-advantage-theorist by investigating who and when it was created. We examined certain statements by James Mill, McCulloch, J.S. Mill, Bastable, Ingram, Viner, Schumpeter, etc., and found that the explicit claim of this myth was widely spread after the World War II.

Keywords: absolute advantage, Adam Smith, eighteenth-century rule, the wage differential

JEL: B10, B20, F10

## 1. Introduction

This article, from the viewpoints of the history of economic doctrines and that of the sociology of science, examines an urban legend in economics, or the fallacious belief that, prior to David Ricardo, Adam Smith formulated the absolute advantage theory in international trade (Morin 1971, Brunvand 1981, Brodie 1995). This belief is widespread in today's academic communities and educational systems in economics. For example, about a half (47.5%), or 19 out of 40 English-

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written textbooks of international economics that we investigated, as well as 40%, or 10 out of 25 Japanese-written ones, explicitly mentioned that Adam Smith was a proponent of absolute advantage theory. On the Internet, Smith is even more frequently referred to as an absolute advantage theorist.

As argued by many researchers, Adam Smith discussed "vent for surplus," "productivity improvement by the effect of the new market discovery (export)," and "absolute advantage theory" as an international trading issue. However, because the separation of those three topics has been pointed out often (see Blecker 1996), researchers have attempted to integrate them and/or offer new interpretations of Smithian trade theory (see Myint 1958, 1977; West 1990; Elmslie and James 1993; Elmslie 1994). Except for Ruffin (2005, 2011), however, it is difficult to find one person who doubts the abovementioned urban legend, or the belief that Smith was a founder or proponent of absolute advantage theory. Whereas the origin of comparative advantage theory is argued extensively (Leser 1881; Seligman 1903, 1911; Hollander 1911; Viner 1937; Robbins 1958; Chipman 1965; Thweatt 1976, 1987; Gomes 1987; Irwin 1996; Maneschi 1998, 2004; Ruffin 2002, 2005; Aldrich 2004), there has been only insufficient consideration given to the origin and concept of absolute advantage theory.

Schumacher (2012) investigates the historical background that various aspects of Smith's trade theory have been excluded from economics and that only absolute advantage theory has survived in neoclassical economics. As we will see later, however, Smith is not a proponent of absolute advantage theory. Therefore, there is an issue of the investigation for the historical background of this certification. Who identified Smith as a proponent of absolute advantage theory? How was the certification carried out? The main purpose of this paper is to clarify this point.

Against this background, in Section 2 of this article, we first argue that Smith was not the proponent of absolute advantage theory by showing his own statements as pieces of evidence. Besides, we show that Smith, in fact, had recognized the possibility of international trade in a "Ricardian" situation in which one country is more productive than the other in all industries.

We then investigate some questions regarding this fallacy of Smith-as-absolute-advantage-theorist – when, by whom, and why it came to existence? What are the lessons for us? We attempt to answer these questions by revealing a long-inherited misconception in the field of international trade theory.

In Section 3, we show that the origin of the fallacy that Smith was the

absolute-advantage theorist dates back to the first half of the 20th century, but that it became popular only after the second half of the 20th century. We also argue, however, that more remote causes of this fallacy go further back to the second quarter of the 19th century when John Stuart Mill began to investigate Ricardo's theory of international trade. J. S. Mill is arguably responsible for what may be called a "deformed interpretation" (after Yukizawa 1974) of Ricardo's text that opened the way to the misunderstanding of Ricardo's original text, as well as other texts prior to Ricardo (see also Maneschi 2004), which is also referred to as "the 18th-century rule," an expression coined by J. Viner (1937) based on Mill's misinterpretation of Ricardo.

In Section 4, we show that the 18th-century rule is, in fact, correct, or that classical writers from Henry Martin to Adam Smith had correctly understood the principle of comparative advantage in foreign trade in that they took into account not only international differences of physical productivities but also those of wage rates, even though they could not explain it as clearly as Ricardo. Here we assert that one of the major cause of this fallacy is the neglect of an important concept in international trade, international wage differences, in the analyses after J. S. Mill. Section 5 concludes our arguments.

**2. Adam Smith was not a proponent of absolute advantage theory.**

There are few explicit remarks that state Smith did not proclaim the so-called absolute advantage theory[4]. We could find only one such remark (Ruffin 2005, 2011).

> "It is interesting that Adam Smith himself did not fall into the fallacy of absolute advantage, though many textbooks allege that he is responsible for the theory of absolute advantage. When, on superficial reading, Smith appeared to discuss absolute advantage, he did not lapse into Torrens's error, and coolly made a correct argument that the gains from trade result form devoting fewer home resources exporting other goods to pay for imports" (Ruffin, 2011, p.17).

According to Ruffin (2011), it was Robert Torrens who proclaimed that gains from trade would occur only when one country exports goods that require

[4] In fact, the expression "absolute advantage theory" is ambiguous. We return to this question in Section 4.

less labor and capital at home to countries that produce the same goods with more labor and capital. Absolute advantage doctrine may be older than Torrens, but this study is not concerned with who originated absolute advantage doctrine. We are concerned only with the myth that Smith explained a commerce by the absolute advantage theory.

The following is a common definition of the theory understood as absolute advantage theory in the present day. For international trade to start, it is necessary only that some countries possess advantages over other countries in the physical productivity of some goods. In other words, within an identical industry between countries, when comparing physical labor productivity (the inverse number of the labor input coefficient that produces a unit of goods, and not production cost), physical productivity is more predominant than in another country and, under this situation only is international trade established.

Ruffin (2005, 2011) is a pioneer of the issue that Smith was not an absolute advantage theorist. His assertion is based on the fact that Smith does not compare physical productivities.

“By means of glasses, hotbeds, and hot walls, very good grapes can be raised in Scotland, and very good wine too can be made of them at about thirty times the expence for which at least equally good can be brought from foreign countries. Would it be a reasonable law to prohibit the importation of all foreign wines merely to encourage the making of claret and burgundy in Scotland? But if there would be a manifest absurdity in turning towards any employment thirty times more of the capital and industry of the country than would be necessary to purchase from foreign countries an equal quantity of the commodities wanted, there must be an absurdity, though not altogether so glaring, yet exactly of the same kind, in turning towards any such employment a thirtieth, or even a three-hundredth part more of either. Whether the advantages which one country has over another be natural or acquired is in this respect of no consequence. As long as the one country has those advantages, and the other wants them, it will always be more advantageous for the latter rather to buy of the former than to make.

” (Smith 1776, vol. 1, p.423).

According to Ruffin, Smith does not state that it requires 30 times the quantity of labor in production more than another country. He states only that it requires 30 times the “expence.” The term "expence" is not used for physical productivity, and

is a monetary term.

In our investigation, the following quotation also shows that Smith considers monetary terms.

> “What is prudence in the conduct of every private family can scarce be folly in that of a great kingdom. 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. The value of its annual produce is certainly more or less diminished when it is thus turned away from producing commodities evidently of more value than the commodity which it is directed to produce. According to the supposition, that commodity could be purchased from foreign countries cheaper than it can be made at home” (Smith 1776, vol. 1, p.422).

As Smith states “cheaper,” so he compares "expence," not productivities, between two countries. When capital and labor are used for a certain purpose, it is important whether the total cost is superior to other countries. In other words, cost per unit, interest, wage, and transportation cost are all taken into account in trade. That is, "price" represents all of them. Therefore, Smith considers the gain from trade based on natural price. In this case, there is the problem that the natural price differs when the wage rate differs between countries.

It is important that Smith recognizes the wage differential among countries. Smith (1776, vol. 2, p. 100) states that the products made in other countries are sold cheaper than the products made in Great Britain at a foreign market because the wage rate in GB is higher than other countries. Moreover, in the correspondences of Smith to Lord Carlisle and between Smith and Henry Dandas (see Rae 1895, in Section XXIII), they argue about a threat on the trade for England because of low wage in Ireland. Although wages in Ireland are lower than in GB, GB is superior to Ireland in physical productivity. Therefore, Smith concludes that Ireland is not a threat in terms of price.

Thus, Smith puts a domestic price system (value system) at the center of

his consideration and adopts a way of thinking that compares a given import price with the domestic price. In other words, the price does not obey the law of one price. In other words, Smith has never discussed international trade in terms of absolute advantage theory.

Besides, we find a paragraph that shows that Smith did know that trade is possible even in situations in which one country has superior productivity to another country in all industries. This paragraph appears in Chapter 1 in Book I, that is, just after the famous pin factory story. We cite the last half of this lengthy paragraph:

> "This impossibility of making so complete and entire a separation of all the different branches of labour employed in agriculture, is perhaps the reason why the improvement of the productive powers of labour in this art, does not always keep pace with their improvement in manufactures. The most opulent nations, indeed, generally excel all their neighbours in agriculture as well as in manufactures; but they are commonly more distinguished by their superiority in the latter than in the former. Their lands are in general better cultivated, and having more labour and expence bestowed upon them, produce more in proportion to the extent and natural fertility of the ground. But this superiority of produce is seldom much more than in proportion to the superiority of labour and expence. In agriculture, the labour of the rich country is not always much more productive than that of the poor; or, at least, it is never so much more productive, as it commonly is in manufactures. The corn of the rich country, therefore, will not always, in the same degree of goodness, come cheaper to market than that of the poor. The corn of Poland, in the same degree of goodness, is as cheap as that of France, notwithstanding the superior opulence and improvement of the latter country. The corn of France is, in the corn provinces, fully as good, and in most years nearly about the same price with the corn of England, though, in opulence and improvement, France is perhaps inferior to England. The corn-lands of England, however, are better cultivated than those of France, and the corn-lands of France are said to be much better cultivated than those of Poland. But though the poor country, notwithstanding the inferiority of its cultivation, can, in some measure, rival the rich in the cheapness and goodness of its corn, it can pretend to no such competition in its manufactures; at least if those manufactures suit

> the soil, climate, and situation of the rich country. The silks of France are better and cheaper than those of England, because the silk manufacture, at least under the present high duties upon the importation of raw silk, does not so well suit the climate of England as that of France. But the hard-ware and the coarse woollens of England are beyond all comparison superior to those of France, and much cheaper too in the same degree of goodness. In Poland there are said to be scarce any manufactures of any kind, a few of those coarser household manufactures excepted, without which no country can well subsist" (Smith 1776, vol. 1, pp. 8-9).

As is always the case, historical texts are in many aspects ambiguous. The case of Adam Smith is no exception. In this paragraph, Smith talks about opulence and improvement of a country in comparison to others. Various interpretations are possible but from the first part of the paragraph (not cited here), it is clear that Smith is talking about superiority in the method of production. Smith explains that France is superior to Poland in both agriculture and manufacturing and that England is superior to France in both agriculture and manufacturing. However, Smith mentions that trade is possible in this situation. Poland, in spite of the inferiority of its cultivation, could rival France and England in the cheapness and goodness of its corn, Smith argues.

If the superiority of an industry can be interpreted as higher productivity, for example, labor productivity, for the sake of simplicity, then the situation that Smith considers may be formulated as the following numerical table:

| **Necessary Labor** | **Corn** (Agriculture) | **Hardware** (Manufacturing) |
|---|---|---|
| Poland | 100 | 100 |
| France | 50 | 25 |
| England | 25 | 5 |

England has higher productivity than France for both corn and hardware, but its superiority is greater in manufacturing than in agriculture. France has higher productivity than Poland for both corn and hardware, but its superiority is greater in manufacturing than in agriculture. This is precisely the case that Ricardo (1817) examines when he explains the gains from trade. Smith and Ricardo observe that trade occurs even in this situation. The only difference between Smith and Ricardo

is that Ricardo explains the gains from trade explicitly whereas Smith does not.

We consider this to be sufficient to prove that Smith was not a proponent of absolute advantage doctrine. Not only did he not succumb to the fallacy of absolute advantage doctrine (as mentioned by Ruffin 2011), Smith was aware that trade would take place in a Ricardian situation, that is, when one country is superior to another in all industries. It is a gross misinterpretation to consider Smith an absolute advantage theorist. In view of this fact, the birth of the legend would be an interesting topic in the history of economic theories. In Section 3, we report on the results of our investigation into the origin of the legend and the manner in which it spread.

**3. Who advocated and dispersed the legend?**

Concerning the origin of comparative advantage theory, Martyn (1701) and Gervaise (1720) are often mentioned as antecessors (see Viner 1937; Schumpeter 1954; Samuelson 1962). These days, it is usually said that the person who formalized the theory clearly for the first time was Ricardo or Torrens or both, namely, "a case of multiple discoveries," and in addition, that James Mill played an important role in that conception (see Seligman 1903, 1911; Hollander 1911; Viner 1937; Robbins 1958; Chipman 1965; Thweatt 1976, 1987; Gomes 1987; Irwin 1996; Maneschi 1998, 2004; Ruffin 2002, 2005; Aldrich 2004).

However, the focus of our interest is not on the origin of comparative advantage theory and is rather on Smith because only Smith, who is often called "the father of economics," has been branded as a proponent of absolute advantage theory, in spite of his consideration about the Ricardian situation. Thus, in this section, only the formative history of the urban legend is described in full detail and we consider the theoretical background in Section 4.

Although the history of economic thought is rich in arguments about the first appearance of the term "comparative" (see Hollander 1911; Seligman 1911; Viner 1937)[5], the first appearance of the term "absolute" is really unknown. The

[5] Seligman stated as follows: "Neither Torrens nor Ricardo uses the term 'comparative cost.' This term was introduced by Mill in his *Unsettled Questions* in 1844" (Seligman 1911, p. 448). Hollander points out that Torrens did use the term "comparative cost," but in a different connection, in his *Essay on the External Corn Trade,* 3d ed. 1826, p. 41, and claims that Mill first used the word "comparative" in connection with the theory of international trade (Hollander 1911, p. 461). However, Torrens did use the term "comparative cost" correctly in the 4th edition of his *Essay on the*

latter is more important for considering the urban legend about Smith. According to Ruffin (2005), Torrens (1815) introduced "productivity differentials" into trade theory for the first time[6], and clarified the logic that is now called absolute advantage theory, but, naturally, Torrens (1815) did not use the term of "absolute" because the term "comparative" or "relative" combined with "absolute" is a paired concept, and the former was not found in trade theory at that time. In economics, the term "absolute" has traditionally been used to express one of the two in cases of dichotomy[7].

First, it is important who compares productivity, not monetary terms. Martyn and Gervaise compare an expense in the same way as Smith. In addition, no person clearly stated absolute advantage theory before Smith. Ricardo (1817) in Chapter 7 explains comparative advantage theory, and that the gain from trade belongs to imports. The first half of Chapter 7 is described in terms of value and the explanation of comparative advantage is in terms of comparing productivity; the latter half is described in terms of precious metals (price). Therefore, the explanation method is changing. Ricardo converts the example of "a taylor and a shoemaker," which Smith also uses, into a productivity comparison, so that Ricardo might provide the illusion for a future generation *as if* Smith himself compares the

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*External Corn Trade* (1827, p. 401), and Ricardo, in all the editions of his *Principles,* used the phrases "comparative disadvantage as far as regarded competition in foreign markets" *(*Ricardo 1817 p.101) and "comparative facility of … production" *(Ibid.,* p. 226). Terminological usage by the classical economists must have been so influenced by their oral discussions as to make the record of priority in print have little bearing on the question of priority in use" (Viner 1937, p. 443, footnote 12).

[6] Also in Ricardo (1815), it seems that his explanations are in terms of absolute advantage theory. For example,
"If the legislature were at once to adopt a decisive policy with regard to the trade in corn – if it were to allow a permanently free trade, and did not with every variation of price, alternately restrict and encourage importation, we should undoubtedly be a regularly importing country. **We should be so in consequence of the superiority of our wealth and population, compared to the fertility of our soil over our neighbours.** It is only when a country is comparatively wealthy, when all its fertile land is in a state of high cultivation, and that it is obliged to have recourse to its inferior lands to obtain the food necessary for its population; or when it is originally without the advantages of a fertile soil, that it can become profitable to import corn" (Ricardo 1815, pp. 26–27).

[7] For example, "absolute fertility" and "relative fertility" are used in the case of the fertility of the land in Smith (1776). "Absolute value" and "relative value" are used in the case of value theory in Ricardo (1817).

productivity. However, Ricardo states in Chapter 9 that "the motive which determines us to import a commodity, is the discovery of its relative cheapness abroad: it is the comparison of its price abroad with its price at home" (*Ibid*., p.170). Therefore, he understands that trade begins with a comparison of prices (production cost).

Descriptions in James Mill (1818) are noteworthy for their conversion to a physical productivity comparison from a production cost comparison.

> "Not only does a variation in the state of wages and profits give no obstruction to foreign trade, a variation even in the cost of production gives no obstruction. A nation exports to another country, not because it can make cheaper than another country; for it may continue to export, though it can make nothing cheaper. It exports, because it can, by that means, get something cheaper from another country, than it can make it at home. But how can it, in that case, get it cheaper than it can make it at home? By exchanging for it something which costs it less labour than making it at home would cost it. No matter how much of that commodity it is necessary to give in exchange. So long as what it does give is produced by less labour, than the commodity which it gets for it could be produced by at home, it is the interest of the country to export" (J. Mill 1818, 269).

Thereafter, Mill explains comparative advantage with the numerical example of a laborer. Ricardo (1817) changes the explanation from a criterion by value to a criterion by productivity without the remarks, but Mill clearly refers to the conversion to a productivity comparison. Thereafter, Mill (1821) completely explains international trade only by productivity comparison. Mill states in a preface as follows:

> "My object has been to compose a school-book of Political Economy, to detach the essential principles of the science from all extraneous topics, to state the propositions clearly and in their logical order, and to subjoin its demonstration to each" (J. Mill 1821, p. iii)

Perhaps Mill recognizes that Ricardo's trade theory can be explained only by physical productivity, and has the intention to see through the nature of the theory. Alternatively, he might follow in the steps of the explanation in Chapter 7 of

Ricardo (1817), because unfortunately, Ricardo explains comparative advantage only by physical productivity, in spite of his correct understanding about the start of trade.

As for the distinction between the two concepts in trade theory, our investigation reveals that James Mill (1821) probably arranged the theoretical distinction for the first time[8]. After the descriptions, in which he explains absolute advantage theory and comparative advantage theory, and which profits are not issued in some country in terms of absolute advantage theory, Mill states as follows:

> "When both countries can produce both commodities, **it is not greater *absolute*, but greater *relative, facility***, that induces one of them to confine itself to the production of one of the commodities, and to import the other" (J. Mill 1821, p. 87).

This sentence is a contradistinction between "absolute facility" and "relative facility," but "facility" has the same meaning as "advantage" in the modern period. Similarly, in Ricardo (1810), Malthus (1814), and Torrens (1815), "facility" is used to describe the degree of productivity and it seems that "facility" is more common than "cost"[9] in those days. McCulloch (1824) admired such a conceptual arrangement by James Mill as follows:

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[8] McCulloch is estimated to have written the book review of *Principles of Political Economy and Taxation* by Ricardo in 1818. McCulloch undertakes a comparative review between Smith and Ricardo on many topics, and admires Ricardo from every angle. With regard to trade theory, however, McCulloch does not undertake a theoretical comparison, but only describes Ricardo's trade theory as follows: "This is one of the most valuable and original parts of the work before us" (McCulloch 1818, p. 83).

[9] Of course, Ricardo and Mill use the term "cost" too in other parts.
"Thus, 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" (Ricardo 1817, p. 137);
"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." (Mill 1821, p. 87).

> "Mr Mill's "*Elements of Political Economy*" is a work of a higher order; and is, perhaps, better calculated for the use of those who are considerably **advanced in the science than of beginners**. Mr Mill touches on almost every topic of discussion: ***He has disentangled and simplified the most complex and difficult questions***; has placed the various principles which compose the science in their natural order; and has shown their connection with and dependence on each other" (McCulloch 1824, p. 71).

However, James Mill arranges two concepts splendidly and distinguishes them in *Elements of Political Economy*, but he does not mention their proponents. Since Mill was a fervid follower of Ricardian economics, he probably set Smith and Ricardo in mind about the theoretical contrast; however, he does not specify their names[10] clearly such as the present textbook. The beginning of the 19th century was a time when the *Wealth of Nations* by Smith was *an authoritative work* among leading economists. In addition, with regard to trade theory, if the economic literature is considered around the decades of publication of a book, it can be understood clearly that Smith's free trade theory strongly influenced trade policy (see Irwin 1996). On the other hand, in theoretical situations like Mill's work, because a country exists that cannot participate in trade, namely, a country without profits, in terms of absolute advantage theory, "comparative advantage" was known among some economists. Moreover, among the Ricardians, there was "an alleged error in Ricardo" in which the division of the gain from trade was considered in terms of comparative advantage theory (see J. Mill 1821; Ellis 1825; McCulloch 1825; Viner 1926; Sraffa 1930).

In the early 19th century, however, because Smith's influence concerning the advocacy of free trade and criticism against mercantilism continued to remain strong, there are many works that quote Smith's authority yet, surprisingly, do not refer by name to Ricardo or comparative advantage theory in the academic circles, especially in countries other than England (see Carey 1819, 1822; Raymond 1820; Ravenstone 1821; Buckton 1825). Ricardian theory prevailed and came to the fore after the foundation of the "Political Economy Club" in London in 1821 that James Mill helped to establish. This club developed rapidly as the center of economic

[10] Even in *The Principles of Political Economy* by McCulloch (1825), who was another fervid follower of Ricardian economics, Ricardo's name is not mentioned. Rather, he enumerates Torrens as a nomenclator of the "territorial division of labour."

discussion and learning in Great Britain, and the heartland of economics moved from Scotland to England (see Robbins 1958; Rothbard 1995)[11]. In other words, since Ricardo's fame had not remained so high, the difference between Smith and Ricardo about a trade theory was so not as recognized in the early 19th century.

However, as soon as *Essays on Some Unsettled Questions of Political Economy* (1844), which was actually written in 1929 or 1930, and *Principles of Political Economy with some of their Applications to Social Philosophy* (1848) were published by John Stuart Mill, or by the time these books were published, this situation had changed completely by the persistent activities of such apostles as James Mill, J.S. Mill, and McCulloch.

> "**Of the truths with which political economy has been enriched by Mr. Ricardo**, none has contributed more to give to that branch of knowledge the comparatively precise and scientific character which it at present bears, than the more accurate analysis which he performed of the nature of the advantage which nations derive from a mutual interchange of their productions. Previously to his time, the benefits of foreign trade were deemed, even by the most philosophical enquirers, to consist in affording a vent for surplus produce, or in enabling a portion of the national capital to replace itself with a profit. The futility of the theory implied in these and similar phrases, was an obvious consequence from the speculations of writers even anterior to Mr. Ricardo. But it was he who **first**, in the chapter on Foreign Trade, of his immortal *Principles of Political Economy and Taxation*, substituted for **the former vague and unscientific**, if not positively false, conceptions with regard to the advantage of trade, a philosophical exposition which explains, with strict precision, the nature of that advantage, and affords an accurate measure of its amount" (J. S. Mill 1844, p. 1).

J. S. Mill clearly distinguishes Ricardo from other scholars before him, and probably has Smith in mind about the theoretical contrast because he describes "affording a vent for surplus produce" and "enabling a portion of the national capital to replace itself with a profit," which Smith refers to in *Wealth of Nations*. That is to say, J. S. Mill *implicitly* advocates that Ricardo was more excellent and scientific than Smith in trade theory.

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[11] For the process by which Ricardian theory gained popularity, see Rothbard (1995, Chapters 3 and 4).

> "He [Mr. Ricardo] showed, that the advantage of an interchange of commodities between nations consists simply and solely in this, that it enables each to obtain, with a given amount of labour and capital, a greater quantity of all commodities taken together. This it accomplishes by enabling each, with a quantity of one commodity which has cost it so much labour and capital, to purchase a quantity of another commodity which, if produced at home, would have required labour and capital to a greater amount. To render the importation of an article more advantageous than its production, it is not necessary that the foreign country should be able to produce it with less labour and capital than ourselves. [...] **It is not a difference in the *absolute* cost of production, which determines the interchange, but a difference in the *comparative* cost**" (J. S. Mill 1844, pp.1–2).

According to J. S. Mill (1844), the gain from trade is to be able to import more quantity at less expense and so, is neither to be a vent for surplus products nor to expand a market, such as in the *Wealth of Nations* by Smith, and a condition of trade is determined based on a comparative advantage. In addition, J. S. Mill considers that Ricardo discovered comparative advantage theory, because Mill writes "He [Mr. Ricardo] showed" at the beginning of the paragraph in the above-mentioned quotation. Therefore, on the contrary, the proponent of absolute advantage theory, which is one of two concepts, would be the person before Ricardo. By circumstantial evidence, it is suitable in thinking that the person is Smith, but he has not described that clearly. His these views were the same also in *Principles of Political Economy with some of their Applications to Social Philosophy* (1848), and in both works, he quoted the numerical example of England and Poland in father Mill's *Element* (J. Mill 1821, pp.120–21). Therefore, it is natural to consider that the recognition of theoretical disconnection between Ricardo and Smith began from James Mill and was taken over by his oldest son, J. S. Mill[12]. Moreover, the term "facility" was changed to the modern term "cost" by J. S. Mill. It was theoretically required for J. S. Mill to homologate the

[12] James and John Mill participated in a social study group in the house of Mr. Grote held twice a week with 12 members from the latter half of 1824. The text examined first was *Element* of James Mill, and the gain from trade was discussed. In addition, J. S. Mill's *Reciprocal Demand Theory* of international trade was incubated from these discussions in this study group (J. S. Mill 1873, pp. 119–121).

disconnection between Smith and Ricardo and to give Ricardo greater authority than Smith for his great purpose, such as the determination of trade condition. However, it has remained a *mystery* why James Mill and his son did not mention Smith in their criticism of absolute advantage theory.

The disconnection view that Ricardo was distinguished from other scholars before him in trade theory was strongly influenced by the high authority[13] of J. S. Mill at that time. In addition, there was a talented popularizer of J. S. Mill's theory. The popularizer was John Elliot Cairnes, who was often called "the last of the Classical economists". In Cairnes' works (1857, 1873, 1874), he made desperate efforts to enhance the role and authority of the classical economics that he studied through J. S. Mill, especially Ricardo's authority, to which J. S. Mill attached a high value, because it was necessary for him to oppose the marginal utility theory of William Stanley Jevons and the English Historical School. Therefore, Cairnes' criticism of absolute advantage theory and his admiration for comparative advantage theory were included in his activities.

> "Take another example from one of our greatest economic discoverers. One of the most important discoveries in Political Economy which has been made since the time of Adam Smith is the theory of foreign trade **established by Ricardo**. "Previous to this," as Mr. J. S. Mill observes, "**the theory of foreign trade was an unintelligible chaos**." **The discovery of Ricardo** was briefly this — he showed that the circumstance which determined an interchange of commodities between two nations was not, as had previously been supposed, **a difference in the *absolute* cost of producing the commodities exchanged, but a difference in the *comparative* cost**" (Cairnes 1857, p. 74).
>
> "the exchange of commodities among different nations is regulated, **not by the absolute, but by the comparative, cost of the commodities**" (Cairnes

[13] "The success of J. S. Mill's *Principles* was sweeping and much more general, also much more evenly distributed over all countries in which economics received attention, than was that of Ricardo's. This was primarily due to a happy combination of scientific level and accessibility: Mill did present analysis that satisfied competent judges, yet, barring very few points that proved stumbling blocks, every economist could understand him. The book's many editions measure only its direct influence." (Schumpeter 1954, p. 533). Mill's authority at the time, the number of copies of his book, and the fact that he won an overwhelming victory in the academic world, are detailed in de Marchi (1974) and Reeves (2007).

1873, p. 36).

"In the field of foreign trade, Adam Smith achieved important results, though mainly of a negative kind. His onslaught on the mercantile theory of wealth, and his advance from the destruction of that fetish to the establishment of the doctrine of Free Trade, are among his best-known exploits. Yet it is nevertheless true that **Adam Smith wholly failed to give a rational account of the principle** which occasions and governs the interchange of commodities between nations, and by consequence to explain in what consists, or what measures, the gain of foreign trade. […] the main tenor of his exposition of the nature and effects of foreign trade is nevertheless conceived distinctly from **the producer's stand-point**. […] On the whole, it must be said, in spite of some admirable maxims and pregnant hints which occur throughout the discussion, that **the theory of foreign trade, as developed in the "Wealth of Nations," constitutes a mass of confused thought and misapprehended fact**. The whole of this portion of the science was still essentially chaotic, and, notwithstanding the partial elucidations effected by M. Say in his exposition of the doctrine that "products are the markets for products," remained in this condition until here again the genius of **Ricardo**, by a few masterly generalizations, introduced order and light into the jarring elements. One of these, known to economists as the doctrine of "**comparative cost**," set forth, **for the first time, the fundamental conditions which determine the profitableness of international exchange**. Adam Smith's negative conclusions were not only corroborated but supplied with a basis in the general theory of the subject, while the small element of truth contained in the doctrine of the Mercantile school was ascertained and discriminated" (Cairnes 1873, pp. 292–294).

"when it is said that **international trade depends on a difference in the comparative, not in the absolute, cost of producing commodities**, the costs compared, it must be carefully noted, are the costs in each country of the commodities which are the subjects of exchange, not the different costs of the same commodity in the exchanging countries" (Cairnes 1874, p. 312).

According to Cairnes, trade should be considered not in terms of absolute advantage but in terms of comparative advantage, and trade theory was refined scientifically so that it was no longer "an unintelligible chaos" as a result of the discovery of comparative advantage theory by Ricardo. Moreover, the problem in

Smith's trade theory, such as a country without profits, was cleared up by Ricardo. J. S. Mill also distinguishes Ricardo from his predecessor and admired Ricardo's authority rather than Smith's. Such disconnection established by the Mills and Cairnes was accepted and prevailed widely at the time. For example, Walker (1883) states that J. S. Mill judged that comparative advantage theory was more adequate from a comparison of two concepts, and Bastable (1887) states that Smith organized trade theory logically for the first time, and states the first user of the term "comparative cost," as follows:

> "This expression was, *so far as I am aware*, first used by **J. S Mill,** in his Essays, p. 2; but the principle is substantially to **be found in Ricardo**, and is further worked out by **James Mill**, Elements, p. 88" (Bastable 1887, p. 16)[14].

Taussig (1889) quotes a passage from Cairnes' description about two concepts and states that Smith was *not* a comparative advantage theorist[15] (pp. 32–33). In *The Encyclopaedia Britannica* (1891), the terms of "absolute cost" and "comparative cost" are already used as the correct meaning in the explanation of trade theory and Ricardo is distinguished from his predecessor on the ground of J. S. Mill and Cairnes. The *Dictionary of Political Economy* (1894) describes "comparative cost" as a term used in trade theory and "relative cost" as a term used in value theory, with Cairnes and Bastable referred to in trade theory. Thus, in the second half of the 19th century, it was already described, even in a commonly used dictionary, that "an unintelligible chaos" in trade theory had been organized as a result of the discovery of comparative advantage and that situations in academic circles differed after Ricardo.

There were many rivals to classical economics, such as the Marginal Utility School, Marxian Economics, and the Historical School of England and Germany, but only the free trade thought with productivity differentials by Ricardo in the Smithian line had received widespread support from other schools. This situation was attributed to J. S. Mill's deliberate strategy[16], and because other

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[14] In 1903 editions, "so far as I am aware" changed to "probably." It seems that he investigated in his own way.

[15] However, he did not state either that Smith was an absolute advantage theorist.

[16] "[M]uch of the seeming confusion, muddle and moderation permeating Mill's *Principles* was a deliberate strategy designed to soften up and

schools were not always able to offer a sufficient scientific trade theory until Ohlin's work about international trade in 1933, although there was the infant industry argument, so that Ricardo's comparative advantage theory acquired the status of a doctrine of primary importance in trade theory. With the acquisition of this status, it can be seen how an incorrect recognition of disconnection between Smith and Ricardo in trade theory could come to be entrenched deeply in someone's subconscious.

However, although Ricardo made a contribution about the nature of the advantages derived from foreign trade, as we show, the theoretical break between Smith and Ricardo should not be over-emphasized. On this point, *only* John Kells Ingram of the English Historical School provided some moderate evaluation at that time.

> "A particular economic subject on which Ricardo has thrown **a useful light is the nature of the advantages derived from foreign commerce, and the conditions under which such commerce can go on.** Whilst preceding writers had represented those benefits as consisting in affording a vent for surplus produce, or enabling a portion of the national capital to replace itself with a profit, he pointed out that they consist "simply and solely in this, that it enables each nation to obtain, with a given amount of labour and capital, a greater quantity of all commodities taken together." [...] **It is, in short, not absolute cost of production, but comparative cost, which determines the interchange. This remark is just and interesting**, though **an undue importance** seems to be attributed to it by J. S. Mill and Cairnes, the latter of whom **magniloquently** describes it as "sounding the depths" of the problem of international dealings" (Ingram 1888, pp. 133–134).

It seems that Ingram felt the distinction had "undue importance" and "magniloquently," unlike Cairnes, who wished to add high authority to classical economics. Ironically, Ingram who criticizes classical economics evaluates the object properly because of his relativist viewpoint. Ingram's *A History of Political Economy* (1888) received a large readership and achieved success as the only textbook on the history of economic thought published in Great Britain in those

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conciliate the numerous enemies of Ricardianism and thereby to win their support for a covert reestablishment of Ricardian dominance" (Rothbard 1995, p. 279).

days, but Ingram did not have sufficient power to correct the theoretical break between Smith and Ricardo; moreover, he would have been disinterested in this point. The reason is that he had a high opinion of Smith, but Ricardo was an object of thorough criticism for him. As for Ingram, who did not undertake very formal research with regard to economics, Schumpeter is skeptical[17] about his expertise in economics, but it seems that evaluations of Ingram to J. S. Mill and Cairnes are appropriate and calm judgments about the situation of trade theory.

In spite of the success of Ingram's work, the academic evaluation, in which Smith did not consider Ricardo's situation, did not change even at the beginning of the 20th century. A famous work by Seligmaen about Torrens[18] was published in 1903, and then, there was controversy about the origin of comparative advantage theory (see Hollander 1910, 1911; Seligmaen 1911), but there was no positive focus on Smith. In the 19th century, scholars distinguished Ricardo from his predecessor, Smith, and held Ricardo up relatively as being the "discoverer of comparative advantage theory," but there was no literature that criticized Smith's trade theory *by name directly* as an absolute advantage theorist. Of course, there was a lot of literature that identified Smith as an absolute advantage theorist *indirectly* and *implicitly*, such as "absolute advantage theory had occupied the general trend in trade theory before Ricardo." In Hollander (1911), however, after he explained absolute advantage theory, it is highly noticeable that he took up Smith's *The Wealth of Nations* clearly for this category. This was probably the first work that mentioned Smith *by name* as the proponent of absolute advantage theory.

Taussig (1911) developed an argument by using two classifications[19] of "absolute cost differences" and "comparative cost differences." These "differences" are often used now. MacDonald (1912) and Gide and Rist (1915) declare that Smith had no concept of comparative advantage and his theory was imperfect in

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[17] "How was it possible for him to preach the gospel of a 'new economics' that took its methodology from Comte? The only answer I am able to offer—and which must suggest itself to any professional who makes a study of Ingram's History of Political Economy—is that **both his knowledge of economics and his interest in it did not go beyond general 'philosophies' that were inspired by generous enthusiasm for the great slogans of his day but never came to grips with real problems**" (Schumpeter 1954, p. 538).

[18] "Leser's comment [1881] attracted no notice, but some years later credit for priority in formulating the doctrine of comparative cost was again claimed for Torrens, this time by Professor Seligman" (Viner 1937, p. 442).

[19] In Taussig (1927), "equal cost differences" are added to these.

explanation. In Boddy (1918), a famous example of "typing" of comparative advantage theory emerges probably for the first time. Boucke's *The Development of Economics 1750–1900* (1921) compared various opinions of Smith and Ricardo using a table. In this table, Boucke uses determinate classifications, such as present-day literature, and refers to Smith as an absolute advantage theorist and Ricardo as a comparative advantage theorist on the issue of trade (see Boucke 1921, p. 114)[20]. Thereafter, there were several other books in the 1920s that based the history of trade theory on Ricardo, such as Angell (1926) and Simpson (1927).

In the 1930s, prominent achievements about international economics or international trade were published one after another. In Harrod (1933), there are explanations about absolute advantage, comparative advantage, and Ricardo as the discoverer of the latter, but no reference to Smith. Ohlin (1933) does not even consider the two theories at all. In Haberler (1936), there are both explanations of the two theories, and he attaches importance to Torrens about the origin of comparative advantage theory. Therefore, he complains that the pioneer of comparative advantage is connected to the name of Ricardo. However, in the 1930s, the most important person is probably Jacob Viner.

> "Under free trade, it was argued or implied, all products, abstracting from transportation costs, would be produced in those countries where their real costs were lowest. The case for free trade as presented by Adam Smith and the Physiocrats did not advance beyond this point" (Viner 1932, p. 359).

Apparently, Viner seems to admit that Smith is a proponent of absolute advantage theory. However, he states as follows:

> "In the exposition of the doctrine the "real" costs are expressed as a rule in terms of quantities of labor-time, but with the implication, as throughout the classical theory of value, that these quantities of labor-time correspond in their relative amounts within each country to quantities of subjective cost."

That is, because real cost corresponds to subjective cost, Viner does not compare physical productivity between countries.

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[20] However, he wrote "relative cost differences" instead of "comparative cost differences."

> "Dupuit, for instance, as late as 1861, expressly claim that **absolute advantage in costs** is necessary for trade, and that a country with absolute advantage in every commodity can derive no benefit from trade (E. J. Dupuit, *La Liberié commerciale, son principe et ses conséquences*. Paris 1861. pp. 67–80, 89). Dupuit deals with costs as a rule in money terms only, but does not appear to have seen that absolute advantages in money costs are consistent with absolute advantages in real costs" (Viner 1932, pp. 359–360, footnote 3).

His "eighteenth-century rule" (Viner 1937, p. 440) is often misunderstood as a rule which based on absolute advantage theory (see Thweatt 1976), but it is a rule in monetary terms. In other words, the 18$^{th}$-century rule is the logic that indicates the gains from trade independently of technical advantage. Of course, it is better for some countries to hold a technical advantage, but it is more important for them to buy cheaply rather than to hold a physical advantage.

> "In the beginnings of free trade doctrine in the eighteenth century, the usual economic arguments for free trade were based on the advantage to a country of importing, in exchange for domestic products, those commodities which either could not be produced at home at all or could be produced at home only **at costs absolutely greater** than those at which they could be produced abroad" (Viner 1932, p. 359).

Then, Viner states Ricardo's contribution as follows:

> "This explicit statement that imports could be profitable even though the commodity imported could be produced at less cost at home than abroad was, it seems to me, the sole addition of consequence which the doctrine of comparative costs made to the eighteenth-century rule. Its chief service was to correct the previously prevalent error that under free trade all commodities would necessarily tend to be produced in the locations where their real costs of production were lowest" (Viner 1937, p. 441).

Such as Ingram, Viner calmly considers J. Mill's view of disconnection between Smith and Ricardo.

Next, in the 1940s, and later, in Samuelson's *Economics* (1948) and

Kindleberger (1953), there are explanations of both theories, which recognize Ricardo as the discoverer of comparative advantage theory. They only accord Ricardo special treatment but do not state clearly that Smith was an absolute advantage theorist. Robbins (1958) is the important work of this time about the origin of comparative advantage theory, but here too, there is no consideration about Smith. The most important literature of this time is the *History of Economic Analysis* of Schumpeter (1954). His widow published the book after his death based on his posthumous writings, and it was very highly evaluated and had great influence as its precise analysis added to Schumpeter's fame as an economist. Schumpeter (1954) describes Smith's trade theory as follows:

> "**Neither did Adam Smith**, who seems to have believed that under free trade all goods would be produced where their **absolute costs in terms of labor are lowest**, though he no doubt co-ordinated, rounded off, emphasized, and illustrated. In fact there is nothing of importance to report for the rest of the century in spite of the mounting flood of popular literature, most of which was of free-trade or freer-trade complexion and strongly influenced the *Wealth of Nations*. And even that advance in the analysis of territorial specialization was not an unmixed gain. Both the anonymous author and Gervaise were much too ready to arrive at conclusions agreeable to their free-trade opinions and in so doing associated their achievement with errors of reasoning that were to become typical in the free-trade literature of the nineteenth century." (Schumpeter 1954, pp. 374–376).
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> "The second contribution, as everybody knows, was the theorem of Comparative Costs. As Professor Viner (op. cit. p. 440) has pointed out, **A. Smith never went beyond stating that under free trade everything would be produced in the place where costs (taking account of transportation costs) were lowest.** He also has pointed out that some earlier writers had formulated the more general proposition that, under free trade, commodities would be imported whenever they can be obtained **most cheaply** in this way" (Schumpeter 1954, p. 607).

Schumpeter states "**absolute costs in terms of labor**" and "**most cheaply**," but does not state the assumption that real cost corresponds to subjective cost in the classical school, like Viner. Thus, he confuses the reader about the comparison, which is in terms of physical productivity or monetary affairs. However, he admits

the disconnection between Smith and Ricardo à la the Mills. Moreover, Schumpeter as well as previous theorists, including Cairns and Viner, connected the problem about the gain from trade, namely, profits from imports or exports, to the two theories. Schumpeter declares that there were already traces of comparative advantage theory before Smith, and he isolates only Smith in the history of economic thought. By doing so, he makes an important contribution to the formation of the urban legend.

However, the distinction between the two theories should be essentially different from the issue of the great source of profit in trade, which is derived from imports or exports. Rather, the matters should be considered including all aspects. Although Smith puts weight on the side of exports as the source of profits, this fact does not necessarily mean that he is an absolute advantage theorist. On the other hand, for the same reason that Ricardo puts weight on the side of imports, it can never be said that Smith does not have a view of comparative advantage and that Ricardo is superior to Smith in trade theory. This is based on the reasons that Ingram (1888) describes, namely, that "Ricardo has thrown a useful light is the nature of the advantages derived from foreign commerce, and the conditions under which such commerce can go on" on Ricardo's trade theory. In addition, Ingram reviews the appreciation of Ricardo by J. S. Mill and Cairnes as "interesting," but of "undue importance" and "magniloquently." The important point to note is that Ingram refers to "a useful light," but the point does not refer to the whole trade theory.

After Schumpeter (1954), Harris (1957), Wells (1969), and Myint (1977) refer to Smith as an absolute advantage theorist. Samuelson states "Ricardo's name was certainly used as a rallying cry for the school that favored freer trade in England. But Smith had already made the needed points," but goes on to say that "his (Ricardo's) greatest tour de force was the theory of comparative advantage" (Samuelson 1962, p. 9)[21]. That is to say, Samuelson distinguishes Ricardo from Smith in the history of economic thought about trade theory because he is affected by Schumpeter. Indeed, Samuelson states "my old teacher Schumpeter," and mentions Schumpeter (1954) in his presidential address.

## 4. Background to the preparation of the legend

[21] Presidential address delivered at the 74th Annual Meeting of the American Economic Association, New York, December 27, 1961. This address was published in the *American Economic Review* in 1962.

As shown in Sections 2 and 3, it is widely believed that Smith advanced an absolute theory of comparative advantage. However, there is no material evidence that Smith considered absolute advantage theory and we have counterexamples that he did not. Consequently, it is merely urban legend that continued for a long time through the poor habit of textbook writers who repeated "common knowledge" without confirming the original text. Our scrutiny clarifies that this legend was first stated explicitly in the 1910s and spread after the 1920s. Have all questions concerning the legend been solved? In our opinion, an important question remains. Why did this legend survive for such a long time? Even if the legend spread widely in the 1950s, it continued to be believed and was not corrected for more than half a century. As a result, there must be some serious misinterpretations concerning Ricardo's theory of comparative advantage.

One of most conspicuous misinterpretations of Ricardo's text was made clear by Ruffin (2002) and Maneschi (2004)[22]. It is now clear that Ricardo assumed the wine that required the labor of 80 men a year in Portugal was exchanged for cloth that required the labor of 100 men in England. If that amount of cloth was exchanged for wine that required 120 men in England, it would be advantageous for England to engage in foreign trade. Likewise if Portugal exchanged that amount of wine for cloth that required the labor of 90 men in Portugal, it would be advantageous for Portugal.

Another source of misinterpretation is related to the rule of specialization that Viner named the 18$^{th}$-century rule. Although Viner (1937) provides an exact description of the rule, the denomination is highly misleading. As Meoqui (2011) puts it, the name suggests "a different rule of specialization was formulated later in nineteenth century." In addition, the expression had a pejorative connotation and became the origin of other misinterpretations of Ricardo's theory. We prefer to refer to a classical rule of specialization after Meoqui (2011, 2014). The classical rule of specialization was expressed by Viner as:

> "the rule, ..., that it pays to import commodities from abroad whenever they can be obtained in exchange for exports at a smaller real cost than their production at home would entail." (Viner 1937, p. 440)

[22] This is noticed and explained in detail by Yukizawa (1972) in Japanese and remained unknown in the English-speaking world. See Fujimoto and Shiozawa (2011, p. 29, note 23) and Tabuchi (forthcoming).

Ricardo's arguments are the same as the classical rule of specialization, because he claims it is advantageous for England to import wine from Portugal that would entail the labor of 120 English men for a year in exchange for exports of products that require 100 men for the same time. However, this rule has not been understood correctly and has been cited wrongly as expressing absolute advantage theory.

For example, as late as 1996, Irwin (1996, p. 89) explains the 18th-century rule as a "notion that imported goods could be acquired more cheaply abroad because the absolute production cost was lower than at home." This explanation contains two problems. First, Irwin tacitly and wrongly changes the costs that should be compared. Viner compares the cost of producing the commodity that would be exported with the cost of producing at home the commodity that would be imported and exchanged with the exports. Irwin compares the costs of the same commodity at home and abroad. This is a complete error in understanding the classical rule of specialization. Second, the statement is ambiguous because we can interpret the phrase "absolute production cost" in different ways (we discuss later a different interpretation of this phrase). However, this ambiguity is removed when we see how Irwin explains the theory of comparative advantage as follows. "This theory stated that certain goods could be advantageously imported from abroad *even if* the home country had an absolute cost advantage in producing the good" (*Ibid*., p. 90).

The absolute production cost for Irwin must be, for example, production coefficients. If Irwin understood the classical rule of specialization in this way, he was interpreting it as a variant of absolute advantage theory. If this interpretation were to continue, people who expressed the classical rule of specialization would continue to be interpreted as proponents of absolute advantage theory. If we (mis)understand that Smith shared Irwin's version of the classical rule, then Smith must be one of those absolute advantage theorists. This understanding of the rule is wrong and we soon explain how the classical rule of specialization has been the background to the erroneous misinterpretation of Smith as an absolute advantage theorist.

We do not claim that there was no person who interpreted the classical rule of specialization correctly. The author of the 18th-century rule, Viner, understood the rule correctly, as he commented:

> "Such gain from trade is always possible when, and is only possible if, there are comparative differences in costs between the countries concerned. The

> doctrine of comparative cost is, indeed, but a statement of some of implications of this rule, and adds nothing to it as a guide for policy." (Viner 1937, p. 440)

Why did this correct indication turn into a wrong understanding and prepare the road for the widespread legend that Smith was an absolute advantage theorist? This problem does not stay within the narrow problem of text reading, but concerns the whole system of Ricardo's theory. As Faccarello (2013) rightly points it, the story around the four magic numbers is a part of the whole theory of international trade. Many of the misinterpretations occur because of the fact that many researchers interpret the comparative advantage theory to be complete. Ricardo himself knew well that his theory was incomplete, as he admits that "[t]he 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" (Ricardo 1817, p. 133). Various enigmas concerning comparative costs and patterns of specialization can be interpreted correctly by a recent development of Ricardian theory of international trade.

As this study is not the place to develop the whole theory, we must content ourselves with providing only a summary explanation that is closely related to the subject matter of this study. In our understanding, what is seriously lacking in the traditional examinations of Ricardo's theory of comparative advantage is the examination of wage rates. If we take into account that wage levels differ according to countries, many of the ambiguities disappear.

Ricardo mentions 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." (*Ibid*., p. 137) This situation can be expressed by the following conditions:

$$100\ wE < pC \qquad \text{and} \qquad 80\ wP < pW. \tag{4-1}$$

Here, $wE$ and $wP$ are the wage rates for England and Portugal, respectively, and $pW$ and $pC$ are the (international) prices of wine and cloth, respectively. If cloth is sold in Portugal at $pC$ but Portuguese cloth producers cannot compete with the imported cloth and English wine producers cannot compete with the imported wine, then we obtain

$$pC < 90\ wP \qquad \text{and} \qquad pW < 120\ wE. \tag{4-2}$$

If the two conditions (4-1) and (4-2) are satisfied, it follows that

$$100\ wE < pC < 90\ wP \quad \text{and } 80\ wP < pW < 120\ wE. \tag{4-3}$$

Then, it also follows that

$$80 / 120 \quad < wE / wP < 90 / 100. \tag{4-4}$$

The inequality (4-4) indicates that the wage rates of England and Portugal cannot be equal if compared by the same numéraire.

If we take into account that wage rates are not necessarily equal, it is evident that the meaning of cost must be interpreted accordingly. What does it mean when Irwin (1996) states that "the absolute production cost was lower [abroad] than at home"? If he means in the case of Ricardo's four numbers that

$$100\ wE < 90\ wP \quad \text{and } 80\ wP < 120\ wE,$$

then, he is completely right in claiming that the difference of absolute production cost is lower in the exporting country than in the importing country. However, as we noted above, Irwin interprets the "absolute production cost" as input coefficients. This means he claims that

$$100 < 90 \text{ and } 80 < 120.$$

Evidently, this is a complete error.

It is important to note that Viner's version of the 18$^{th}$-century rule still holds. The rule compares the real costs (or labor) that would be necessary to produce two commodities that would be exchanged at international prices. Ricardo assumes that an amount of cloth would be exchanged with a certain amount of wine and assumes that input labor would be by four numbers. Thus, the 18$^{th}$-century rule claims that

$$100 < 120 \text{ for England and } 80 < 90 \text{ for Portugal,}$$

which is apparently true. Even if the exchange ratio is not one to one, by the predetermined units that Ricardo has chosen, the classical rule of specialization holds, provided that inequalities (4-1) and (4-2) are satisfied. Take an amount of money $M$ that would be the value of commodities to be exchanged. Then,

$$pC\ M\ /\ (90\ wP) < pC\ (M\ /\ pC) = M = pW\ (M/\ pW) < M\ pW\ /\ (80\ wP).$$

Cancelling the common factor $M\ /\ wP$ off both ends, and taking the reciprocals, we obtain

$$80\ /\ pW < 90\ /\ pC. \qquad (4\text{-}5)$$

Both sides of the inequality are the labor required to produce commodities of the same international value when prices are given by $pC$ and $pW$. This is but the classical rule of specialization for England. We can obtain a similar result for Portugal too.

Viner clings to the idea that the comparison should be made in real terms (see the usage of the term "real cost" in his expression of the 18th-century rule.). However, we can obtain a more tractable and more general form for the rule. If we assume that wage rates are everywhere equal, or in all industries equal, then the classical rule of specialization is

$$aEI\ /\ pI < aEJ\ /\ pJ, \qquad (4\text{-}6)$$

where $aI$ and $aJ$ are the labor input coefficients to produce a unit of commodity in one country and $pI$ and $pJ$ are the international prices. If the wage rate is $wE$ in England for industries I and J, then the money costs in England for the production of two commodities are

$$aEI\ wE\ /\ pI < aEJ\ wE\ /\ pJ.$$

Using similar conventions, we obtain for Portugal

$$aPJ\ /\ pJ \quad < aPI\ /\ pI, \qquad (4\text{-}7)$$

and

$$aPJ\ wP / pJ < aPI\ wP / pI$$

as a corollary to (4-7).

If England exports commodity I and the international price of I is equal to the cost of English production, including profit, this means that

$$pI = aEI\ wE.$$

Similarly, we have for commodity J

$$pJ = aPJ\ wP.$$

These inequalities imply that

$$aEI\ wE = pI < \quad (aPI\ wP)/\ \{aPJ\ wP / pJ\} = aPI\ wP.$$

The monetary production cost of commodity I is smaller in England than in Portugal. A similar monetary production cost inequality holds for commodity J. Consequently, we obtain

$$aEI\ wE < aPI\ wP \quad \text{and} \quad aPJ\ wP < aEJ\ wE. \qquad (4\text{-}8)$$

Thus the classical rule of specialization, i.e. inequality (4-6) and (4-7) imply inequality (4-8), which is a rudimentary rule that the country with the cheaper cost of production will exports commodities to the countries with higher cost of production.

This rule was supported explicitly by Smith when he claimed the following:

"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." (Smith 1776, vol. 1, p.423)

This rule was defended by the following reasoning:

"It is the maxim of every prudent master of a family never to attempt to make at home what it will cost him more to make than to buy." (*Ibid*., vol. 1, p. 422)
"What is prudence in the conduct of every private family can scarce be folly in that of a great kingdom." (*Ibid*., vol. 1, p.423)

Smith applies the reasoning of household economics to the economic policy of a nation. If we understand that Smith's rule refers to "real cost" or labor input coefficients, Smith's claim is no different to absolute advantage theory. However, it is clear that Smith argues in money terms, and that in money terms, the classical rule of specialization, in Viner's version, is equivalent to Smith's rule. Irwin's misunderstanding lies only in the fact that he used "absolute production cost" as real. In the 18th century, the term "cost" had two meanings. One is what we term real cost. The other is monetary cost. Smith's contention can be interpreted simply as speaking of monetary costs and in this interpretation, Smith's rule and the classical rule are, in fact, equivalent.

The two rules are mathematically equivalent. We have proved that (4-6) and (4-7) imply (4-8). Conversely, inequality (4-8) implies (4-6) and (4-7) if we understand that

$$pI = aEI\ wE \quad \text{and } pJ = aPJ\ wP, \tag{4-9}$$

or, put differently, the prices are chosen from among the least ones. The proof is easy. From (4-8) and (4-9), we obtain

$$pI = aEI\ wE \quad \text{and} \quad pJ < aEJ\ wE.$$

Then, it follows that

$$aEI / pI = 1/ wE < aEJ / pJ.$$

In the same way, from

$$pJ = aPJ\ wP \quad \text{and} \quad pI < aPI\ wP,$$

we obtain

$$aPJ / pJ = 1 / wP = aPI / pI.$$

Thus, it is proved that (4-6) and (4-7) are equivalent to (4-8) and (4-9), respectively. This equivalence theorem can be extended to a general M-country, N-commodity Ricardian trade economy (see Shiozawa 2015a, Section 5).

It remains for us to examine the relationship between the classical rule of specialization and comparative advantage theory. If we multiply inequalities (4-6) and (4-7) member by member, we obtain

$$aEI\ aPJ / pI\ pJ < aEJ\ aPI\ /pI\ pJ.$$

Eliminating common factors, we obtain

$$aEI\ aPJ < aEJ\ aPI. \qquad (4\text{-}10)$$

We can also obtain the same result from (4-8). The inequality (4-10) is equivalent to the following two inequalities

$$aEI / aEJ < aPI / aPJ \quad \text{or} \quad aEI / aPI < aEJ / aPJ. \qquad (4\text{-}11)$$

Although these inequalities are all mathematically equivalent conditions, their meanings, or more appropriately, their viewpoints, are a bit different. For example, the left inequality of (4-11) compares two ratios of different industries of the same country, whereas the right inequality compares the ratios of different countries of the same industry. The left inequality may be useful for a person in administration or a researcher. The right inequality may provide a reference point to managers in a multi-national firm (see Fujimoto and Shiozawa 2011, 2012b, Section 2).

Either of the conditions (4-10) and (4-11) is a familiar case, and is well known as a condition that provides a pattern of specialization. In this case, England specializes in commodity I and Portugal specializes in commodity J. These conditions are not only because they provide a pattern of specialization but also because they are sufficient conditions for the existence of a wage rate vector (wE, wP) that satisfies (4-8) and (4-9). Either one of them is also a sufficient condition for the existence of a price vector (pI, pJ) that satisfies (4-6) and (4-7).

This existence theory is not difficult because it is sufficient to find positive

wE and wP that satisfy the inequalities

$$aEI / aPI < wP / wE < aEJ / aPJ. \qquad (4\text{-}12)$$

Indeed, if we obtain (4-12), it is easy to derive (4-8). In the same way, it is evident that positive pI and pJ exist, which satisfy inequalities

$$aEI / aEJ < \quad pI / pJ \quad < \quad aPI / aPJ. \qquad (4\text{-}13)$$

Then, it is easy to observe that pI and pJ satisfy (4-6) and (4-7), respectively.

Thus, a two-country, two-commodity case is quite easy. In a more general N-country, N-commodity case, it is known that the Jones condition provides a similar result. The Jones condition is satisfied when

$$a1\sigma(1)\cdot \ \dots \ \cdot aN\sigma(N) < a1\tau(1)\cdot \ \dots \ \cdot aN\tau(N) \qquad (4\text{-}14)$$

for some permutation $\sigma$ of the N-element set {1, 2, ..., N} and for all other permutations $\tau$ of the same type. If the Jones condition (4-14) holds, a positive vector w = (w1, ... , wN) exists that satisfies inequalities[23].

$$\begin{aligned} &w1\ a1\sigma(1) < w2\ a1\sigma(1),\ w3\ a3\sigma(1),\ \dots\ ,\ wN\ aN\sigma(1) \\ &w2\ a2\sigma(2) < w1\ a1\sigma(2),\ w3\ a3\sigma(2),\ \dots\ ,\ wN\ aN\sigma(2) \\ &\qquad\qquad \cdot\ \cdot\ \cdot \\ &\qquad\qquad \cdot\ \cdot\ \cdot \\ &wN\ aN\sigma(N) < w1\ a1\sigma(N),\ w3\ a3\sigma(N),\ \dots\ ,\ wN\ aN\sigma(N). \end{aligned} \qquad (4\text{-}15)$$

Note that we can take

$$p\sigma(1) = w1\ a1\sigma(1),\ p\sigma(2) = w2\ a2\sigma(2),\ \dots\ ,\ p\sigma(N) = wN\ aN\sigma(N).$$

Then, we can obtain similar inequalities with prices and input coefficients. This result is a simple generalization of the two-country, two-commodity case to the N-country, N-commodity case.

When (4-14) or equivalently (4-15) hold, wage and price vectors have a

[23] For a proof of this theorem, see Shiozawa (to appear).

freedom of degree N (or degree N−1 if we deem proportional vectors to be identical). This case is famous and has attracted much interest but we must be aware that it is a very special case, known as the case of complete specialization (the state in which every country specializes in a commodity). If the economy produces all commodities, this state occurs only when $M \geq N$ because each country has one specific commodity assigned to it. Here, M is the number of countries and N is the number of commodities. As in the real world, the number of commodities far exceeds the number of countries, and so, we have to be aware that the N-country, N-commodity case is only imaginary.

In a more general case of an M-country, N-commodity economy, we obtain a slightly weaker result, as follows.

Theorem 4.1 Existence of admissible international value
For any M-country, N-commodity Ricardian economy (A, q) and final demand d in the world production frontier, a positive vector v = (w, p) exists that satisfies the following conditions:

(1) $w (\times) A = p$

(2) $s I = d$

(3) $s A \leq q$

(4) $\langle w, q \rangle = \langle p, d \rangle$.

Moreover, if d lies in the interior of a facet of a production possibility set, vector v is unique up to scalar multiplication and remains constant as far as demand d stays in the interior of the same facet.

Here, $A = (a_{ij})$ is an $M \times N$ matrix of labor input coefficients, $q = (q_i)$ is a vector of the labor forces of each country, $d = (d_i)$ is a vector of products, $w = (w_i)$ is a wage rate vector, measured in a common currency, $p = (p_j)$ is a price vector, $s = (s_{ij})$ is an activity vector that provides the production level for activity (i, j), that is, production of commodity j in country i, and I is a matrix that assigns the sums of various products. The term $w (\times) A$ is a special type of matrix multiplication that is in an ordinary expression

(min_i {wi ai1}, min_i {wi ai2}, … , min_i {wi aiN}).

The equation in (1) shows that inequalities similar to (4-13) are satisfied with only a relaxation in which strong inequality < is replaced by weak inequality ≤. Condition (4) together with conditions (1) and (2) imply that sij is positive only if wi aij = pj, that is, if the activity technique is competitive with respect to w and p.

We omit the details. Those who are interested are referred to Shiozawa (2015a). The theorem can be generalized into the case of the Ricardo–Sraffa trade economy, in which material inputs are traded among countries (see Shiozawa 2014, 2015b, 2016).

In the case of the Ricardian trade economy, we can add a proposition that for each facet of the world production frontier, a pattern of specialization named competitive type is defined and forms a spanning tree, provided that A is in a general position. This means that for almost all matrixes A, an international value exists and all countries gain from trade except for the case in which all industries of a country are competitive. In addition, this means that there is no necessity that a country with absolute advantage in a commodity exists profitably in international trade.

Furthermore, a converse of the previous proposition holds. If a spanning tree is a competitive type that has an international value v that satisfies condition (1), then the value is unique up to scalar multiplication and equation (4) provides a supporting hyper-plane of a facet of the production possibility frontier.

Thus, the specialization problem and the wage and price vector determination problem are simultaneously solved for all types of Ricardian trade economy that is in a general position. In this very general situation, Smith's rule holds, whereas the classical rule of specialization is difficult to formulate for general cases. In addition, these results imply that almost all problems posed by Faccarello (2013) have been solved already.

These recent results shed new light on the interpretation of many of Ricardo's problems and eliminate many wrongly sustained misunderstandings with respect to the classical rule of specialization, absolute advantage theory, and the true nature of comparative advantage theory.

There has been a long tradition to define comparative advantage in real terms. There was even an understanding that prices, money costs, or money expenses of production have nothing to do with the comparative cost principle

(Viner 1937, VIII.91). It is true that comparative advantage is defined in the two-country, two-commodity case. The inequalities in (4-10) and (4-11) are expressed only in real terms. In terms of "a chain of advantage," we could generalize the formulation to a two-country, many-commodity case and a two-commodity, many-country case (Haberler 1936; Viner 1937; Deardorff 2005). However, "although comparative advantage provides rather strong predictions of trade patterns in simple cases," as Deardorff (2005, p. 1010) admits, "it fails to do so in models that allow for even a small amount of realistic complication." What is the utility of the theory of comparative advantage? Deardorff argues that it explains gains from trade but this is a poor excuse because he states that "an important part of the gains-from-trade result has nothing to do with comparative advantage." (Deardorff 2005, p. 1010)

It seems there is no hope for comparative advantage. This is true if we continue interpreting comparative advantage in real terms. However, there is another possibility, which is to abandon reason only with real terms. Theorem 4.1 and its corollaries show us that if we use money terms, such as wage rates and prices, it is possible to formulate comparative advantage in a very wide class of economies. Costs in money terms, including profits after Ricardo, are compared in Theorem 4.1 and corollaries. The equation in condition (1) compares unit labor costs and prices in money terms. It is required simply to switch from real-term analysis to money-term analysis.

If comparative advantage is to be formulated in money terms, we have to abandon the long tradition that comparative advantage is to be examined in terms of real costs. It is true that Ricardo makes comparisons in real terms when he examines the four numbers. This does not imply that he excludes from his theory of international trade any analysis in money terms. In fact, Ricardo considers and explains in money terms in various places (see, e.g., the quotation cited before (4-1)). The latter two thirds of Ricardo's "On Foreign Trade" chapter examines the exchange ratio and subsequent variations of prices. The misunderstanding occurred because Ricardo could not present his theory of international values. In other words, Ricardo could not provide a firm theory about how values (wage rates and prices) are determined. Even in this incomplete state of the theory, there are many subjects that can be examined and the case of four magic numbers was one of them. Ricardo could explain persuasively that trade is advantageous to both trading countries, even in the case in which one country has absolutely inferior production techniques.

If we understand costs in comparative cost theory in money terms, the

meaning of comparative cost must change. The comparative cost principle simply tells us that the country whose money cost of production is lowest will export its product. No difference exists between the principles in domestic exchange and international exchange. When a country has inferior production techniques for all commodities, it will have a low (relative) wage rate and it can export relatively advantageous commodities. In this adjustment, wage rates play a crucial role. In the case of the four magic numbers, England is inferior to Portugal in both cloth and wine production and this is the reason why the English wage rate is lower than the Portuguese wage rate, as (4-4) shows. If we examine this in money terms, Smith's rule is no different from the comparative cost principle. Up to now, the two terms "comparative advantage" and "comparative cost" have been used interchangeably. It would be appropriate to distinguish the two and rename Smith's rule the comparative cost principle. The comparative advantage principle must be used when we refer to the formulation in real terms. Then, the comparative cost principle holds for all the Ricardian trade economy and, in fact, for all the Ricardo–Sraffa trade economy. If we make this distinction, we can say that the comparative cost principle is valid for a wide class of international trade, whereas the comparative advantage principle must be confined to a very narrow situation, such as the two-country and two commodity case, or the Jones case, and the other case (that includes Dornbusch-Fischer-Samuelson (1977) with a continuum of goods).

Writers before and even after Smith are ambiguous when they speak of "cost" and "labor cost" in particular. These terms may refer to money cost or real cost. In many cases, we have to assume that those writers were not aware of the existence of this ambiguity. This provided the background to almost all subsequent misunderstandings and misinterpretations. The comparative advantage principle in the sense defined above has helped to perpetuate this ambiguity and to open bring about a new kind of misunderstanding because it can be applied only to a very restricted situation. Much of this confusion can be eliminated if we firmly distinguish between the two different theories.

**Section 5. Lessons from the legend**

We examined first if Smith really argued according to absolute advantage theory and established that he did not (Section 2). We examined when this baseless attribution arose (Section 3). We found that the explicit claim is rather new and spread widely after World War II, when it came to be taught in classrooms. This means that certain forces continue to re-enforce this kind of misunderstanding. In

addition, we examined the background to these misconceptions (Section 4).

In these examinations, we found that there are many misinterpretations with respect to classical and pre-classical trade theory. Many of them must have occurred because classical and pre-classical writers confused ideas. However, some serious misinterpretation appeared from the very nature of trade theory. In quoting some important misinterpretations, we compile the following list:

(1) the "deformed interpretation" of Ricardo's reasoning on the gains from trade (Yukizawa 1972; Ruffin 2002; Maneschi 2004);

(2) allegations that Smith was not an absolute advantage theorist (this study);

(3) misunderstanding or inaccurate citations of the 18$^{th}$-century rule (Irwin 1996);

(4) Misunderstanding that the comparative cost principle has nothing to do with prices or wages and should be treated only in real terms (see Viner 1937);

(5) Ricardo's theory of international trade is complete in the form provided; and

(6) The theory of international trade in the Ricardian tradition has ceased to be a subject of research in its own right (Ethier 1999, p. 764).

Points (5) and (6) are apparently contradictory. All the misunderstandings except (6) seem to be re-enforced by the unsatisfactory state of the present theory of international trade. Scrupulous reading of original texts is crucial in ascertaining the correct history of economics doctrines, but the reinterpretation of old theoretical observations from the standpoint of more advanced theory is also important because it is one of major forces that re-enforces various misunderstandings of the theory itself.

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