On the Validity of Comparative Advantage – Part 1

I.   Introduction

Is comparative advantage an economic law? Proponents of offshoring will surely say yes. They may "prove" the benefit of comparative advantage with aggregate supply graphs demonstrating that price comes down and production increases when you offshore production by reducing the cost of production. However, comparative advantage is not without its detractors. Some argue that overreliance on comparative advantage hurts the well-being of domestic workers (Macy, 2015; Bivens, 2005). While, comparative advantage often does reduce costs (Macy, 2015; Farrell, 2005), it does not lead to job security for the domestic workers as retraining programs are not universally effective (Bivens 2005). Before exploring who is right, we must first discuss what comparative advantage is. David Ricardo is credited with developing the theory of comparative advantage in his book, "*On the principles of Political Economy and Taxation*". Comparative advantage argues that a country should produce what it is efficient at producing where "efficient" is determined based on opportunity costs.

In Ricardo's book, he presents a hypothetical economy consisting of Britain and Portugal. In this economy, there are two products: wine and cloth. It takes Britain 100 hours to produce a given quantity of cloth and 120 hours to produce a given quantity of wine. For Portugal it only takes 80 hours for the same quantity of wine and 90 hours for the cloth. Based on this, Britain should produce cloth and Portugal should produce wine. This is because it would cost Britain more cloth to produce wine when compared to Portugal. For cloth the opposite is true, it costs Britain less wine to produce cloth than it does for Portugal. Using comparative advantage collectively maximizes global production (Ricardo, 1819).

What is particularly remarkable about Ricardo's thinking is he assumes the world is not zero-sum by arguing that countries should use global production as the objective function, or assuming players are trying to maximize global production. He believes the world would collectively be better off if the "economic pie" is bigger and the "fruits" from said pie can be distributed through trade. At the time, this thinking may have been a contrarian view given the world was just beginning to wean off mercantilism (Rush, 2021). However, we must still challenge this view because sometimes situations are in fact zero-sum. For example, let us make a minor adjustment to Ricardo's economy. Let us say it is 1938 and the two countries are Britain and Nazi Germany. Instead of cloth and wine, the two products are weapons and cloth. And let the Nazis have the comparative advantage in weapons. Should Britain stop producing weapons and trust that the Nazis will trade with them weapons for Britain's cloth? Common sense says no. Why would the British trust a rising adversarial power to trade their weapons to Britain in exchange for cloth?

Further, it is likely that Hitler would assume that these weapons would be used against Germany since Britain was not his country's ally. Thus, war appears to act as a zero-sum game in some ways. The Nazi logic may be: why trade when you can lever the weapons to conquer territory to run the war machine? I am not saying we should think like the Nazi's, far from it but rather we should acknowledge that are bad actors. We should acknowledge that there are players in

geopolitics, the economy, your town, etc. that do not have this non-zero-sum view and who may take advantage of trusting players.

This paper will serve as the first in a series of papers where I plan to explore the theory of comparative advantage. I am not against the theory of comparative advantage but rather its application in the real world. An entity producing what they are efficient at producing is generally a good strategy. However, comparative advantage is not without its weaknesses. The one discussed here is assuming that the world is non-zero sum. Further, there are other factors such as lost jobs that are relevant to the comparative advantage discussion. These additional topics will be explored in papers to come.

II.   On the Assumptions Backing Ricardo's Theories

Before laying out my critiques with comparative advantage I think it may be important first to give a little background on the theory of comparative advantage. Specifically, we will start with the assumptions postulated by David Ricardo. Below, I summarize each of Ricardo's[1] assumptions that I view as key to understanding his theory. I will generally withhold my criticisms.

Firstly, he assumes the value of a given commodity is derived by the amount of labor that is required to produce said commodity (Ricardo, 1819). Thus, the key measure here is the amount of time needed to produce a good or service. In practice today, comparative advantage is measured in dollars as opposed to time. Businesses may offshore to countries where the cost of living is low and recognize high profits by drastically cutting labor costs. They can then reduce the prices of their goods to consumers, putting domestic producers out of business.

Secondly, he assumes the price of wages is linked strictly to the price of what he calls "necessaries" (Ricardo, 1819). Necessaries are goods that a person needs to survive. In a similar vein, he also assumes that profits can only increase with a decrease in wages which decrease when the price of necessaries falls (Ricardo, 1819). Necessaries decrease in price due to an increase in productivity. Ricardo believes the cost of commodities is linked to the amount of labor needed to produce said commodity (Whether they be produced domestically or acquired foreign trade). He is fundamentally assuming that profits are linked to wage costs and wage costs are linked to the price of necessaries. The price of goods therefore converges to the cost of wages. He supports this assumption with his belief in the law of one profit, as discussed next.

Thirdly, he assumes a law of one profit where he assumes that it is impossible for two industries to achieve different profit levels over the long term. This is because capital will be invested into the profitable industry and diverted from the less profitable venture until profits are equalized (Ricardo, 1819). Further, he applies this law of one profit to foreign trade as well, eventually after investing in a foreign business with favorable comparative advantage, the profits will equalize over time due to law of diminishing returns (Ricardo, 1819). This relates to the first and second assumptions as Ricardo is assuming that the initial profits recognized by offshoring will

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[1] Throughout his book Ricardo cites Adam Smith and it is clear Ricardo was inspired by Smith's "Wealth of Nations".

go away as capital is invested and divested. Therefore, from the Ricardian point of view, prices of goods and services will converge to the cost of production by his assumption of one profit.

Fourthly, in postulating comparative advantage Ricardo sets the objective function as the global production function. This is a fancy way of saying all actors in the global economy should seek to maximize the global production. Each player should thus produce what they are efficient at producing (based on comparative advantage) (Ricardo, 1819). It is assumed that each and every player should have this orientation and will not pursue their own self-interest as trust in the other players allows everyone to benefit from a larger amount of goods and services produced. The larger pool of production can then be traded among the various players in the economy. Thus, no player will leverage their production against other players to maximize their own relative standing in the global economy.

Lastly, Ricardo is against all government interventions within the economy. Further, Ricardo is strongly against trade restrictions[2] (e.g., tariffs) of any kind as they reduce global production (Ricardo, 1819). For example, a tax will add to the cost of production which in turn will increase prices and reduce the amount of goods sold by supply and demand (Ricardo, 1819). On tariffs, he views these protectionist measures as leading to a misallocation of resources. By protecting domestic industry (and under the assumption that the domestic industry is less cost efficient), more production will be done by the less efficient players in the domestic industry. His antagonism towards protectionism relies on his belief that reducing global production is suboptimal.

III.   Comparative Advantage

Now that we have the assumptions, we can now take a look at the mechanics of Ricardo's comparative advantage. In chapter 7, of Ricardo's book, he lays out his comparative advantage theory. The fundamental argument is that by pursuing the industries where countries have a comparative advantage in, collectively all countries will maximize the total global production (Ricardo, 1819). His objective function is global production, as noted above, which is a key non-zero-sum assumption.

In chapter 7, Ricardo lays out his theory with a numerical example of trade between two countries, Portugal and Britain. As discussed in the introduction, these two countries produce two commodities: wine and cloth. In a given year, Portugal can produce a given quantity of cloth with 90 laborers and a given quantity of wine with 80 labor hours. For Britain, these same quantities can be produced with 100 labor hours and 120 labor hours for cloth and wine, respectively (Ricardo, 1819). Portugal has the absolute advantage in both of these commodities as it requires less labor to produce each when compared to Britain. However, by choosing to produce cloth over wine it costs Portugal 9/8 units of wine per unit of cloth produced. For Britain, the cost per unit of cloth produced is 5/6 units of wine. Thus, it would be advantageous for Britain to produce cloth and Portugal to produce wine as this will maximize global

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[2] Ricardo is also generally against government interventions of economy of any kind as he contends these interventions reduce production and raise prices for consumers. He argues that tax policies should be designed such that they have limited impact on production.

production and therefore there is a bigger pie from which two countries can allocate resources from. The graphs below highlight the two production lines for these two countries where I assume that the "given quantity" is equal to 1000 units and I also assumed that each country has 100 labor hours each. Both of these assumptions do not matter, as what matters in Ricardo's economic view, is the opportunity cost of choosing to produce cloth over wine or vice versa.
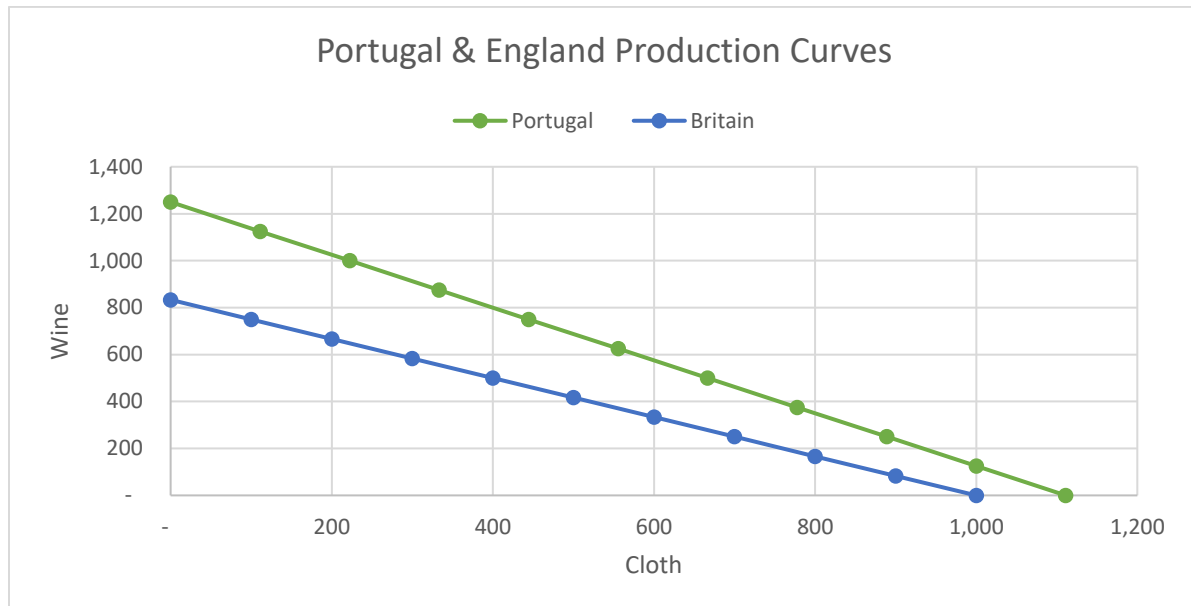
Now based on these curves, the question becomes how do we know that Britain should prioritize cloth and Portugal should prioritize wine? To answer this question, it is best to draw a second curve representing global production as seen below. Let us assume that both Britain and Portugal only choose to produce wine. If so, they can produce ~2,083 units of wine collectively. If this is the starting point, we must determine who should start producing cloth first. Based on the Ricardian view, Britain should produce cloth first as it only costs Britain 5/6 units of wine when producing one unit of cloth. For Portugal, the cost would have been 9/8 units of wine per unit of cloth produced. Therefore, the slope of this line (where slope = equals new units of wine / reduction of cloth) is flattest when Britain produces wine. As seen in the graph below, global production gives up less wine when Britain produces cloth first. Now if the, Portugal had decided to produce cloth first (or any combination of Portugal and Britain simultaneously), this slope would naturally be steeper as more wine would have to been lost for each unit of cloth produced. Thus, the "efficient frontier", as seen by the graph below, is when each country prioritizes production on goods where it has the comparative advantage in. The point the global production settles at will depend on the needs of the economies, but total production will be highest when these two countries prioritize producing commodities that they are efficient at.

Global Production Curves - Optimal vs. Sub-Optimal
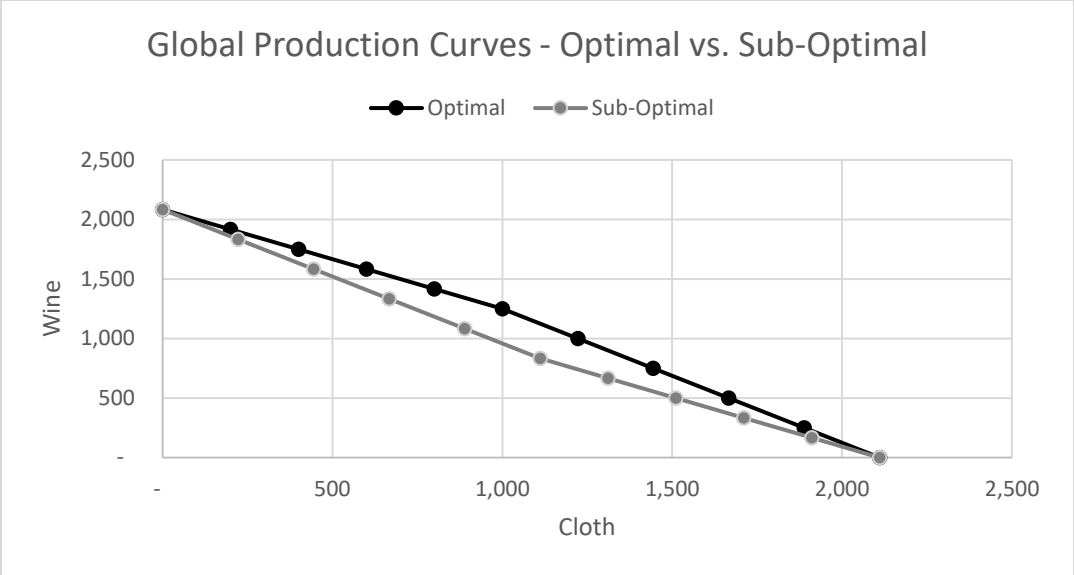
One slight addition to this theory is that a country would not really allocate all its resources to one industry that it has a comparative advantage in. The example above implicitly assumes that each laborer is equally productive to the next. However, it is likely some are more productive at producing cloth and others are more productive at producing wine. For example, using the Britain and Portugal example above, there may be Englishmen who can produce wine at a cost below 8/9 (the comparative advantage of Portugal) and therefore would continue producing wine even though Portugal as a whole has the aggregate comparative advantage. This does not undermine Ricardo's argument but rather, just postulates that the two country-level production curves are non-linear. It is fundamentally a law of diminishing returns concept. You get the most return (in terms of cloth) by making the good cloth workers produce cloth first and then the subsequent workers do not generate as much of a return. To prove this out, I assume that each country's economy is composed of two companies that can devote their workers to either cloth or wine. Key assumptions in Table 1 below.

Table 1: Portugal and Britain – Four Firm Production Assumptions					
Company	Cloth – Labor Hours	Wine- Labor Hours	Cost of Cloth (in wine)	Units- Produced	Total Labor- Available
B1	75	125	0.60	1000	50
B2	150	115.4	1.30	1000	50
P1	120	75	1.60	1000	50
P2	72	85.715	0.84	1000	50

To make the naming clear, B1 is the British Company 1 and P2 is Portuguese Company 2. Note that allocations were set such that global economy is consistent to the previously mentioned example. We will use the slope concept mentioned above, where the efficient cloth producers produce cloth first. If we are at 100% wine allocation, the graphs below represent the production curve for these two countries. In Britain, B1 should prioritize cloth since it costs less wine than it

would for B2 to produce cloth. Unsurprisingly, these curves both look like the optimal global production curves above. Note that these curves are outwards sloping as opposed to inwards sloping. This is natural, since by allocating resources efficiently, a country can extend its production functions outwards.

Portugal & England Production Curves
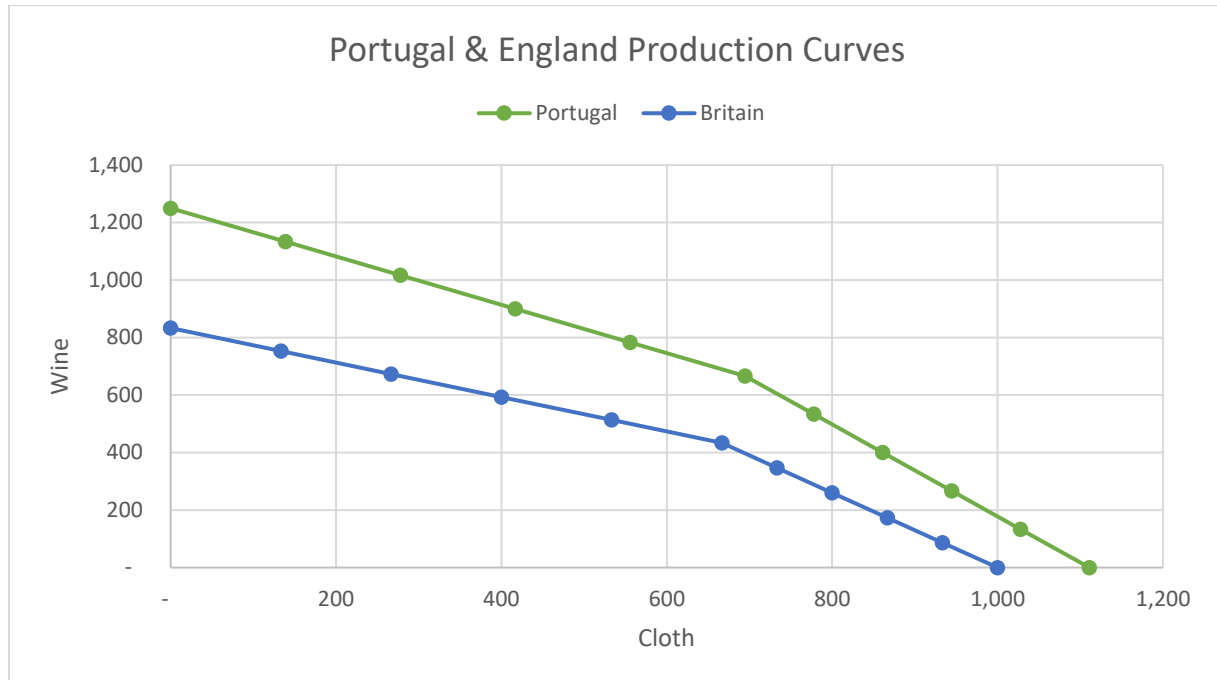
Now as for the global production curve, we will again follow the logic above and imagine that we are at 100% wine allocation. Based on the cost assumptions above, B1 should produce cloth first, then P2, then B2 and then P1 as this is descending order of steepness (or cost of cloth in terms of wine). We notice that there are now four distinct slopes which each reflect the four companies' different relative productivities that define this hypothetical global economy. It may be difficult to see with the naked eye, but it is there, see the assumption table.

Global Production - Multiple Firms
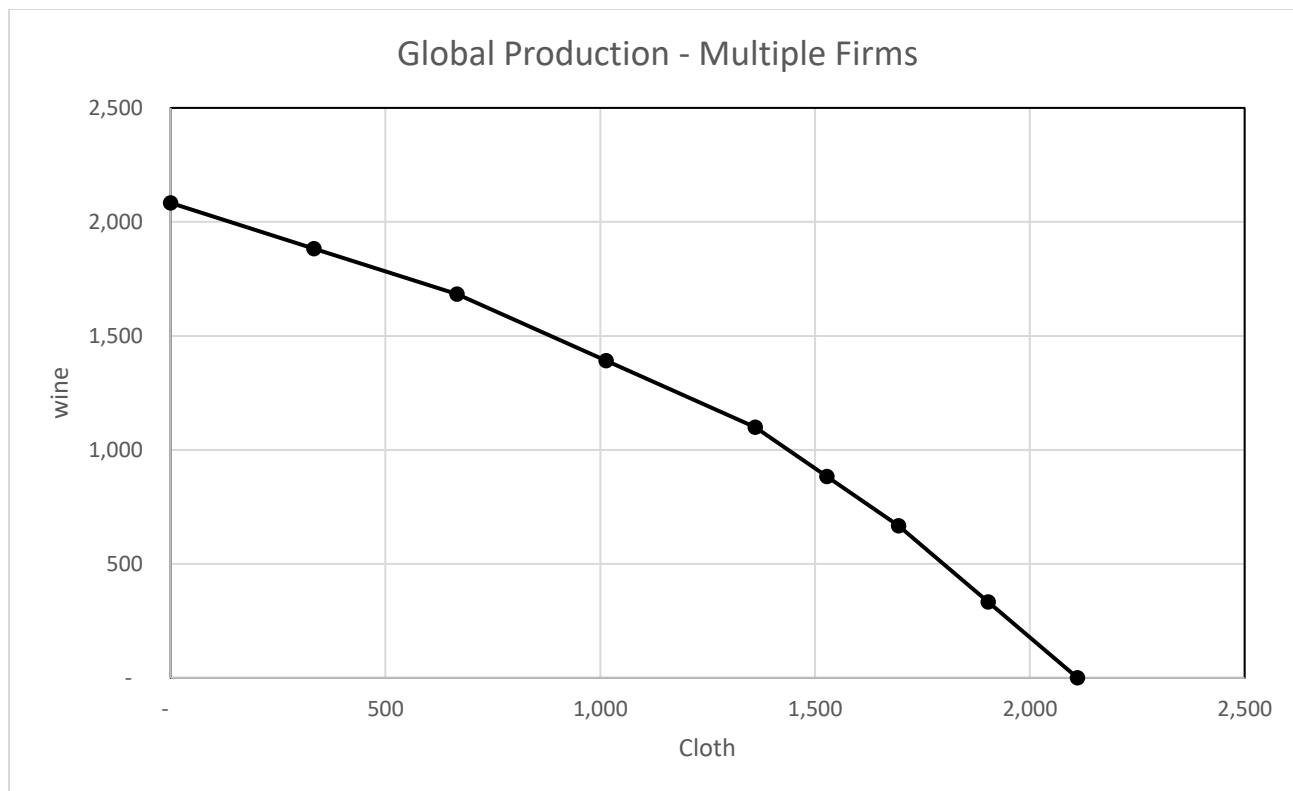
For this example, I have assumed that each worker under each company is equally productive. Again, this is a faulty assumption as some workers may be better cloth makers and some may be better wine makers. Therefore, with enough time, I could expand on this analysis again and develop another set of curves that accounts for the comparative advantage of each worker within an economy. However, that is not necessary, as it is clear that workers should generally produce what they are good at based on the Ricardian view of comparative advantage. Overall, this is all a fancy way of saying that the production curve for two commodities will have a negative second derivative (or have a concave down shape) where with each additional unit of cloth produced more wine must be given up if resources are allocated efficiently.

Now what does this all mean? For starters, by efficiently allocating efforts, countries can maximize global production to extend the global production curve outwards. Further, countries will be able to trade with others for the goods they are lacking in. Since the total production pie is larger, there is more that can be distributed. In practice, this supports the practice of offshoring. The logic here is when companies produce their goods in a foreign country, where labor is cheaper, they are able to profit and bring prices down for consumers. You will notice that in this case, comparative advantage is measured in dollars per time rather than just time which is a slight deviation from Ricardo. However, regardless of this nuance, comparative advantage lowers prices and increases profits. This does appear to be consistent in practice as well but, the increased "growth" is not necessarily realized by the domestic workers who were affected by the offshoring (Bevins, 2005). The question becomes is lowest possible price really the metric we should seek to optimize? Further, is it possible that people can leverage offshoring against the

domestic country? The first question will be explored in a subsequent paper. My answer to the second question is it depends on who your opponent is, which we will now explore.

IV.   Prisoner's Dilemma

In advancing the idea that the world is sometimes zero-sum, it is natural to bring game theory into the mix. Specifically let us look at Prisoner's Dilemma. Let us assume two people are accused of a crime and each are asked either betray their accomplice independently. If they both betray each other they both get a 5-year prison sentence, if they both do not betray their accomplice, they each get a 2-year sentence. If one chooses to betray and the other does not, the person who stays quiet gets a 10-year prison sentence and the one gets no prison sentence. This range of results from this example is illustrated in Table 2.

Table 2: Prisoner's Dilemma		Person X	
		Trust	Betray
Person Y	Trust	2/2	10/0
	Betray	0/10	5/5

Now what should they do? If X knows that Y will trust X, then X is better off betraying Y (2 years vs. 0 years). If X knows that Y will betray X, then X again is better off betraying their accomplice (10 years vs. 5 years). This same logic would apply to Y's thinking. Therefore, in the table, we migrate to a worse off outcome than if they had both chosen to trust one another. Therefore, if they do decide to trust one another they can collectively be better off. I do not dispute this; it would be optimal if these two prisoners migrate to the top left quadrant to get a more tolerable outcome for both parties. However, let us say person X is Adolph Hitler and person Y is Neville Chamberlain. Does that change the calculus for Chamberlain? It most certainly does since person X appears to be someone with a history of not holding true to his promises (as of the end of 1938). Thus, strategy should depend on who you are playing the game with. While it is possible that the world can be non-zero-sum, this assumption cannot be taken as a given.

In addition, there is some empirical evidence for this view. In 1980, there was a Prisoner's Dilemma competition held at the University of Michigan which is known as Axelrod's Tournament (Axelrod & Hamilton, 1981; Roberts, 1999). In this tournament various algorithms were tested against one another (such as tit-for-tat, always cooperate, always defect and other permutations (Roberts, 1999)). The goal here was to accrue as many points as possible based on defined prisoner's dilemma payouts. The design was that each algorithm would play against another algorithm for 200 repeated games and accrue points based on the decisions made. This is a little different than what I have presented in my example, where the goal is to accrue as little prison years as possible. However, if you convert prison years into some sort of "utility points" (less prison years => more "utility points"), you have a parity.

What was interesting about the result was that the winning algorithm was the tit-for-tat strategy (Rapoport, Seale, & Colman, 2015). This algorithm coded in the "Trust but verify" Russian

proverb where one initially trusts their opponent but if their opponent betrays, then the algorithm then betrays going forward (Rapoport, Seale, & Colman, 2015). Using this method, it is impossible to beat one individual algorithm since the maximum points you can achieve is the same as your opponent. Tit-for-tat will never unilaterally betray their opponent. However, unlike the always trust strategy, the tit-for-tat strategy can respond to adversarial players. In that way, the algorithm was able to accrue the most points throughout all games. Now it would be silly to argue one should craft their worldview based purely on an algorithm competition. However, this example does show that one's choice of strategy depends on the structure of the game and the players in the game. For instance, let us say there were only two players in Axelrod's tournament: always defect and tit-for-tat. Tit-for-tat would actually lose because it loses on the first round and cannot recuperate enough points. However, when there are a range of strategies, tit-for-tat gains in relative effectiveness (Rapoport, Seale, & Colman, 2015). The optimal choice of strategy likely depends on the structure of the game and the other players.

In addition, it is also prudent to acknowledge that it is possible to change the decision outcomes in a game which in turn, changes the incentives. Let us go back to prisoner's dilemma and assume that it is the two prisoners who have been caught and are being interrogated by the police. If the criminal organization implements a strict "no-snitching" policy, it is possible to drastically change the decision calculation. For example, if the policy is that if anyone who betrays their partner, will be killed, choosing trust becomes a necessity. Let us assume that being killed is worth 100 years in prison. The matrix becomes the table below. Now, both prisoners should migrate to the top left quadrant as risking ten years of prison is certainly better than being dead.

Table 3: Prisoner's Dilemma - No Snitch Policy		Person X	
		Trust	Betray
Person Y	Trust	2/2	10/100
	Betray	100/10	5/5

## V. Comparative Advantage and World War II

Now let us relate the game theory to comparative advantage. Let us revisit the hypothetical weapons and cloth economy in 1938 between Nazi Germany and Britain. Let us assume that Nazi Germany has the comparative advantage in weapons and the British are more efficient at producing cloth. Ricardian economics says that the Nazis should produce the weapons and the British should produce the cloth. I should note that Ricardo appeared to believe in non-interventionism and called significant military buildup a wasteful government investment (Ricardo, 1819). So, in that regard, his beliefs are consistent. Therefore, he may believe that the Nazis should produce something else rather than weapons. However, this fails in the real world because it does not view the world for what it is. Going back to World War II, one could counter that the Allies should not imposed the Treaty of Versailles on the Germans which may led to their radicalization to the Nazi party. Regardless, in the 1930s, the world was what is was and when

developing strategy, I think it is prudent to base strategy on what the world is, not what it could have been. Hitler was very much in favor of the "betray" option in Prisoner's Dilemma and it is a necessity for the British and the Allies to consider that when dealing with him.

Let us now look at a hypothetical example. I will borrow the Portugal-Britain numbers cited above but will make some key substitutions, namely 1938 Nazi Germany for Portugal and weapons for wine substitutions. The table below summarizes the key assumptions. For simplicity, let us assume that Germany and Britain each have 1 firm that can allocate its resources to producing some proportion of cloth or weapons. This is a slight departure from the diminishing return theory of comparative advantage I explored in section III, but this keeps the example simple.

Table 4: Germany and Britain Production Capabilities					
Company	Cloth Labor Needed	Weapon Labor Needed	Cost of Cloth (in Weapons)	Units-Produced	Total Labor-Available
England	100	120	0.833	1000	100
Germany	90	80	1.125	1000	100

In this example we will notice that Germany has an absolute advantage in both cloth and weapons over Britain as illustrated below. Each country must now decide how they will allocate their labor to producing weapons and cloth. Comparative advantage would tell Britain to focus on cloth and Germany to focus on weapons to maximize global production. However, producing weapons has additional value to Germany in that Germany can (and did) use these weapons against other countries. It can then collect the "spoils of war" from the conquered countries. By producing 1000 units of cloth, Britain is not just giving up 833.3 units of weapons but also its national security. Thus, comparative advantage fails us since both actors have a high intrinsic interest in producing weapons. Non-zero sum thinking also fails us since one actor does not have the goal of maximizing global production but rather pursuing their imperial/genocidal/etc. interests.

Portugal & England Production Curves
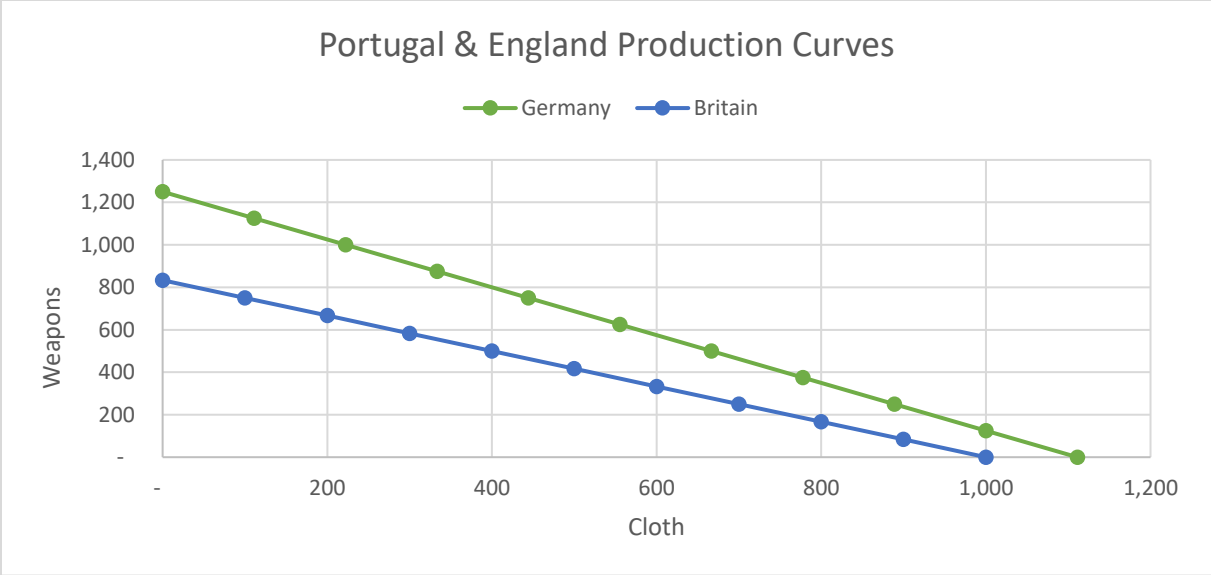
Now, let us bring back the prisoner's dilemma. Let us assume the bare minimum amount of cloth needed to keep both Germany and Britain going is 300 units each. In an alternative world more cloth than 600 units could be produced to raise the well-being of the global community. However, in wartime, austerity is needed, and the bare minimum is assumed to be 300 units of cloth. Each country is given a choice: either trust means and follow comparative advantage by producing what they are good at or betray and produce the bare minimum amount of cloth and devote the rest of their resources towards weapons. Germany will choose the always defect strategy in this thought experiment and Britain is given a choice. Given that by the end of 1938, Germany had already annexed Czechoslovakia, we have some information as to if Hitler is trustworthy. Thus, a tit-for-tat strategy is a rational strategy for Britain. Britain is better off producing weapons "inefficiently" than not producing weapons. These weapons could be used to defend the island and/or counter the Nazi army. The table below summarizes the choice that can be made.

Table 5: Prisoner's Dilemma Production Options		
Key: (Weapons, Cloth)	Trust	Betray
German Production	(1250, 0)	(912.5, 300)
British Production	(0, 1000)	(583.3, 300)

The next table summarizes the prisoner's dilemma outcomes. Given the challenge of equating utility points and the spuriousness of doing so, I have included qualitative outcomes to supplement quantitative results. The top right option, Britain betrays, Germany trusts is not relevant here but was included for completeness.

Table 6: 1938 Prisoner's Dilemma		Britain	
		Trust	Betray
Germany	Trust	(1250, 1000) in global production	Germany has limited access to cloth.
	Betray	Germany has 912.5 weapons, Britain has no weapons	Fight, Britain has a 329 weapons deficit.

Firstly, we will notice the top left option both trust is the best option in terms of global production as it is one of the optimal solutions for maximizing global production. However, the bottom row has the relevant outcomes as this is where Hitler will play. If Britain chooses to trust, they have no weapons and Germany will not trade them any weapons given they were preparing to start World War II. Britain thus has no weapons to supply allies/use to fight against Hitler. Further, Germany places a value on weapons above the cost of not producing cloth since it can use these weapons for leverage. For example, Germany could conquer Britain in this case and take Britain's cloth. The bottom right, both betray leads to both producing the minimum amounts of cloth. This is the most interesting case. Britain still does not produce as much weaponry as the Nazis but, by producing some, it can counter the Nazis. While this option hurts global production, it is still the rational choice for Britain as opposed to being conquered. The take home point is that tit-for-tat is a rational choice given who the opponent was. Assuming a non-zero-sum world only works if your partners choose trust.

Now, let us address some counter arguments. Firstly, some may argue that the British had allies and therefore could rely on comparative advantage when working with them in allocating resources. I agree, that is in line with the point I am making. Thus, if the United States joins this equation, and had the comparative advantage in weapons, Britain could focus on cloth and trade the US for weapons which is an appropriate application of comparative advantage. However, the point is Britain, and the US were allies because they could trust each other, which is not the case for Britain and Nazi Germany. I will add a slight argument for Britain producing some weapons regardless, in this case. The US is likely to pursue its own interests over those of Britain. Therefore, it may be prudent for the British to produce some of their own weapons to serve as a reserve in this hypothetical thought experiment. This prevents them from being wholly reliant on another country.

This view can be backed up if we look to modern times, namely the supply chain crisis during the Covid-19 pandemic. The supply chain became a major problem in the globalized economy where one minor disruption in one region could ripple across every supply chain (Grynspan, 2022). A good example is medical supplies. After the pandemic, the demand for medical equipment increased, and there were shortages in the US. There were shortages because the US was not able to produce enough due to the supply chain issues and the US being reliant on imports from foreign countries (NASEM, 2022). My conclusion here is it may be appropriate to have some domestic manufacturing capability for key goods (such as medical equipment) to serve as a reserve in case of emergencies. I acknowledge there will be a cost to global production

if we do not follow comparative advantage. However, if it allows countries to better respond to emergencies, it is worth the cost. For instance, insurance companies do not set reserves based on what they expect is going to happen. But rather, they add a buffer in case there are short term problems. This way, they will have enough cash on hand to pay to policyholders in adverse scenarios. In addition, if you are against domestic producing you could alternatively buy additional imports to serve as a reserve. However, domestic production may be a safer route in case these goods become out of date and/or the storage costs.

Other detractors could say that my example of war is extreme. World War 2 was a very extreme event, no debate there. However, if comparative advantage is a law as some claim (Samuelson, 2004; Ruffin, 2002), then would it not have to be universal? Following comparative advantage absolutely is a foolish strategy because it breaks down if your opponent uses your trust and levers its economic might against you. I used war as an example, but price dumping is another example prevalent in modern times (Macy, 2015).

It is important that I am not completely biased in favor of the US, even if I do have strong sympathy for former US manufacturing workers. The US is not 100% the victim here. Some countries naturally distrust the US, considering the US' track record on foreign policy. It would make sense for the US to pursue a strategy that 1) does not make other countries distrust us in combination with 2) verify that the US is not getting taken advantage of in our dealing with other countries. Free trade and economic liberalism do not magically make countries less adversarial to us. Further, it would make sense from a sustainability standpoint for the IMF to be less coercive towards developing countries as well (Stiglitz, 2003).

Others may claim that my example simplifies the economy to two goods and two economies. My first counter would be Ricardo, the father of comparative advantage, simplified the economy to two goods and two countries. Further, as Samuelson notes, the Ricardian comparative advantage framework can be easily extended to more than two goods and two countries (Samuelson, 2004). Fundamentally, an economy has a limited number of resources with which it can use to produce a limited number of goods. It can then trade these goods with other countries. How relatively efficient a country is at producing a particular good is important but should not be the only consideration. They should consider the relative value of producing that good, such as risk reduction as explained with supply chains.

Lastly, some may argue that this line of thinking is what leads to the world being zero-sum which I disagree with profusely. Tit-for-tat allows player to both recognize the benefits of non-zero-sum (when playing against fellow non-zero-sum) and avoid complete losses against adversarial players. It is prudent to verify that economic players that we engage with are also following the non-zero-sum framework. Further, it is important to also look internally and assess if our actions abroad are signaling trust to other countries. In addition, it is important to understand who may feel they are on the wrong end of a trust-betray game as that will truly lead to subsequent betray-betray outcomes. Being skeptical is a reasonable mindset and one I would argue is necessary. I endorse the "trust but verify" proverb.

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