

Remarks on Static and Dynamic Features of “Comparative Advantage”

Ronald W. Jones

University of Rochester

To introduce my remarks on comparative advantage, a concept playing a basic role in the theory of international trade, let me quote from Paul Samuelson on the occasion of his Presidential Address, “The Way of an Economist” to the Congress of the International Economic Association in Montreal in 1968.

“..years ago ...I was in the Society of Fellows at Harvard along with the mathematician Stanislaw Ulam,.....already at a tender age a world famous topologist. He used to tease me by saying, ‘Name me one proposition in all of social sciences which is both true and non-trivial’. This was a test I always failed. But now, some thirty years later,...an appropriate answer occurs to me: The Ricardian theory of comparative advantage;That it is logically true need not be argued before a mathematician; that it is not trivial is attested by the thousands of important and intelligent men who have never been able to grasp the doctrine for themselves or to believe it after it was explained to them.” (p. 683, vol. III of the Collected Scientific Papers of Paul Samuelson).

Now turn back to Ricardo’s discussion of comparative advantage in 1817. He used a numerical illustration, a mode of analysis that remained popular in discussing comparative advantage and properties of trade for more than a century. Consider the two countries he used: Portugal and England, and the four famous numbers that were used to describe production patterns of two commodities, wine and cloth, in each country. The numbers refer to the quantity of labor required to produce a unit of each commodity in each country. Ricardo’s numbers are 80 for wine and 90 for cloth in Portugal and 120 for wine and 100 for cloth in England. If the numbers for producing cloth were switched around in the two countries so that in Portugal it would take 100 units of labor to produce a unit of cloth while in England it takes only 90 units of labor to produce a unit of cloth, each country would have an *absolute* advantage in producing a particular commodity – Portugal would be a more efficient wine producer ($80 < 120$) but England would have an absolute advantage in producing cloth ($90 < 100$). In such a “switched” world it is easy to see that a trade pattern in which Portugal exports wine to England in exchange for English cloth would result in both countries gaining from

international trade. This is trade based on each country possessing an *absolute* advantage in the commodity it exports. What was at that time less obvious was that if, as Ricardo assumed, Portugal maintained a cost advantage in wine production but also had an *absolute* advantage in cloth production, using only 90 units of labor compared with 100 units of English labor to produce a unit of cloth, it would then *still* make sense for international trade to exhibit the exchange of Portuguese wine for English cloth, and *both* countries would once again gain from trade. The potential problem is that Portugal would then have an absolute advantage over England in *both* of the two commodities. Although Portugal's advantage in wine production would relatively exceed its advantage in cloth, why would Portugal wish to import cloth from England if it could, instead, produce its own cloth? Or how could English labor compete with that of Portugal in making cloth, much less wine? It was Ricardo's reasoning that leads to one of the most important propositions in the theory of trade: Each country has a *comparative* advantage in producing one commodity (Portugal in wine and England in cloth) even if one of the countries has an *absolute* advantage in both. International trade based on *comparative advantage* can also take place even if one country's labor force is more efficient in both activities. Of course this would only make sense in real-world markets if the wage rate earned by Portuguese laborers exceeded that earned by English labor. Such wage discrepancy is possible when, as Ricardo and subsequent trade theorists assumed, *labor is assumed to be immobile* between countries. It is this immobility that requires in free trade between countries a higher wage paid to Portuguese labor (than to English labor) not to result in a rush of English labor to the Portuguese market.

A more general discussion of the role of comparative advantage would compare the *relative prices* of the two commodities when each country is in *autarky*, i.e. before any international trade is allowed. Thus in the Ricardian scenario, the autarky *relative* price of cloth (i.e. the amount of *wine* that would have to be given up in England in the market to obtain a single unit of cloth) is p_C^E/p_W^E , which is lower than cloth's relative price in autarky in Portugal, p_C^P/p_W^P , or, given Ricardo's numbers, 100/120 is less than 90/80. One advantage of this more general formulation is that it can represent a much wider range of explanations of pre-trade commodity price ratios. For example, in a Heckscher/Ohlin context in which, say, capital is required (in addition to labor) to produce either commodity, the general endowment of each productive factor as well as its relative intensity of use in the two commodities helps to determine in the market in autarky the relative price of one good in terms of the other.

Key to the difference between *comparative* advantage and *absolute* advantage is the kind of situation found frequently in international trade: A pair of countries might engage in free trade with each other in final commodities, but do not allow exchanges or international movement in the factors of production. Leave aside for the moment current exceptions found in world markets: In the European Union much movement of labor as well as capital is allowed among

member countries, just as in countries such as the United States a (small) amount of such movement in labor is allowed legally, and, as well, there exists more than a small amount of illegal movement, say from Mexico. Similarly, capital to some extent is also internationally mobile, and indirectly there is also trade in intermediate products that is a reflection of possible fragmentation of production processes internationally that emerge if the costs of arranging international movements of parts and components can be lowered in *service link* activities (such as communication and transportation). Nonetheless, most of classical international trade theory develops models that make a sharp distinction between those final commodities that are assumed to be costlessly mobile among countries and inputs into the production process that are not. Of course trade theory has, even years ago, examined exceptions to the sharp distinction, such as allowing real capital movements to exist between two countries, the amounts (and directions) of such movements depending upon changes in relative commodity prices. In such a model two different questions are asked: For labor in each country (mobile between two sectors but not internationally) the question is: In which sector in my country do I have a comparative advantage, i.e. (*what do I do?*). By contrast, for internationally mobile capital (whether or not mobile between sectors) the question is "*where (in what country) do I go?*". Variations are examined as well for commodities: exploring the difference between *tradeable* commodities and *non-tradeables*. Nonetheless, in the classical competitive models, whether Ricardian, Heckscher-Ohlin, or the Specific-Factors model, the central versions allow free trade in commodities but no international mobility of input factors. In such markets the relevance of *comparative advantage* is quite natural.

Does the relevance of comparative advantage exist only for international trade in which no international factor mobility is allowed? Not if within countries there exist features that make movements from one *region* to others difficult for some factors of production. Such features include language differences, cultural differences, or variations in costs of living that could prevent a worker, say, who has an absolute advantage in some productive activity from moving to a region in which he could receive a higher wage than in his own region only if his absolute advantage is sufficiently great.

Does the move from autarky to free international trade make countries better off? The answer provided by trade theory, where trade reflects comparative advantage in each country, is breath-taking to many students of economics as well as to the general public: *all* countries *gain* by such trade. Why? The basic argument is simple: trade gives countries more choices *additional* to the one provided in autarky. (In the words of financial economists, trade allows more *options*). The fact that all countries gain seems at odds with the view that most changes lead to losers as well as to gainers – many situations are characterized as *zero-sum* games. Later I discuss two important provisos: (i) In the autarky state there will be lots of local trade with many buyers and sellers, with many losers as well as winners in markets that after trade

display differences in prices compared with autarky. Could the winners compensate the losers so that everyone gains? Yes, even though this is rarely done.¹ (ii) Once countries are engaged in international trade, changes that affect world market prices affect every country's aggregate real income through changes in the *terms of trade*. There will be losers as well as gainers when comparing one *trade* situation with another. The losers will be those within the country experiencing a deterioration in their terms of trade (compared with autarky).

The more technical kind of argument economists use to prove that free trade compared with autarky is beneficial to both countries starts with the *criterion* that is sufficient to establish gains from trade: The country gains if the value of overall consumption at free-trade prices exceeds what the value of the consumption bundle in autarky would be *if measured at those free trade prices*. (Otherwise the free-trade consumption bundle would not be chosen). The autarky set of market prices also has a role to play. Assuming that the pattern of trade does indeed lead to gains, why was the pattern of consumption that emerges with trade not selected in the autarky state? Because if measured by autarky prices it cost too much. These remarks eventually lead to an important conclusion about the nature of trade that leads to gains: On average a country tends to import commodities that are lower priced in the free trade situation than they were in autarky. If there is only a pair of commodities consumed in both states, such as wine and cloth in the Ricardian scenario, each country gains by importing the commodity in which it has a comparative disadvantage (i.e. the commodity that is relatively less expensive with trade). In a scenario in which many commodities are produced and consumed, an item-by-item comparison of free trade prices with autarky may not reveal the array of exports and imports with trade because of uneven substitutability and complementarity effects both in demand and production. But a *weighted average* of traded amounts, with the weights being the price discrepancies between autarky and trade, does give the aggregate result that imported items have, *on average*, a lower price in trade than in autarky.

Are gains from trade only possible if resources can be reallocated according to comparative advantage? No. The setting is displayed in Figure 1. To be more general than is found in the Ricardian model, suppose the country's transformation schedule is bowed out if resources were free to move from one sector to another, and that autarky equilibrium is found where an indifference curve is tangent to the transformation schedule, at point **A**, with the relative price

¹ Think of moving from autarky to free trade in two steps: While still in autarky change the *ownership* of every individual from the autarky allocation of ownership to the post-exchanges. Such a change does not alter any individual's real income (i.e. the post autarky trade income compared with having that consumption represent the new endowment). This assumes that all expectations of the future prices are neutral. In the next step open each country to international trade, and *everyone* gains from such trade assuming world prices are different from initial autarky prices.

of cloth (in units of wine) shown by the slope of autarky budget line **1**. If in the free trade situation resources could move assuming the world price of clothing (in wine units) is shown by budget line **2**, the gains from trade are illustrated by the better consumption point, **C**. The resource movement would be shown by the move from point **A** to point **B**, with inputs moving towards producing cloth, the commodity in which the country has a comparative advantage. However, suppose no resource movement is possible, so that production remains at point **A**. That is, let the production-possibilities schedule be shown by **FAG**. Does comparative advantage ranking no longer matter? No – it does, except not by the shift of resources, but by the change in consumption shown by point **D**. Trade still leads to gains, although not as much as it would if resources could move production to point **B**. What makes trade lead to gains possible even with resources forcing production to stay at **A** is that **HA** quantity of cloth is being exported, and that this *direction* of trade corresponds to the fact that the country has a comparative advantage in cloth (at world prices shown by line **1'**), which is the commodity that is being exported. The gain from trade comes not because more cloth is *produced*. Instead, it comes from less cloth being locally *consumed*, which allows exports that correspond to comparative advantage.²

The result on the effects of trade on real incomes in the move from autarky discussed above has made a strong assumption: The move to trade is unhindered by any tariffs or taxes or subsidies. Is a state of trade that is distorted by taxes or by trade subsidies nonetheless superior for the country than remaining in autarky? As has been shown by Paul Samuelson (1962), Murray Kemp (1962) and others, tariffs are taxes on trade that have the effect of reducing the quantities traded, but still result in gains from, admittedly, tariff-distorted trade as compared to autarky. However, suppose the country also imposes subsidies, say to potential exporters (who might otherwise not be able to export). In the previous remarks about the Ricardian setting imagine heavy English subsidies to encourage English *exports* of wine. Such a move might well change the patterns of trade suggested by comparative advantage and bring

² Note the similarity between this result (a country gains by trade even if it does not produce more of the commodity in which it has a comparative advantage), with the statement that in a Heckscher-Ohlin 2x2 setting, if a country experiences a rise in the relative price of its labor-intensive commodity the *real wage* improves (the Stolper/Samuelson (1941) result. This theorem is most often proved by noting that increases in the production of the labor-intensive commodity causes both industries to use more capital-intensive techniques, which raises the marginal product of labor in both sectors. However, suppose that techniques are rigid and no reallocation of resources can take place and the concept of marginal products is no longer possible. If so, the real wage rate still improves. Once again, an important result in trade theory emerges *even if* no resource reallocation takes place. It is appropriate to note that the Stolper/Samuelson result does depend, however, on an important assumption that is always made, but usually not noted, *viz.* that there is *no joint production*. That is, each production process requires two inputs into production and emerges with a single output in each process.

losses (at least to England). For this reason the arguments about the effect on welfare of interferences in trade typically assumed the existence of trade taxes but *not* of trade subsidies.

In an important paper published in the *Keio Economic Studies* in 1972, Michihiro Ohyama provided a simple proof of a criterion whereby a country that moves from autarky to trade in which world markets have been distorted by that country's set of trade taxes *and* subsidies can be shown still to gain by international trade. The criterion? Consider the total revenue collected by the country in the form of tariff and trade taxes *net* of trade subsidies. *If this net amount is positive, the country gains from trade.* The argument is simple and can be illustrated in Figure 2. Let line 1 represent by its slope the prevailing *domestic* price ratio with trade (and the taxes and/or subsidies still in force). The subsequent production at point G is not the only source of income to support consumption – that is shown by line 2 since net tariff revenue is assumed to be positive and passed on to the private sector. This leads to a consumption point at E, which is superior to the original autarky consumption point at A, or, indeed, is superior to any consumption point that would be on the transformation schedule.

This result is not only an important addition to knowledge about distorted trade and gains or losses, as well it also reveals an important feature in economics: If the question asked is *aggregative* (i.e. in this case is the country really better off with distorted trade than it was in autarky ?), a sufficient criterion is also aggregative, regardless of details (e.g. in the case of many commodities) about which sectors are being taxed and which are subsidized. This is a powerful result indeed.

Some years ago I received a phone call from Prof. Alan Deardorff at the University of Michigan asking about my availability for a forthcoming conference to be held at Ann Arbor. He required each author to submit a paper that addressed a question found in a *different* area of research than previously represented by that author's research.³ The proposed conference date was more than one year away (from his phone call), so that it would be difficult to say, "Sorry, but I am booked up for a different event that weekend." So I accepted, but I suspected that other invitees would find some way of "cheating" (to use perhaps too strong a word). I spoke with a former student of mine, (the same) Michihiro Ohyama, about the possibility of researching how the concept of comparative advantage might be used to describe the incentive of firms to adopt possible new technologies. Our final product, "Technology Choice, Overtaking and Comparative Advantage," was published a few years later.⁴

³ How is that for supporting *comparative advantage*?

⁴ The conference volume was published as *New Directions in Trade Theory* by the University of Michigan Press in 1995, and an abridged version of our paper appeared in the *Review of International Economics*, June, 1995, pp. 224-34.

We considered the situation of two firms in a particular industry, with Firm 1 the *Leader* in the sense of “learning-by-doing” for this firm, giving it an advantage in a type of technology, call it the θ -technology, over a newer firm to the industry, the *Laggard*, which has spent less time in this industry. Our focus included the notion that there were many industries in the economy, producing different products, and some new technologies were being developed in these other sectors. Given that technologies are not limited in all respects just to a single industry, an important question is raised: Could there be parts of the new technology (call it the β -type) that would be useful if adapted by the Leader and/or the Laggard, given that they will have to spend the next period learning and adapting the β -technology so that it would be more useful than sticking with the θ -technology. Assume that both firms have the same rate of time preference (interest rate). The answer to the question might be that both firms decide not to switch, or perhaps both decide to switch. There emerges the possibility, however, that one of the firms does switch to the β -technology but the other firm does not. Which firm switches? We argue that it is the Laggard who is apt to switch and the Leader who stays with the θ -technology. Why? *Comparative advantage*, once again. The Leader has an *Absolute advantage* in the θ -technology, which suggests in general that the Laggard has a *Comparative advantage* in the β -technology. Furthermore, we assumed that both firms have perfect foresight, and can see that if the Laggard adopts the new β -technology (while the Leader does not), the Present Laggard becomes the Future Leader. The excuse by the current Leader, that “if I had only known” was not allowed. The moral: The concept of Comparative Advantage is useful even to areas outside International Trade Theory. I do not delve into the details of the argument here, but I should mention that we also considered that the switch in technologies might be done only partly for one period of time to see if it made sense to switch all the way in the future period, after “learning” about the new technology in the first period. If both firms are switching part-way in the first period, it is the Laggard that makes more use of the β -technology in the first period since taking resources away from use in the θ -technology is *comparatively* less costly than for the Leader.

Although this setting is not focused on issues in international trade as to which country has a comparative advantage in which commodity, it does shed light on the *dynamic* issues that involve trading patterns over time. The creation of new technological features is an activity that is spread globally over many industries and many commodities. This implies that not only might active firms in many countries allocate some resources to creating improvements in technology, but also they often keep aware of changes taking place in other countries and other industries. Such activities encourage *changes* in the rankings by comparative advantage of commodities by the array of countries engaged in trade.

The Ricardian model of trade is especially useful in considering these dynamic features involving comparative advantage and trade patterns. The reason is that the model simplifies by assuming labor is the only productive input. This makes the Ricardian model ideal if the question being asked is whether a particular shock to the economy makes the *country* better off or worse off. Everyone is a laborer, and the analysis of what happens to the wage rate yields the same answer as what happens to the country as a whole. It was Samuelson's intent to point out in his (2004) paper that the increases in the extent of globalization being observed at that time do not always lead to every country being made better off.⁵ At the time of Samuelson's paper Roy Ruffin and I were examining similar issues in the following context: Suppose, in a Ricardian setting, that one country (call it Home) has an *absolute advantage* in production of *every* commodity, x_1 through x_n , numbered so that Home's *comparative advantage* (over Foreign) is greatest in the first industry and least in the n^{th} sector. To simplify, suppose tastes are the same in both countries, with Cobb-Douglas unit elasticity for all commodities. Suppose, now, that Foreign becomes better at producing a commodity that is being produced in both countries before and after the technical progress abroad. Then it must be the case that Home suffers a loss in real income. This is Samuelson's case. However, suppose Foreign can obtain (say by stealth) the technology that Home owns for the first commodity, the commodity for which Home has the greatest comparative (and absolute) advantage, and that Foreign does not need to make any payment to Home for this transfer. Home production of the first commodity is wiped out. In such a situation could Home be made better off? The result, which we and others found surprising, is that Home *might* gain. This surprising result we show by both algebraic and geometric means (Ruffin and Jones, 2008). Here I hope words suffice to suggest the possibility of Home gain. Home could only gain if the cost of living at home is reduced. Make the innocent assumption that all goods produced at Home have a nominal price of unity, as does Home's wage rate. Home could be made better off if and only if the consumer price index falls. The price of the first commodity definitely does fall when Foreign captures the World market, but the technology transfer to Foreign will likely increase its wage rate and thus the price for all commodities imported at Home (except for the first). The familiar two-handed response faced in economics once again holds, and depending upon the relative size of the two countries' labor forces the price index at Home may

⁵ The suggestion that greater degrees of globalization might raise every country's real income is, in my view, stems from a false confusion with the basic statement that free trade (compared with autarky) is helpful to real income in all trading nations. This strong result does not generalize in comparing one level of trade to other levels. A country already engaged in trade will, for a different set of commodity prices, be adversely affected to the extent to which some of the goods being imported face increases in price.

fall as well as rise. This is one of many examples in which economic logic may lead to surprising results.⁶

If all commodity markets are competitive in a free-trade equilibrium, prices of commodities produced by a country are equal to average costs, which in turn depend upon factor prices. The Ricardian model is extreme in its assumption that labor is the only factor of production. Consider an economy before it is possible to engage in world trade. In this case everything that is consumed must be locally produced. Suppose, through technical progress and natural growth in the labor force that consumption and production of all commodities increases at roughly the same rate over time. This could roughly be described as *balanced growth* of consumption and production. Suppose there are 85 commodities thus produced and consumed. Now suppose the country can partake in world markets and, with growth, its *consumption* pattern increases roughly in a balanced manner. In the Ricardian setting the *production* changes are severely affected – it might go from producing 85 commodities to producing only one – the commodity in which it has its greatest comparative advantage. In this dynamic setting through time the commodity being produced may well change. The consumption pattern might well be fairly balanced, but with trade allowing such a compression of production so that only the commodity with the greatest comparative advantage is produced, the production pattern, i.e. the overall “winner”, might well change from year to year.⁷ With international trade in competitive markets consider the equations of equilibrium for all commodities produced at world prices – average costs are equal to world prices of commodities produced and greater than world prices for goods not produced because average cost would exceed the world price. A country generally need not produce more commodities than it has factors of production unless the country is large enough that its consumption is too large for the rest of the world to supply. The Ricardian model is extreme in having only a single input, so that only one commodity is, in general, produced, and with time there may well be a *churning* activity as the assignment of greatest comparative advantage gets altered with growth and technical progress.

The Heckscher-Ohlin model with two commodities and two factors of production dominated the production side of trade theory for several decades. In my view although much good use was made with this model, the focus emphasized the question of which commodity was exported and which imported. The importance of comparative advantage as a concept determining the *pattern of trade* was well emphasized. However, in my view there was in this

⁶ In Ruffin and Jones (2008) the graphical analysis may prove the easiest route to understanding (a view not shared by my co-author).

⁷ In the United States think of how the members of the Fortune 500 best firms change from year to year.

development of Heckscher-Ohlin a departure from the very important use of comparative advantage in asking about the nature of trade in *limiting* the number of commodities that can survive world competition and thus be produced. Consider the textbooks and journal articles that illustrated consumption and production in the two dimensions provided by pages and blackboard surfaces. For example, consider the 2x2 transformation curve used to illustrate consumption and production once trade is opened. Rarely would one see the production point along one axis or the other. Why waste the opportunity to show production of both commodities with trade instead of going to an axis in which there is complete specialization to one commodity produced?⁸

Actually there are easy ways of illustrating the consequences of there being many commodities consumed and produced (at least in the aggregate of countries in world trade). For example, by putting a country's capital/labor ratio on the horizontal axis and wage/rental ratio on the vertical axis, one might illustrate *techniques* used, say, to produce four different commodities by four positively sloped curves, assumed for simplicity not to intersect, thus avoiding the "factor-intensity reversal" phenomenon. Depending upon the country's endowment (K/L) ratio, the country might be completely specialized to one commodity or might produce two commodities, as in Heckscher-Ohlin. Such a diagram is useful in showing how growth for an open economy could (without discontinuities) involve changes in the patterns of production. If commodity prices are given, increases in the endowment capital/ratio endowment when two goods are being produced are shown by a horizontal line, i.e. the wage/rental ratio is completely determined. By contrast, in the case of complete specialization to a single commodity produced, increases in the capital/labor ratio endowment would (of course) serve to raise the resulting wage/rent ratio. With such a diagram one can show how growth over time affects factor prices and the pattern of production.⁹ In my own view diagrams such as this (showing how different production models can be melded) are very useful in showing how development and growth may alter factor returns and patterns of production for an open economy.

The Ricardian model is extreme in suggesting that the concept of comparative advantage suggests that once a country engages in free trade with other countries it need generally produce only the commodity in which it has the greatest comparative advantage. As my remarks on the Heckscher-Ohlin model suggest, in general the extent of concentration of production with trade need not be as severe; the models only suggest that a country need not

⁸ I must admit to avoiding, in my own work, positions of complete specialization in production in the Heckscher-Ohlin 2x2 model.

⁹ I must admit that in proceeding in this fashion in my 1974 article, "The Small Country in a Many Commodity World," I may have erred in submitting it to the (un-widely read) journal, *Australian Economic Papers*.

produce more commodities than it has factors of production. The reason: Given a set of world commodity prices, if a country engaged in free trade produces as many commodities as it has factors of production, all factor prices are *completely determined* with the set of as many price equal to cost equilibrium conditions as there are factors.¹⁰ Given the large number of commodities that can be produced in world markets, it is easy to argue that countries typically produce only a subset of these commodities, as they can rely on other countries to support with imports a larger set of commodities consumed than commodities produced. This important point emphasized in Ricardo is a general phenomenon, one that in my view has been insufficiently emphasized in other competitive models of trade. In particular, it suggests that for dynamic analysis for open economies, a view that economic development can proceed in a fashion that can be described as *balanced growth* is not appropriate. Balance in consumption is one thing – with allowance for changes that are prompted by improvement in qualities and availability of new commodities in world markets. However, if a country can with trade consume a larger number of commodities than it has to produce, the bundle of commodities that satisfy the requirements of comparative advantage can easily be expected to change its composition over time. In production some commodities may be growing at 15 % a year while other commodities may be shrinking even more rapidly. Balanced growth is generally not to be found in developing open economies.

In a recent note (Jones, 2014) I have argued that growth rates will generally not be as large as has been seen in some past years, and this for two reasons: (i) The nature of international trade is changing, especially with the reduction in the costs of arranging production individually of a greater number of parts and components, i.e. a general fragmentation of production processes that allow a much greater number of “items” entering international trade. The concept of *comparative advantage* becomes even more important in suggesting more gains from international trade. (ii) However there has been a general increase in many countries of national governments becoming especially concerned with intra-national income distributions. It is natural, perhaps, for such governments to be even more concerned with the consequences for changes in *local* incomes that reflect a greater degree of international competition rather than that coming from other firms within the country. *Protection* in various forms can seem attractive, especially if Foreign’s wage rate is lower. This is the time-honored distinction between *us* and *them*! I am often tempted to describe this conflict as “Comparative Advantage meets the Level Playing Field”.

Let me finish by emphasizing the role of comparative advantage. The concept seems appropriate in supporting the view that in *static* equilibria competition assures strong efficiency

¹⁰ This reasoning is what underlies Samuelson’s (1948 and 1949) articles on factor-price equalization for countries sharing the same technologies in the 2-factor, 2-commodity case.

outcomes. However, as remarked above, there may easily be much *churning* of production in each country that is a natural outcome of the *dynamic* setting in a more Globalized set of world markets. Technical progress is taking place in many activities, and in many industries. Such improvements are not limited merely to the ranking of firms within an industry, a phenomenon that makes use of the concept of comparative advantage. It also suggests that if the driving force in economic development and growth comes at first from particular industries or new industries, the fact that new techniques and processes are not only useful in original industries suggests that many new activities may benefit others but also create much international competition with some losers as well as winners emerging as patterns of comparative advantage change in a dynamic setting. There may well be a danger that in such a setting countries may be more tempted to contain the damage that such changes impart to industries and techniques whose success was a passing event in the patterns of comparative advantage.

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Ricardo's Case:

	Portugal	England
Wine	80	120
Cloth	90	100

A Switch in Cloth:

	Portugal	England
Wine	80	120
Cloth	100	90

Absolute Advantage in One or Both Countries

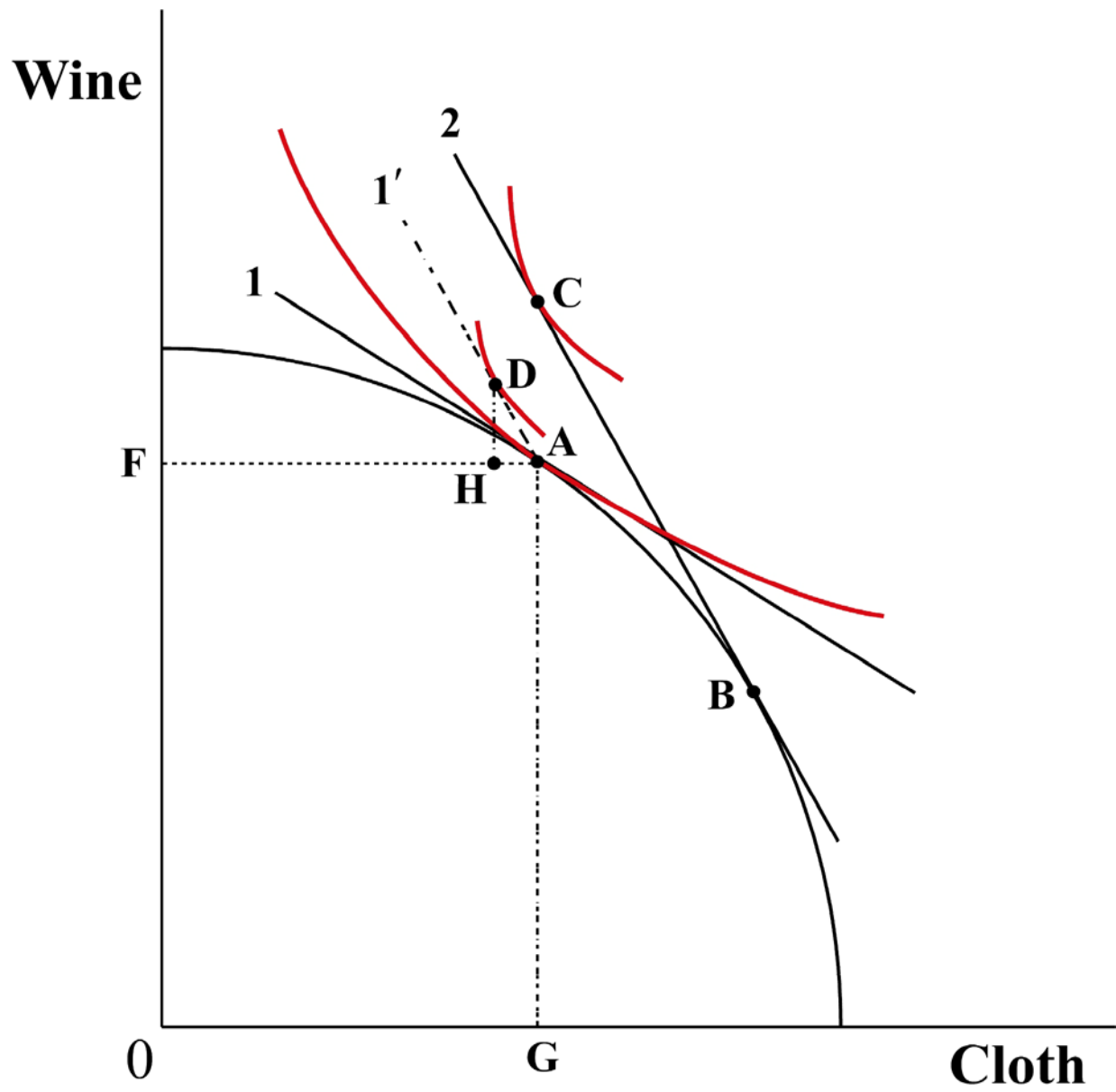


Figure 1 : The Gains from Trade

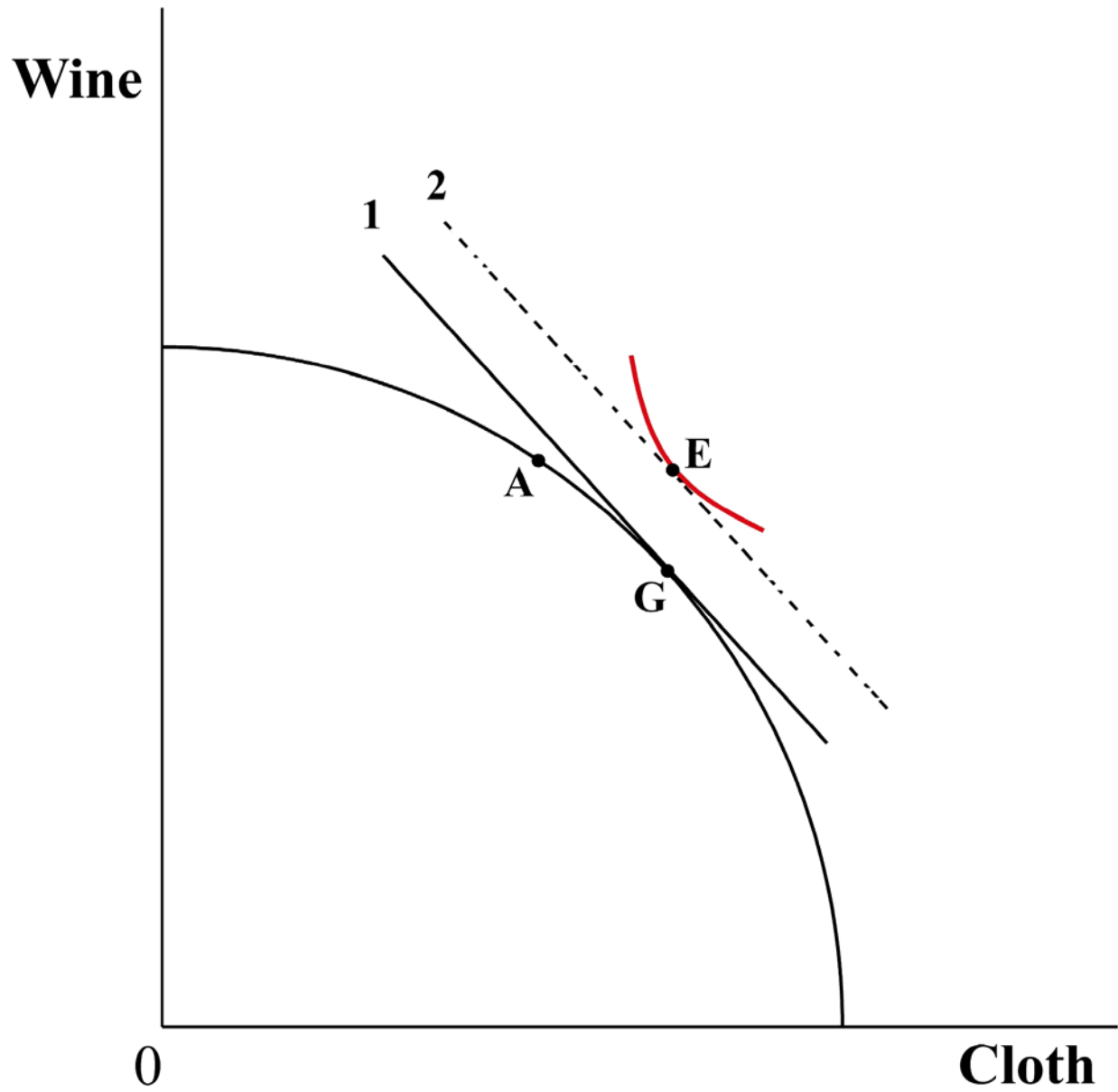


Figure 2 : Trade with Tariffs and Subsidies