

# The Economics of Globalization Backlash

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## Abstract

For a deep understanding of the globalization backlash, we need more help from labor economics than from political economy. We also need to model global dynamic tradeoff between labor productive and allocative efficiencies. The Smithian provides unique insights into the global economic divide (global North and South) that underpins globalization and backlash. Uniform, static and popularity based corner solutions of Pareto efficiency in the ordinary PPF are less useful than dynamic changes of average employment rates before and after globalization, within the North and the South. We draw segmented interior PPF curves to show how a global demand for higher productive efficiency drove up globalization, while conflicts in global labor allocations triggered the backlash, partially driven by a strong social preference of employment over unemployment. Overall, globalization and backlash are dueling outcomes from trading off of labor efficiencies in an economically divided world. While backlash is driven by politically catalyzed social perception, the real value added gains from global production are likely to stay for a longer time.

## 1 Introduction & Overview

How do we explain the trade war and the multifaceted backlash against globalization? Scholars (Pastor and Veronesi 2018; Burgoon 2009; Broz, Frieden, and Weymouth 2019; Rodrik

2018) have focused on political discontents, especially *populism*, in relation to domestic inequality (Helpman, Itskhoki, and Redding 2010; Burgoon 2013; Williamson 2005). Instead of — or better yet, in addition to — political economy, we wonder if the classic trade models of the Ricardian and the Smithian can help us understand not just globalization but also the backlash. The theoretical advantage is obvious if they do: Both globalization and backlash are trade related, so an integrated framework is more natural than shifting back and forth between political economy and trade model. Even more importantly, a labor based model has the potential to cut deeper to explain political economy.

There has been a 21st century “revival” of the Ricardian model (Eaton and Kortum 2012). Long existing — yet largely overlooked — findings have also favored the Smithian model (MacDonald and Markusen 1985; Seretis and Tsaliki 2016; Storper 1992). To our topic here, the classic insights into global production and global labors are still relevant, with a renewed value in the face of backlash, making them the best place to *start* — although not the best place to *stop* — in our inquiry into the backlash.

## 1.1 Revisiting the Trade Models

Following this line of thinking, we will first go back to the *shared* visions in both Smith and Ricardo: (1) putting global production before global exchange and (2) focusing on labors as the only factor of production. The first means understanding global supply chains, a system of globally specialized productions, is the best way to understanding globalization, and provides the best match with what the pioneers had in mind. The second hints at the unique value of labor economics, a field dealing with supply and demand of labor services.

Some things simply do not change much over time: Centuries ago the two pioneers created labor-based trade models. Today, standing on the shoulders of giants, we can develop another labor-based model for globalization backlash. Our job has been made easier by several facts. First of all, while the pioneers lived in an era without global supply chains, we do now and with that, labors can be reallocated without physically moving people across

borders in massive numbers. The only way for Smith and Ricardo to raise labor productivity was through specialization. “Global production” back then essentially meant specialized production at country level. The global supply chains expanded that and among other changes, local industrial clusters within a country now have dominated (Brenner 2004; Humphrey and Schmitz 2002).

What about the differences between the trade models? The Ricardian famously promoted the idea that everyone has comparative advantage, just like every decision faces opportunist cost. The Smithian on the other hand has long been criticized for missing the idea of opportunist costs, making it inferior to the Ricardian. This prevailing view however missed one crucial point: It is easy with the Smithian — but not so easy with the Ricardian — to explain the global economic divide, which shapes both globalization and backlash. Not working with — or more accurately, unaware of — opportunity costs had an unexpected advantage: The Smithian has implicit but strong link with accounting costs.

The notion of “advantage,” in both Smithian and Ricardian, refers to *output* based higher productivity, while the idea of “efficiency” is generally about *input* based lower costs or wastes. But the two are obviously related: Lowering inputs without maintaining outputs makes as little sense as raising outputs without controlling inputs. This is why a common way to illustrate the Smithian and Ricardian is through the fewer labor hours required for producing one unit of good, something related to labor productivity (i.e., output per hour) but with a labor cost focus. The link becomes clear in math:  $LP = \frac{OV}{LI}$ , where  $LP$ ,  $OV$ ,  $LI$  are *labor productivity*, *output volume* and *labor input* (in hours), respectively. Now, if we set  $OV = 1$  for one unit of good produced, then  $LI = \frac{1}{LP}$ , or labor input (in hours) varies inversely of labor productivity.

To simplify the terminology, we can say that the Smithian is embedded with accounting costs just like the Ricardian is embedded with opportunity costs. It is true that accounting costs include explicit costs of *all* business expenses, but given labor as the only factor of production, the two are close to each other. We should also keep in mind that opportunity

cost only considers the lost benefits — but not the potential costs — from the best alternative choice. Accounting costs on the other hand cover both benefits and costs of each choice for each entity/agent.

The largest difference for our discussion here is that unlike opportunist costs, accounting costs are unevenly/ asymmetrically distributed and can do a better job explaining why some countries (e.g., OECD members) possess absolute advantage in most, if not all, industries, while others (e.g., countries in sub-saharan Africa) have historically low productivity across the board. Simply put, the unevenly distributed absolute advantages would accumulate over time to divide the world into the global *North* and global *South*. The Smithian therefore has played a hidden but essential role in globalization: The North-South wage gaps acted as the most important incentive for outsourcing, foreign direct investment and global supply chains, overshadowing the less intuitive and more symmetric idea of opportunity costs, especially among business executives and other practitioners.

By the same token, the Ricardian (based on *symmetric* opportunity costs) applies better to North-North exchanges, while the Smithian (based on *asymmetric* accounting costs) works better for the North → South flows of production that largely defined the latest wave of globalization as we know it. This does not mean that Ricardian is not compatible with North-South trade, but rather that the Smithian works better with a global trade system based on global supply chain, where the North-South wage gaps provided the key driver.

## 1.2 Tradeoff of Labor Efficiencies

The trade models have laid the foundation for a model of backlash that is based on global labors, rather than on domestic populism politics. To go beyond the classics, we move next to the tradeoff of two labor efficiencies: *productive* and *allocative*.

Before going to details of labor efficiencies, we draw attention to two background facts that matter significantly. First, labors are predominantly produced domestically (like they have always been), but can now be allocated globally through liberal capital flows (in the

forms of foreign direct investment or FDI, outsourcing and most of all, the global supply chains). Smith and Ricardo would have been delighted, as global supply chains opened new ways of raising productive efficiency above and beyond country level specialized production.

Another fundamental fact: Employment has been a “social good” for ordinary workers and policy makers alike, while unemployment a “social bad” that nobody desires. Given the heavy dependency of allocative efficiency on social preferences, higher unemployment rate significantly impacted the backlash.

Economics is largely about allocating scarce resources for the largest returns possible. Given such a priority, and if labors are the only factor of production, we would expect much discussion on the tradeoff of labor efficiencies. Unfortunately this has not been the case. Of the small number of studies that did explore the link between labor efficiencies (Decker et al. 2017; Dollar 1990; Yang 2004), the focus was *within* an economy, while progress has to be made from a truly global model.

We cannot blame the pioneers for the lackluster interest. Smith and Ricardo left us a legacy of raising labor productivity advantages, but it is easy to overlook that both absolute and comparative advantages come from improved labor allocative efficiency — by allocating workers to specialized productions. According to Smith and Ricardo, higher allocative efficiency *always* boosts productive efficiency. We now know that this is only one side of the story. What we have learned from the backlash is that labor efficiencies can *help* but can also *hurt* each other, especially at the global level. Improved labor productive efficiency in the South for example came with a price of reduced employment in the North.

Modeling allocative efficiency is more complicated than modeling productive efficiency. For one thing, productive efficiency is a supply side challenge, focusing on minimizing costs by changing the mix of inputs. Allocative efficiency on the other hand is further divided into two types: The *general* type deals with allocating goods in a general equilibrium by better matching the supply and demand of goods. *Labor* allocative efficiency on the other hand deals with inputs for production (i.e., labors in the Smithian and Ricardian), and is related

to technical efficiency to maximize output for a fixed mix of inputs (Badunenko, Fritsch, and Stephan 2008). As such labor allocative efficiency is an issue on the the supply side, typically at the firm level.

Once we move to the global level, however, labor efficiency becomes a challenge in general equilibrium. To see why, keep in mind that in determining production locations, multinational firms prefer factories near the final consumption markets. With the income (and thus the demand) higher in China, for example, it makes sense for US firms to move production sites there. This means for achieving labor allocative efficiency at global level, we must connect global supply chains with global consumption chains from both production and consumption sides.

Another issue is measurement. The general conceptual formula for productive efficiency is  $ATC = MC$  or Average Total Cost=Marginal Cost. For labor productive efficiency, there has been little change since Smith and Ricardo in measuring productive efficiency in trade models: labor hours required for producing one unit of good. We can write the conceptual formula for labor allocative efficiency at aggregate level as  $(DOL = SOL)^L$ , where  $DOL, SOL$  stand for “demand of labor” and “supply of labor”, respectively. Since allocative efficiency is always location sensitive, we add a location parameter  $L$  in superscript, which says optimal allocative efficiency may require labor migration within a country (e.g., Herzog Jr and Schlottmann (1981)) or through global supply chains.

A more accurate formula involves marginal utility of labor ( $MUOL$ ) and marginal cost of labor ( $MCOL$ ):  $(MUOL = MCOL)^L$ , with the same location parameter. These marginals are not the easiest to keep track, although with the two fundamental theorems of welfare economics, we can simplify by equating market prices of labor (i.e., wages) with its marginal costs, which in turn are equal to marginal utility of labor in a mature market without market failures. The same welfare theorems also make point of allocative efficiency equivalent to the competitive market equilibrium (Deng and Leonard 2008) and Pareto efficiency.

Unfortunately, welfair economics theorems no longer hold under conditions like mar-

ket power, externalities, increasing returns to scale, incomplete or asymmetric information. Things get even messier when we move to the global scale, given the non-market economies in the South. Remedies that are feasible within a country, such as governmental intervention, break down at the global level.

A global model however is worthy of the trouble: Without globalization, each economy is at best left with locally optimal labor allocations. With globalization, what is efficient for a single economy may not be at the global scale. With that in mind, we now have  $MGDL = MGSL$ , where  $MGDL, MGSL$  refer to marginal global demand and marginal global supply of labors, respectively, and we no longer need the location parameter in a global model. Note this is the same idea to identify the optimal allocative efficiency from points on the production possibility frontier, which are all equally productive efficient but not equally allocative efficient. Finding the point of allocative efficiency on PPF demands easy quantification of goods produced — or more generally, goals pursued — in addition to easy identification of global marginal utility and global marginal costs using market prices. On a global scale, especially in the South, neither condition is likely to be satisfied.

What about using regular labor statistics? Unfortunately, they are only weakly related to labor allocative efficiency. In economies where the demand is weak, full employment is neither necessary nor possible. The flip side of unemployment rate (or the Non-Accerating Inflation Rate of Unemployment, NAIRU) is no better.

Having said that, bear the fundamental facts in mind that (1) employment is socially and strongly preferred to unemployment and (2) allocative efficiency, unlike productive efficiency, depends on social preferences. Therefore, other things equal, high employment rate is always strongly preferred to high unemployment everywhere in the world, which fundamentally shapes the judgment of allocative efficiency and impacts globalization backlash.

Finally, global economic divide has made tradeoff of productive and allocative efficiencies more prominent. As we show later, the South on average has had a significantly lower unemployment rate than the North — only because the majority of Southern workers are

self-employed in the farming sector that is notoriously low in productive efficiency. Unlike the case in the North, where both labor efficiencies are generally high, Southern workers must pursue a survival motivated subsistent employment first, even if that means to sacrifice productive efficiency. The same global divide can boost labor productive efficiency, but can also make tensions in labor allocation to rise between the North and South. Globalization is primarily driven by a demand for higher productive efficiency (i.e., lower labor cost of production), while the backlash is primarily driven by labor allocative conflicts.

### 1.3 Our Contributions

We model globalization backlash through considering global labor productive and allocative efficiencies *jointly*. Only through the tradeoff prism of labor efficiencies, at a global scale, can we obtain an in-depth understanding of both globalization and its backlash. But modeling labor allocative efficiency *alone* faces difficulties listed above, let alone modeling it jointly with productive efficiency. How can we even start?

Our approach takes three steps. First, we use the global divide to develop a global model in the two country groups of South vs. North; second, we employ a new type of *segmented, interior* global production possibility frontier curves to model the aforementioned labor efficiency tradeoff. Finally and most importantly, we shift from the static, population (or popularity) based Pareto efficiency to Pareto efficiency based on dynamic changes. Operationally, this is accomplished through obtaining two average employment rates — one *before* and one *after* globalization — with the North and South country group.

This is the simplest dynamic model of 2 x 2 table (two country groups by two employment rates), but enough to meet the challenges listed above for a labor-based backlash model. Interestingly, working with changed employment rates turns labor allocative efficiency into a supply side challenge, even at the global level. We no longer need to worry about matching labor supply with labor demand, because employment rate reflects effective labor demand and supply. This is the case even in the South, where the prevailing self-subsistence employ-



ment is also a part of effective labor demand and supply.

Focusing on changes in average (un)employment rates from fixed benchmark has one more advantage: It allows social perceptions to play a role in backlash. Changed social perceptions in turn impacts the popularity of globalization and backlash. Simply put, globalization is easy to sell when it expects to increase global productive efficiency and push up incomes. The same holds when the income or wage gap from global divide is large. Backlash on the other hand is more likely when labor allocative efficiency, or more accurately, when the average employment rate, is reduced significantly from a previous benchmark rate. Either way, dynamic changes tend to have a bigger impact on social perceptions than static conditions, in the sense that  $\Delta(E) = (E_a > E_b) \rightarrow \Delta(P) = (P_a > P_b)$ : Increased employment rate after globalization leads to increased pro-globalization social perception ( $\Delta(P) = f(\Delta(E))$ ) through a (strictly) increasing function of changed employment rate. We can also write a composite function that goes from changed (un)employment rates to pro-globalization social perception and then to the point of allocative efficiency:  $(A \circ P)(\Delta(E)) = A[P(\Delta(E))]$ , or “allocation efficiency of perception of changes of (un)employment rate.”

In contrast, working on a static Pareto efficiency — demanding for a social solution that makes nobody worse off — could be utopian, while asking a solution that makes the average member of a society better off than before is highly feasible. Finally, since average employment rates are aggregated data, they are easy to get — unlike marginal labor costs and marginal labor utilities. When that rate is lower than in the past (that is,  $(U_a - U_b)^S < 0$  and  $(U_a - U_b)^N < 0$ , where  $U_a, U_b$  denote unemployment rates before and after globalization, respectively and  $N, S$  for global North and South), we assume agents are generally better off, in the sense that globalization brings more benefits than otherwise. By the same token,  $(U_a - U_b)^S > 0$  and  $(U_a - U_b)^N > 0$  indicate that the entity had been worse off from before.

This concludes the introduction and overview. We now turn to more detailed discussions below, starting with the trade models.

## 2 Celebrating The Smithian/Ricardian Insights

In many ways Adam Smith and David Ricardo were on the same page and their differences are somewhat exaggerated. In this section we put the two together as if they were one, while the next section will focus on the unique power of the Smithian in explaining global economic divide, another key driver in the model of globalization and backlash.

### 2.1 Global Production Before Trade

Even a casual skimming of Ricardo and Smith will show that their models were first and foremost about global production, as they clearly put the logic of trade *behind* the logic of global production. Of course, they did not have the global supply chains as we do today, so “global production” to them essentially meant “specialized production” across countries.

Here is how the logic worked: Putting global production first is like putting labor productivity first, given labor being their only factor of production. Labor productivity is important because both absolute and comparative advantages were built on its *differences*. Had all entities possessed the same productivity for everything, there would be no comparative nor absolute advantages to talk about. It is the preexisting productivity difference that drives specialized production, which in turn leads to value-added trade. This is why the latest wave of globalization has been the best era of putting Smithian/Ricardian models to work, because for the first time in history we have established a sustainable and efficient global production system known as global supply chains, which now work down to the level of *parts* rather than *finished goods* as suggested by Ricardo.

Reisman (1991) believes Ricardo and Smith ushered the so called “productionist” economic view in the nineteenth century, while the “consumptionist” view in the twentieth century was preshadowed by the Mercantilism and assisted by John Maynard Keynes. True to their names, the productionist sees expanding production the fundamental way for creating wealth, while the consumptionist takes production for granted and focuses on increasing

consumption.

Decades into the 21st century, every economics student today knows market equilibrium hinges on both supply and demand. This seems to imply that both the productionist and consumptionist views are wrong and debating which is more important is meaningless. Yet the two fundamental views still matter: The productionist is highly relevant to globalization, while the consumptionist plays a key role in its backlash. It is thus important to keep in mind that putting global production before trade is a valuable insight, both in the past when the Mercantilism prevailed and today. Had Smith and Ricardo followed the Mercantilism, they would have been long forgotten by now. Instead, their central idea was to point out the best way of creating wealth is not through “trade tricks” that relied on colonies, tariff and subsidies — anything increasing current account surplus and/or decreasing deficits — but through honest and efficient production of specialized goods and then trade. Calling them “trade models” is thus an understatement, considering that trade could just mean pure exchanges without invoking things like the production function, the marginal product and the allocative efficiency of inputs for maximizing outputs.

The classic models have renewed utilities when there are trade conflicts. To be sure, the value of global production is widely recognized nowadays, thanks to the success of global supply chains, so the rhetoric today is not exactly the same as the historical Mercantilists. Nonetheless, the Mercantilist ghost still lingers, and shows up whenever anyone (a politician, a commentator, an unemployed worker) has attributed economic success or failure of a country (e.g., China) to winning or losing the trade war or playing the trade tricks, as the Trump administration has been doing.

## **2.2 Focusing on Global Labors**

The two trade models also treat labor as the only factor of production, leading to a univariate production function. This is not as bad as it sounds — as long as we keep labor productivity in mind. For one thing, higher labor productivity, shown as fewer unit labor

hours as Smith and Ricardo did, frequently calls for more capital investment into improved technologies, unlike the old days when higher labor productivity could have derived from natural endowments. Thus coconut farmers in Thailand would harvest more coconuts each hour because there were far more coconut trees there than in the US.

Focusing on global labors fundamentally means a shift of attention from *commodity* market to *factor* market — more specifically from local *goods* market to global *labor* market. In light of this shift, globalization is all about reallocation of production (and therefore of labor as the only factor of production), accomplished through outsourcing, foreign direct investment (FDI), global supply chains and fragmentation of production. The idea behind these global production innovations is surprisingly simple: to leverage the freer flow of capital without shifting too many workers across borders. Of course liberal flow capital is not to be taken for granted, and we are likely to see it being reduced or interrupted with the ongoing trade war and moves towards “decoupling.” Nonetheless, the two conditions of freer capital flow and lack of free flow of global labors have provided the backdrop for globalization as well as the backlash.

### 3 The Smithian Insight on Global Economic Divide

The world has been divided into the Global North and Global South even before globalization. Historically the North included the so called “First World” plus the “Second world” in the former Soviet bloc during the Cold War, while the South was called the “Third World.” That has been changed by the collapse of the Soviet Union, after that the former “Second World” became the recipient of capital investments (both financial and intellectual capitals) from the First World, putting them in the South now.

The North-South divide has been challenged (Therien 1999), but many authors later have shown the perseverance of the economic divide (Mimiko 2012; Arrighi, Silver, and Brewer 2003). Let  $\alpha, \beta$  denote the global North and global South country groups, respectively, with

exclusive membership such that any country  $c$  at any particular time  $t$  can only belong to one but not another group, because  $\{(c \in \alpha) \cap (c \in \beta)\}^t = \emptyset, \forall t \neq 0$ . We will show how the Smithian but not Ricardian can help explain the membership in  $\alpha, \beta$  below.

### 3.1 The Watershed Between the Smithian & Ricardian

Much has been said about the Smithian model missing the idea of opportunity cost and deserving to be superseded by the Ricardian. The backlash however taught us something new: the unique value of the Smithian in explaining the global economic divide — even though Smith never explicitly talked about it during his lifetime — for which the Ricardian has little to offer. The latter only emphasizes relative advantage of individual entity based on opportunity cost. It is not that comparative advantages do not exist for country groups, but rather that they exist in relative term down to individual countries within each country group. Divide or not divide, country grouping or not grouping, each entity always possesses comparative advantage of its own. Similarly, it is not that the Ricardian does not care about labor productivity — comparative advantage exists only when labor productivity *differs* among entities. What matters for the model however is *relative* productivity difference for different goods or different entities, under autarky or free trade. Thus the North does not always have advantages, just like the South does not always have disadvantages. In other words, the *marginal* probability  $Pr(c : c \text{ has comparative advantage})$  is the same as the *conditional* probability  $Pr(c : c \text{ has comparative advantage, given } c \in \alpha \cup \beta)$ , where  $\alpha, \beta$  denote country groups. The reason is simple: The North/South grouping is an ex post facto result, not an ex ante driver of national income.

Now consider absolute advantage. In the eyes of the Smithian model — only implicitly, as Smith's job back then was to promote trade, not global divide — the world can have a stable and long lasting divide, because absolute advantage is a simple function of labor productivity, all it asked was for productivity (i.e., domestic labor productivity under autarky) to differ among countries. As long as gaps of productivity exist, country grouping will exist. Similarly,

when the gaps grow, we expect an enlarging income difference. Therefore, a country's North/South membership is a univariate function of its average productivity  $f : p \rightarrow g$ , with a continuous domain in  $p$  (productivity) and a binary codomain of  $g$  for country groups. It is never an accident in the first place that a particular country entered the North or South country club, and the same labor productivity will make it stay or leave the original country group over time.

### 3.2 Free Trade & Global Divide

What about the impacts of free trade on the North/South divide? One way to find out is to look at changes in country group membership, or more accurately the changed probability for being in the North or South. Let  $Pr_c^b$  be the probability a country  $c$  in the North or South ( $c \in \{\alpha \cup \beta\}$ ) *before* it participated free trade, and  $Pr_c^a$  the same probability *after* that, the question then becomes whether at least one country will have a changed probability of country group membership due to globalization  $\exists c, Pr_c^b \neq Pr_c^a$ ? Note we ask for *change in probability* rather than changed membership. The former leads to the latter only when the probability is changed sufficiently large.

This turns out to be an easy question for the Ricardian. To see why, bear in mind that the model predicts that all trading countries receive a strong Pareto improvement over autarky (i.e., all trading countries are *strictly* Pareto better off than no trade). Therefore the prior (i.e., before trade) probability of group membership (in North or South) *will* differ from the posterior (i.e., after trade) probability, which may lead to a visible membership change when the size of probability difference is large enough. It is entirely possible, with probability strictly larger than 0, for a Southern country to upgrade itself into the North under the Ricardian if the country leveraged its comparative advantages well. Under *no* circumstances with the Ricardian would free trade strengthen or consolidate the pre-existing group membership, such that the probability of at least one country shifting group ( $\exists c, Pr_c^b \neq Pr_c^a$ ) is *reduced* and the opposite probability  $\exists c, Pr_c^b = Pr_c^a$  *increased*, since that would deny

the Pareto optimality under Ricardian.

Now consider trade and global divide under absolute advantage. While comparative advantage always leads to mutual gains, trade based on absolute advantage can produce *asymmetric* gains such that it is possible for an entity to have absolute advantage in producing everything, while another entity nothing. Also, “differences in productivity may give rise to transfers of value towards the units of capital with an absolute advantage in production.” (Seretis and Tsaliki 2016, 438) This has been proven by the global supply chains, where the Northern multinational enterprises (MNEs) have received the lion’s share of gains from globalization (Hufbauer, Lu, and others 2017). As time goes on and with fragmentation of production, developing countries can expect even lower returns from participating the global supply chains — unless they manage to climb up the technology or value added ladder, like China has been anxiously doing. Seretis and Tsaliki (2016, 439) was right that “any individual country that holds advantages in production costs at the beginning of the trade transactions will seek to maintain them in the same way as an individual capital struggles to prevail over its competitors in the domestic market.” As a result, technological or “absolute” advantage explains why “the global economy may be thought of as consisting, in important part, of a series of ‘technology districts.’” (Storper 1992, 60)

### **3.3 Global Divide as Globalization Tailwind**

Not only can the Smithian explain the origin of the global divide but also its link with globalization. An economically divided world not only makes perfect sense — as a function of differences in productivity — but also a good catalyst for globalization, for the simple reason that a deeply divided world has a large North-South wage gap that is attractive for Northern agents to enter the South to grow business at significantly lower costs.

Let  $C$  be the average total cost of shifting production overseas, and  $G$  the average wage gap between the North and South. Globalization — in the sense of reallocating global labors — is only possible when  $G > C$ . Otherwise firms would either be indifferent to reallocation

(when  $G = C$ ) or not join the global supply chains at all (when  $G < C$ ). In fact, the bigger the gap in productivity — and thus in wages — the lower the opportunity (and accounting) costs for Northern firms to move production to the South, just as Southern workers will find Northern firms' local wage offers competitive.

A large productivity gap also allowed Northern firms to protect their “frontier” or core technologies to reduce the cost and risk entering the South: They did not have to sacrifice the latter in order to enter the South, as the non-core or mature technologies were still attractive to local firms — at least for a while at initial market entry. China's “trading market for technologies” strategy — where China opens its huge domestic market in exchange for Northern firms to reveal their core advanced technologies (Mu and Lee 2005) — had largely failed, as Northern firms were only willing to put mature and non-core technologies on the bargaining table.

To fully appreciate how global economic divide benefited globalization, look back at the time when the “import substitution industrialization” (ISI) or the “Latin American Structuralism” strategy was popular (Alexander 1967). As Sapelli (2003) pointed out, ISI rests on two pillars of a closed economy and a strong role for the state. In hindsight, ISI was rightly abandoned in the 1980s exactly because it failed to take advantage of the global divide. The Mercantilism did promote domestic manufacturing, infant industry protection and subsidiary during the 16th - 18th centuries (Chang 2002), as Williams (1958, 420) pointed out that “the central characteristic of American history from 1763 to 1882 was in fact the development and maturation of an American mercantilism.” But that was a time when the world was less divided. After the North/South divide deepened in the 20th century, the optimal development and industrialization strategy is no longer ISI but FDI and global supply chains, through which Southern countries can leverage mature technologies, capitals and management knowledge — all provided freely, voluntarily and “generously” by the Northern firms — to the best of their interest of growing rapidly and efficiently. Instead of relying on domestic governments, globalization relies heavily on the Northern



firms that could offer capital and technologies, resources that are unavailable from national governments; and of course, instead of a closed economy, globalization switches to open borders and free trades.

### **3.4 Global Divide as the Headwind**

Global divide not only provides incentives and catalyst for globalization, but also blows a headwind against globalization (i.e., a tailwind for the backlash.) This is understandable if we consider the fact that the world is still deeply divided after decades of successful globalization (Mimiko 2012; Arrighi, Silver, and Brewer 2003). While globalization reduced the North-South income gap (e.g., Dollar 1990), it came at a price both within and between countries. In the US, as much as one-quarter of the contemporaneous aggregate decline in manufacturing employment can be accounted for by Chinese import competition, in addition to a sharply rising unemployment payments, disability, retirement, and healthcare costs, for workers in more trade-exposed labor markets (David, Dorn, and Hanson 2013; Autor et al. 2014; Autor, Dorn, and Hanson 2016; Artuğ, Chaudhuri, and McLaren 2010). Levchenko and Zhang (2013) cited similar findings from OECD countries, where workers displaced by import competition experienced longer unemployment spells and larger income losses compared with workers losing jobs for other reasons. IMF also finds the rise of emerging market exports contributed to the fall in the labor share of GDP in the OECD countries.

These studies focused on domestic changes from globalization. We obviously also need a bigger picture between country groups with a globally interconnected view. More detailed data will be presented later.

### **3.5 Who Are The “Backlash Agents?”**

Global divide did not automatically generate a headwind against globalization — human agents are needed to accomplish that. It is the “Global divide + Global supply chains” that effectively turned the South into the global suppliers while the North dominated global

demands. But that is not the whole story. What we have observed so far also tells us that globalization was largely driven by the global supply side of the South, while the backlash was initiated by the global demand side of the North. This pattern is expected to continue in the near future.

Knowing the above facts helps us understand why a backlash of this current size and depth is even possible. A big lesson here is *not* to blame *all* trade conflicts, because not all conflicts lead to backlash. The South-South trade conflicts exist just as real as the North-South type, especially between China and other emerging economies (Hanson and Robertson 2008). In fact, Southern partners are more vulnerable to conflicts as they are less capable of adapting to competitive shocks (Álvarez and Claro 2009). However, South-South conflicts are unlikely to grow into a global backlash, for the simple reason that they all sit on the global supply side and stand to gain more from globalization than from pulling away from it. Forces on the global demand side then are the only party willing and capable of triggering a backlash. They can pull the supply chains back home, or more realistically shift to other Southern countries.

### **3.6 Who Won: the Ricardian or the Smithian?**

Now is the good time to summarize the theoretical discussions of the two trade models. The first qualified answer to the above question is “It depends.” Overall, the Ricardian model has attracted the academics because the conclusion that anyone has comparative advantage and the opportunity cost that the model is based on are counter-intuitive, making it an interesting story to tell in the classrooms and also in academic papers. On the other hand, the intuitive and tangible differences in accounting costs of production — caused by absolute difference in productivity — speak the loudest to business owners and executives. What we have ended up with is a divided reality: That the Ricardian model received nearly exclusive academic attention, while the Smithian — with its link to the accounting costs — has been heeded more closely by the practitioners in globalization.

Our second qualified (and objective) answer is “They both won!” Each has strengths and weakness, applicable to a particular situation better or worse than the other. Overall, the Smithian is good because absolute advantages are stable, consistent, intuitive and easily quantifiable. The Ricardian is also good because comparative advantages are flexible, relative, inspirational and counter-intuitive. These properties are all desirable at different times and occasions, much like computer software and hardware coexisting in the world. Put differently, the two models are more complementary than mutually exclusive. The question is which works better for what.

Table 1 deviates from the currently prevailing thinking: It is the Smithian more than Ricardian that explains globalization with its unique insight on global economic divide. With a link to the intuitive accounting costs, the Smithian appeals to business entities and entrepreneurs more than the less intuitive concept of opportunity costs, which has inspired the intellectuals. Global divide has also driven the backlash, so the Smithian is relevant to backlash as well. The Ricardian however can play a crucial role here for the simple reason that it is *relative* income change — more than absolute income gaps — that matters for social perceptions. Perceptions can be dissonant from facts, sometimes significantly. When China managed to grow its economy quickly, it is easy to think of words like “rip-off” or “being taken advantage of” when many workers lost their jobs at home — despite that the per capita income of China is far lower than that of the USA. Again, absolute incomes matter less than relative income change.

After introducing the global divide, we are now ready to move on to the core topic of the tradeoff between productive and allocative labor efficiencies.

## 4 Producing & Allocating Global Labors

Focusing on global labors means to look at how labors are produced and allocated across the world. Consider production of labor first. The Ricardian model tells us that goods are

Table 1: Summarizing the Smithian vs. the Ricardian

Factors /Dimensions	The Smithian	The Ricardian
<b>Foundations</b>	Accounting cost reflecting accumulated productivity	Opportunity cost reflecting relative productivity
<b>Consistency</b>	Possibly similar gap in absolute advantage under free trade or autarky	Different comparative advantage under autarky or free trade
<b>Potential of packaging</b>	Easy to accumulate elementary absolute advantages into a package for the same entity	Not easy to accumulate elementary comparative advantages into packages
<b>Bases of comparison</b>	Full, including cost and benefits of all options/entities	Partial, only considering lost benefits of the best alternative
<b>Audiences</b>	Popular among practitioners	Popular among academics
<b>Best in explaining</b>	Global economic divide; globalization	Backlash

better produced in concentrated places, taking advantage of the Marshallian externalities and comparative advantage from specialization. It implicitly assumes that local agents possess unique comparative advantages for producing something better, faster and/or cheaper, and business will find a way to move there to let local agents do the jobs they are best at.

These two things: knowing who is the best for producing what and moving production to the optimal sites, are not necessarily true when it comes to production of labors. For one thing, labors are produced *everywhere* in the world — embedded with human reproduction but with value-added education and training — not just in a few concentrated places. Even though some countries are better at producing higher quality labors (e.g., from better and longer education and training), we cannot ask other countries to stop producing labors of their own.

In producing physical goods, willing and able-bodied human beings are the resources but the goods produced are non-human, only used by humans. In the production of labors, human beings are the resources and also the “good” produced. Of course, not all humans are equally employable, so the “goods” produced are *employed* or employable workers. Employment or unemployment depends not just on types and levels of personal skills but also on locations, more accurately on the location specific labor demands.

Since production of labors is widely spread rather than concentrated, how to best *allocate* humans to the globally active labor forces is a big challenge for several reasons. First, moving the best matching workers to concentrated production sites is not always feasible, again because labors are still not free to move across borders (and the coronavirus pandemic made it even harder). Secondly and more importantly, allocative efficiency is ultimately a job in general equilibrium, because we need to match supply and demand of labors, just like for allocative efficiency of goods. Thirdly, newer technologies tend to reduce labor demand directly or indirectly, especially where wage level is high. This trend goes against the fact that employment is a social good, which means allocating labors has a heavy social/political side. Its successes would bring gains in social welfare but its failure would entail long lasting and wide spread negative social consequences, exactly like we observe today. The discussion below tells us why.

#### **4.1 Unemployment As A Social “Bad”**

In producing physical products, only “goods,” not “bads,” are produced to provide utilities to at least one member of the society. Real markets do not always clear themselves, so we will see wasted goods from time to time. Wasted goods however are still goods and if offered free or at a discount, people will grab them quickly. Similarly in production of labor, some people have low “employability” and would enter the “unemployed” category frequently or even permanently. It is not that unemployed workers are “bads” but the status of unemployment is, at least for working age individuals. In other words, work has a hidden social welfare function (Thomson 2015). This globally shared distaste for unemployment explains why ideas like “job guarantee” (Mitchell and Muysken 2010) or “employers of last resort” (Sawyer 2003) have been proposed that uses the public sector as a buffer zone to absorb unemployed workers from the private sector.

As a social “bad”, unemployment can have a positive utility if one is preparing for something bigger and better in the future. But most typically it has a *zero* utility — if the

social safety net is well developed, including future-oriented social investments (Busemeyer and Garritzmann 2017; Ranjan 2016) — or *negative* utility (i.e., disutility) if social safety net is not generous, including weak training for re-employment. Either way, losing jobs is *worse* than wage inequality, because the utility of employment  $U(e)$  is *strictly* higher than that from unemployment  $U(u)$ , for an average agent  $i$ :  $U_i(e) > U_i(u)$  or the entire nation/society:  $U_n(e) > U_n(u)$ .

A more elegant and accurate way is to use the unit (or Heaviside) step function to denote the utilities of workers  $U(w)$ , whether employed ( $w \geq 0$ ) or unemployed ( $w < 0$ ), as

$$U(w) = \begin{cases} 0 & \text{if } w < 0 \\ 1 & \text{if } w \geq 0 \end{cases}$$

Here the unemployed is denoted as strictly negative by  $w < 0$  rather than by  $w = 0$  to allow an open interval  $(-\infty, 0)$ , which is required for “stair-like” step function. The position of the end points can be linearly shifted but the intervals must remain. With a scalar  $c > 0$  and without loss of generality, we could change the above into

$$U_c(w) = \begin{cases} 0 & \text{if } w < c \\ 1 & \text{if } w \geq c \end{cases}$$

There is however at least one advantage of using the more specific  $w < 0$ , not the more general  $w < c$ , to signify the strictly negative domain that the unemployed workers may find themselves in, both in terms of negative physical /mental status and negative social interactions that lead to “angry communities” when entire geographic areas are full of unemployed workers (e.g. the “rust belt” in the US since 1980s, see Ozawa (2018) for a good discussion) due to the same reason of globalization. Among other things, this community-wide unemployment increases information, psychic and other costs of relocation as discussed in Herzog Jr and Schlottmann (1981).

So far we have set the utility of all employed workers to 1 while 0 for all unemployed.

We can do better to quantify different utilities of different employed workers. All we need is to have a wage based multiplier  $m$  to allow the utilities of employed workers to vary by wages: either  $f(w) \propto m * u_c(w)$  or more accurately  $f(w) = m * u_c(w)$ . Of course, doing so would move us away from the unit step function and to the more general class of multiple step functions, although the utility for the unemployed remains zero.

## 4.2 Efficiency Tradeoff of Global Labors

Globalization improves labor efficiencies, this much is known to almost everyone. What is not so well known is that both productive and allocative efficiencies are at stake. When we consider allocative efficiency for the entire world, it will take a front and central position, especially after productive efficiency is globally improved from shifting the focus of globalization from pure exchanges to global production through global supply chains — as the Smithian and Ricardian prescribed.

## 4.3 NAIRU & Productive Efficiency

Given employment is socially desired *everywhere* while labor are produced *locally*, one seemingly easy way to satisfy allocative efficiency of labors is to let all countries have full employment. The idea is simple: Full employment in every country would preemptively eliminate the problem of allocative inefficiency in the world altogether. Instead of full employment, a more realistic goal is a NAIRU (Non-Accelerating Inflation Rate of Unemployment) rate, a benchmark concerning spare capacity in the labor market that affects wage growth and inflationary pressure. The usefulness of NAIRU is generally accepted (Ball and Mankiw 2002), although see Gianella et al. (2008); Gordon (2013); Cusbert and others (2017) for a healthy debate.

NAIRU is not designed for measuring labor allocative efficiency. The latter is about how the labor supply matches labor demand, which requires more delicate management than a near full employment everywhere. For example, an economy with little demand for anything

Table 2: Average Unemployment Rates (%) By Country Groups, 1991-2019

<b>Countries</b>	<b>Averages</b>
Least Developed	4.365
Low Incomes	3.910
Lower Middle Incomes	4.402
Low & Middle Incomes	4.893
Middle Incomes	4.988
Upper Middle Incomes	5.731
<b>Global South (Average Above)</b>	<b>4.655</b>
<b>Global North (High Incomes)</b>	<b>6.879</b>

Source: Based on The World Bank Data

is better left with non-full employment. We also do not have accurate measure of NAIRU in developing countries, where the issue of hidden unemployment causes problem (Komijani and Mohebi 2013). This puts the notion of a “Global NAIRU” on a shaky ground. Given these limits, we are modeling how *dynamic* changes in productive and allocative efficiencies impact backlash, not relying on static NAIRU per se.

The good news is that global NAIRU, or sufficiently low unemployment in the North and South, seems not too difficult to reach. Table 2 is based on data from the World Bank (2020). The two rows of “Global North” and “Global South” at the bottom are labeled and calculated from the original data. “Global North” is the same as “High Income” countries from the World Bank, all provided capitals and technologies in global investments, while “Global South” is the average of all the other countries (see the previous discussion on why the Soviet bloc countries, or the “Second World,” are better placed on the ~~received~~ end of capital investments from the North). As we can see, the average employment rates from 1991 to 2019 in both North and South are already close to NAIRU. The average unemployment rate for the North is 6.88%, while 4.66% for the South. Notice low income countries have *lower* unemployment rate than their high income counterpart.

There is just one problem: Global NAIRU, while loosely related to labor allocative efficiency, can be far away from the optimum level of productive efficiency. The problem is from the South, where the high employment rate is not anywhere close to being productive



efficient. This is why: According to the World Bank, almost 70% (68.32% to be accurate) of the labor forces there from 1991 to 2019 worked in agriculture as subsistence workers. In sharp contrast, developed economies only had an average of 4.31% highly productive farming workers for the same period of time. Labor productive efficiency in the farming industry is notoriously low in all developing economies, in sharp contrast to that in the North (but see Kumar (2017) for the dual rural problems of poverty and unemployment in India.) This clearly shows the limits of relying on NAIRU for measuring allocative efficiency — when we bring in the tradeoff with productive efficiency.

But this is where globalization came to the rescue. As stated earlier, given the Smithian/Ricardian exclusive attention to labor, globalization is first and foremost a global solution to the low labor productivity problem in the agricultural sector of developing economies. Wherever we set our eyes on, one country after another, we see the same story that globalization offered the opportunity for the low productive workers to leave subsistent farming for manufacturing. This explains the big jump in global productive efficiency from lower costs of production across countries.

#### 4.4 Challenge with Allocative Labor Efficiency

Productive (or production) efficiency is fundamentally about cost of production. It is easy and optimal to model it with a curve of production possibility frontier (PPF) that captures the opportunist cost of producing one good (or pursuing one goal) in reference to another. Globalization however is driven more by accounting costs than by opportunity costs, for reasons discussed earlier (see Table 1 for a summary). While a standard PPF models two goods/goals that are both measured by outputs, modeling the tradeoff between productive and allocative efficiencies must deal with two efficiencies that are measured differently.

We rely on wages — the most important accounting cost for labor — to measure productive efficiency. Other things (e.g., quality of products, scale of production) equal, higher wage brings down productive efficiency by pushing up the costs of production. On the other

hand, at least in mature markets it also reflects higher productivity (although keeping in mind the labor cost disease <sup>discussed in</sup> Baumol (2012) for the potential mismatch at least in the short run), which results partly from a higher level of specification of production according to the Smithian /Ricarian models. For economies in the South the wage is zero for self-subsistent workers but for others the low wage still reflects low productivity. Either way, wage has an undisputed link with productive efficiency.

Modeling labor allocative efficiency is trickier and is infrequently discussed, partly because previous empirical findings, discussed in Leibenstein (1966), only provided weak support to the magnitude of losses from allocative *inefficiency*. However, early studies focused on issues of monopoly and trade tariffs, not on labor allocation. The latter covers more grounds and to the extent that everything in production has to be done by humans directly or indirectly, we can argue that misallocation of humans will entail many losses. In fact, “~~the~~ allocation of managers,” the central issue behind the notion of “X-efficiency” in Leibenstein (1966), is just a part of labor allocation to be governed by the same model. More recent studies have rightfully shifted to more human related issues like education (Yang 2004) & experiences (Stefanou and Saxena 1988), information and psychic costs (Herzog Jr and Schlottmann 1981), individual “employability” (Firpo, Carvalho, and Pieri 2016).

Leibenstein (1966) was also right to point out that “it is possible that the magnitude of allocative inefficiency would be large if there are large discontinuities in productivity...” (p. 396), which is the case with global economic divide. Allocative efficiency and productive efficiency are clearly related (Decker et al. 2017; Cho 2018). This in turn means comparing countries where both productive and allocative efficiencies differ much (e.g., the North /South country groups) is a good strategy, because we capture the full — rather than limited — spectrum of variation in both dimensions that better reflect reality.

## 5 Working with Modified PPFs

Production Possibility Frontier (PPF) is a fundamental tool for depicting crucial concepts in economics (e.g., economy of scale, opportunity cost, productive efficiency and scarcity). A standard PPF model is a single curve that always touches the  $X$  and  $Y$ , or the horizontal and vertical, axes. It is designed to show the maximum productive efficiency: Any point on the frontier is *efficient*, anything below is *inefficient* and anything above is *impossible*. Allocative efficiency is *however* not explicitly shown. Of all the points on the curve only some (one or several, depending on social preferences) are allocative efficient.

The big question for us in modeling globalization backlash is whether — and how — we can use PPFs to model the trade-off between labor deficiencies. *It is doable but* The answer is “Yes” but only if we make three changes: Instead of a single curve we must use multiple segmented PPF curves; instead of the default “Corner solutions” we must shift to the interior fractional solutions; finally instead of a static PPF we need to move to dynamic PPFs.

### 5.1 From Partial Specialization to Interior Solutions

The idea behind “corner solutions” is to presume mutually exclusive choices of production or goals, such that agents or entities can choose to produce one good (or pursue one goal) but not another. Mutual exclusive choices makes sense because the resources used for producing one good (e.g., oranges) typically cannot be used for another (e.g., apples) at the same time. This is why both the Smithian and Ricardian promoted *full specialization* for an economy to produce one good but not the other.

But full specialization of production is not always feasible, safe or efficient at all levels. It works fine for particular goods like oranges or apples, as an economy can produce just one and trade for the other. As soon as we move up to a category of goods or to an entire industry, at least for large economies full specialization quickly becomes unfeasible. Consider the industries of *healthcare* and *education*, which have been used in textbooks to show the

tradeoff on a PPF, no (large) country would allocate all its resources on healthcare but nothing on education (or vice versa). The same applies to *guns* (i.e., military or national defense) and *butters* (i.e., foods and agriculture) and to all industries of strategic importance. Full specialization is *unsafe* because it can only rely on imports to meet domestic demand for the industry foregone, making itself vulnerable to the manipulation of others.

Full specialization is also *inefficient*, which may be surprising because a certain degree of specialization does increase productive efficiency as Smith and Ricardo argued. Full specialization at industrial or sector level however rules out the complementarity that exists between industries. Again consider healthcare and education: Higher quality of education prepares more qualified caregivers, both in the short and long runs. Similarly good healthcare promotes better education, as healthy citizens are more capable of absorbing knowledge.

This is not all. It is safe to also assume that people have different interests, preferences and talents, and having multiple industries helps raise efficiency of production because people with different interests and talents will select themselves into the industry that fits them the best, far more efficient than allocating everyone to the same single industry.

The good news is that it is easy to accommodate *partial specialization* of production by simply removing the “corner solutions” and detaching the curve from the axes. The result is fractional or *interior* PPFs in the middle or non-corner areas, where tradeoff makes more sense because goals are allowed to compete but also to complement with partial specification.

## 5.2 Complementary & Substitution Effects of Labor Efficiencies

Higher labor allocative efficiency does bring higher productive efficiency, because supply and demand of labor skills are rightly matched. This is how the two labor efficiencies complement each other. Meanwhile, tension of competition remains because new technologies tend to raise productive efficiency but also could cut down the size of workforce. In other words, capital investment partly substitutes labor inputs.

Strictly speaking, demand for fewer workers due to improved technologies does not nec-

essarily means lower labor allocative efficiency, it just means a new equilibrium in labor allocative efficiency is required. The problem is that unemployment is a “social bad” and humans suffer from both financial and mental costs when they lost their jobs. Workers are also not free — or unwilling — to migrate across borders. Unless new jobs are created for absorbing unemployed workers, or training is provided for unemployed workers to shift to new jobs, we will see tensions between allocative and productive efficiencies.

Even without new technologies, large wage gap between North and South — a symbol of global economic divide — would still create pressure for moving jobs to the South. This is a good move for productive efficiency because the formally subsistent farmers in the South would have an opportunity to move to the more productive industrial sectors. As long as global logistics is not much of an issue, the multinational enterprises from the North would gain significantly from shifting jobs to the South due to significantly lower wage cost of production. As a result, the global average productive efficiency is increased.

Labor allocative efficiency is however location sensitive. While the South has increased both productive and allocative labor efficiencies, the North may suffer from lost jobs with a higher average unemployment rate, depending on the stages of globalization to be discussed later and also on whether the governments in the North have done their jobs in creating new jobs and /or retraining workers for new jobs.

### **5.3 The Dynamic & Segmented PPF Curves**

Previous measures of productive efficiency are static, such that you must use two PPF curves to show the impact of new technology that pushes the entire PPF to the right. On the other hand, it is dynamic changes that matter more in a tradeoff. From ordinary workers to politicians, people are good at comparisons with visible benchmarks. They may not care about the Pareto criterion of whether nobody was worse off while others better off. Instead, they care more about whether their welfares have increased or decreased from a reference point. Applying to labor allocative efficiency, we rely on the average employment rates *before*

and *after* globalization to get the job done.

To get a sense of long term US manufacturing sector employment changes over time with and without globalization, Figure 1 shows that the manufacturing workers grew from fewer than ten millions (9,077,000) in 1939 to its peak of almost 20 millions (19,533,000) in 1979. After that, we see steady decline all the way to the new low of 11,453,000 in February 2010 and then back up slightly to latest of 12,205,000 in September 2020.

The exact timing of globalization can differ for different economies, depending on when they opened to free trade. That said, it is also true that large scale globalization change came after China joined the WTO.

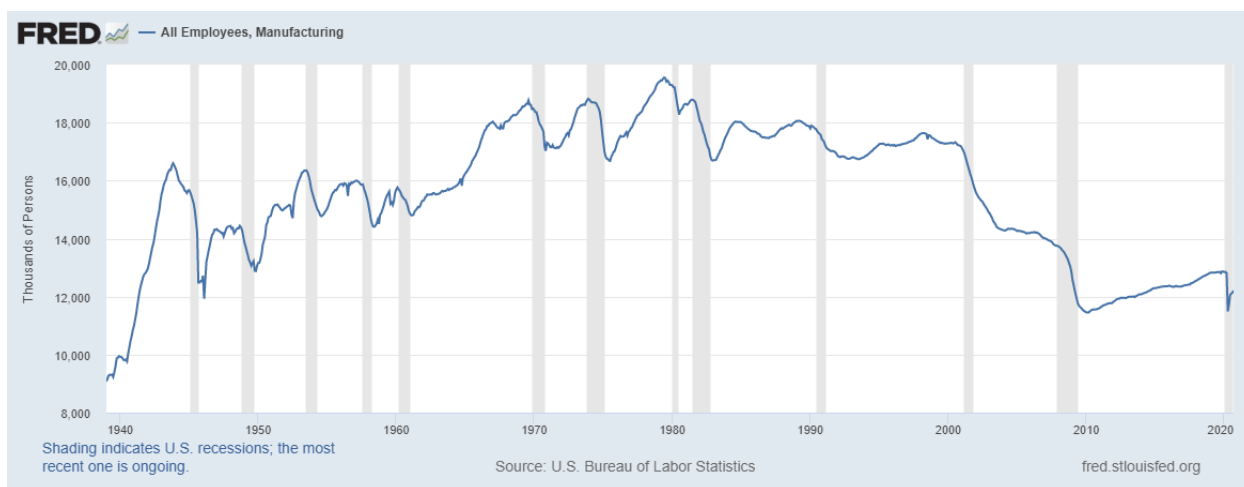


Figure 1: US Manufacturing Workers, 1939-2020, US Bureau of Labor Statistics

When a country group has its average employment rate higher after globalization, we assume it is Pareto better off, otherwise worse off. Note we judge Pareto improvement only by a higher average employment rate, seemingly ignoring change in productive efficiency. This is because in the context of globalization — but not under the scheme of import substitution industrialization — higher employment rate could only arise from moving workers in farming to manufacturing, with imported technologies from the North, which can only mean higher wage and higher productivity. Note also that in this dynamic setting, Pareto improvement is defined dynamically and in aggregation, without counting welfare changes at individual

level. As long as its average employment rate is higher after globalization, we assume on average agents are Pareto better off — even in countries facing the South-South competition with China — because their prior employment rate was strictly lower.

## 6 A Graphic Model of Globalization Backlash

Our model in Figure 2 looks different from a typical PPF in several ways. First of all, it contains four vertical lines to denote the average employment rates in the South *before* (EB(s)) and *after* (EA(s)) globalization, followed by the average employment rates in the North, also *before* (EB(n)) and *after* globalization (EA(n)). Since globalization is divided into three stages (see later discussions for details), the changes in average employments are more accurately in reference to Stage II of the globalization process.

Per the earlier discussions, Figure 2 is a *fractional*, *segmented* and *dynamic* model. It highlights the changes that caused backlash, divides globalization into three stages, and makes global tradeoff between labor efficiencies responsible for the backlash.

### 6.1 Segmented & Interior PPF Curves

For segmentation, we place the North and South in separate places with separate PPF curves. The South has a much lower wage level so its PPFs are located in the lower left corner, where not only the wage on the vertical axis is lower but also allocative efficiency on the horizontal axis, as shown by an EB(s) that is way to the left of EB(n), due to the majority of workforce in self-subsistent farms before globalization. Note the Southern PPFs do touch the vertical axis at both  $W0$  and  $W1$ , meaning at least some workers started from zero allocative efficiency, those who would have achieved great successes with their talents but were stuck to their survival-mandatory farms. Note also on a typical PPF productive inefficiency is shown as a single point beneath the PPF curve, but for our purpose, a single point does not allow us to track the dynamic changes so an entire curve is required.

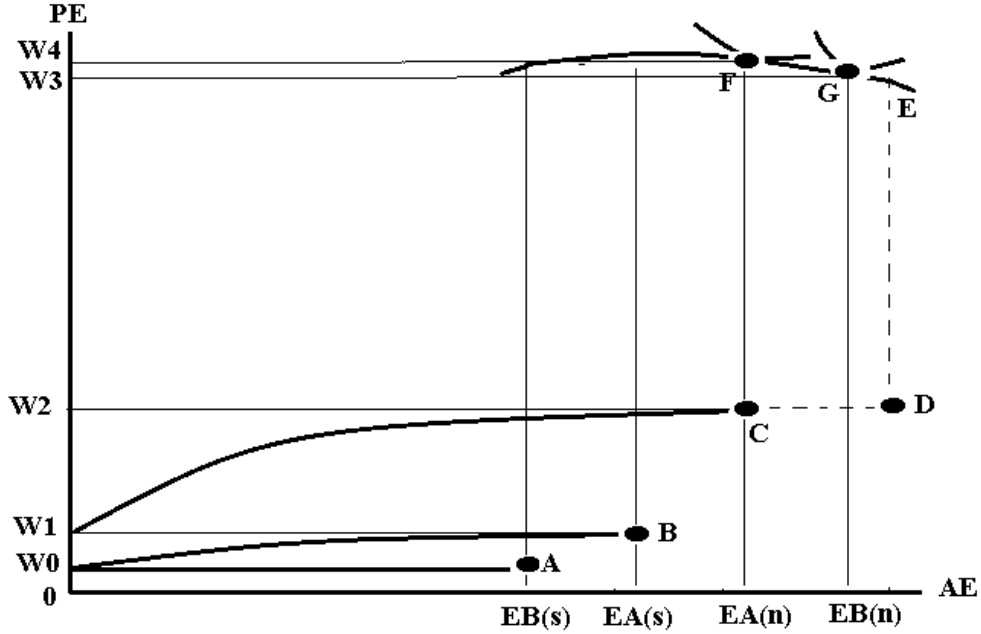


Figure 2: Globalization, Backlash & Labor Efficiency Tradeoff

The North also has a fractional, strictly *interior* PPF as the curve touches neither the vertical nor horizontal axis. It is high up on the vertical axis for the higher wage level and also to the right on the horizontal axis for high allocative efficiency. In addition, the North has only a single curve, unlike the South, to show its PPF continuity. There are also two points of tangency at  $F$  and  $G$ , which form a Pareto efficient contract curve from the indifference curves of labor supply and demand typically seen in an Edgeworth box. Not by accident but by design, these two “lens” of tangency cover the interior areas where the average employment rates before (denoted by  $EB(n)$ ) and after (denoted by  $EA(n)$ ) globalization locate. This is the places where the tradeoff between productive and allocative efficiencies is the most critical (and most realistic) to globalization and backlash, and also where the old and new equilibria are formed.



## 6.2 Three Stages of Globalization

Figure 2 also shows the trajectories of labor efficiency changes for the North and South over three stages, from the preparation for globalization at Stage I to its heyday of global production at Stage II, and finally the backlash in Stage III that we are currently in.

### 6.2.1 Preparing for Globalization

The mission of Stage I is to prepare for globalization by launching internal reforms in the South, and by clearing hurdles and barriers of free trade from the North. Two things stand out during this stage. The first is an emphasis on exchanges between the North and the South, which has been thoroughly carried out in later stages. The second is that both sides have played a sincerely cooperative game, which unfortunately has been switched to a large scale non-cooperative game between US and China in Stage III, although still mixed with cooperative game elsewhere.

Stage I was mostly about simple trade of imports /exports and much less about global production. The multinational enterprises from the North tried to enter the South in small steps, mostly through the international joint ventures (IJV, see Svejnar and Smith (1984); Chen, Chang, and Zhang (1995)). IJVs are more productive than the local enterprises but involved little labor movement across borders. Meanwhile, some Southern economies (notably the BRIC countries) had their own internal reforms or policy changes that helped raise productive and allocative efficiencies. China for example had its township and village enterprises (TVEs, see Perotti, Sun, and Zou (1999) for example), which improved both productive and allocative labor efficiencies without physically relocating workers even within the country. As a result, toward the end of Stage I, the South had a higher and more efficient employments, shown by a north-east moving curve past the lower average employment rate before globalization to the one after, with a higher productive efficiency at a slightly higher wage level.

We show these changes by moving the PPF from Point *A* at the EB(s) line to a higher

Point  $B$  at right by the end of Stage I, and further to Point  $C$  at Stage II, indicating consistent improvements over time for both productive and allocative efficiencies. Notice however between points  $B$  and  $C$ , only  $B$  is strictly and globally Pareto better off than  $A$  but not  $C$ . The latter pushes global employment from  $EA(s)$  to  $EA(n)$ , where the new average employment rate is strictly *higher* for the South but *lower* for the North, making the North strictly Pareto worse off. With higher productive efficiency, the South has two upward or positive sloping and concave growth curves going from the lowest wage level  $W_1$  to slightly higher  $W_2$  (Stage I), followed by a much higher  $W_3$  (Stage II).

### 6.2.2 The Heyday of Global Production

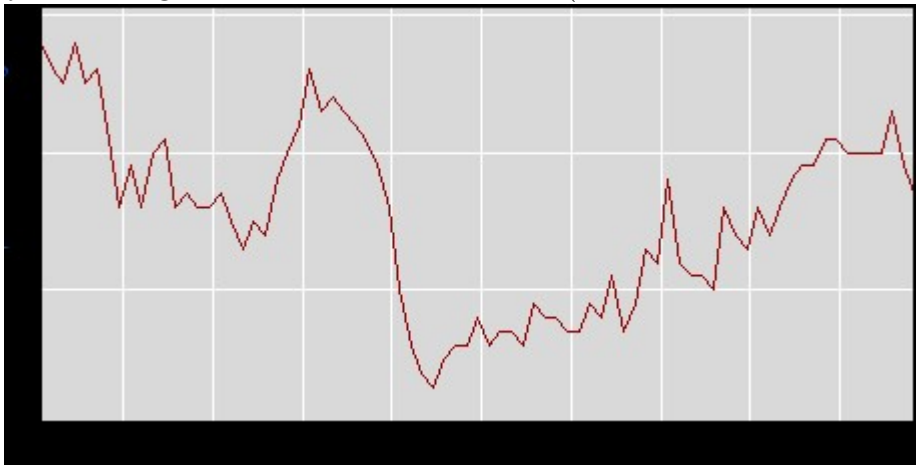
After Stage I, Stage II shifts gears to full global production — as prescribed by Smith & Ricardo. At the end of Stage II the productive efficiency in the South has reached its peak level — through imported technologies from the North but by now already embedded in the South. The corresponding end points of  $A$ ,  $B$  and  $C$  show that not only the productive efficiency is higher, as indicated by higher wages, but also the allocative efficiency moves to the right. Meanwhile, the North experienced a sector-wide exodus of (mature) manufacturing capacities, triggering a large scale global labor reallocation from North to South — without moving workers across borders.

What has been less noticed is that as global labor moved to the South, it pushed income up there, which in turn pushed up consumption demand, from self-sufficient goods to more capital intensive goods (e.g., durable goods, packaged goods, appliances). This shifted demand means an improved general equilibrium for labor allocative efficiency, because what is demanded is now being produced nearby — and more efficiently than ever before. Such a result was long desired — but failed to materialize — through the import substitution industrialization. We are able to reach the goal this time because of the cooperative game played by the North and South that leveraged the global divide.

Labor allocative efficiency in the North however is reduced with community-wide un-

employment, which shifts its employment rate from Point  $G$  based on  $EB(n)$  to  $F$  based on  $EA(n)$  on left, the peak level of unemployment after globalization. An increased local unemployment does not necessarily mean lower allocative labor efficiency, definitely not at the global level. It is a problem because three things happened simultaneously: (1) unemployment is a social bad; (2) Northern employers cannot — and would not — move employees across the border; (3) the Northern governments failed to help workers reallocate or reassigned.

Even with the bleak picture of unemployment, the North experienced slightly higher wage at  $W_4$  from  $W_3$ , partly from removing workers in the least value-added industries into unemployment. Figure 3 from Bureau of Labor Statistics confirms the trend: The percentage changes of all employees in the private sector, starts from 2001 and ends in 2020, has been steadily increasing from less than 1% in 2010 (due to the financial crisis) to about 3% in



2019.

### 6.2.3 Backlash By Perception, Progresses By Real Value-Added

The third and the most recent stage is dominated by backlash. While it is tempting to call it a “post globalization” stage, it would be inaccurate and even misleading. It is better to view the backlash as a normal part of globalization. Similarly, some choose to label the temporary public sentiments as “anti-globalization backlash,” although a head-on collision against globalization can be avoided easily. Stage III did not issue a death certificate for globalization, but rather is mixed with backlash and progresses. More importantly, global

production through global supply chains — the defining feature and the foundation of this globalization as we know it — remains strong, while the reversed flow of production from South back to the North is so far ignorable.

It is the decreased employment in the North that triggered backlash. However, as we pointed out earlier, unemployment itself may or may not lead to globalization backlash, there needs to be a “catalyst” that turns high unemployment rate into damaging perceptions. That catalyst has been the Trump administration, which created damages by wielding the “unfairness” populism card. Global production, with all its advantages and achievements so far, has been demonized and reduced to one thing: They stole our jobs and justice has to be restored by slamming tariff hike!

If we ignore the negative perceptions and focus on real value added gains instead, the situation is not bad even in this stage. Globally we have achieved a growth in both productive and allocative efficiencies. Even more interestingly, growth in productive efficiency was achieved without raising the global wage level because the center of global production has been moved to the South. This is shown by the projected (i.e., dotted) lines from Point  $C$  to  $D$  on the horizontal direction and from  $D$  to  $E$  on the vertical direction. Moving from  $C$  to  $D$  indicates improved global labor allocative efficiency as the global supply chains reached its full capacity. Point  $E$  transmits the gain in productive efficiency from the South to the North, which raises the global labor efficiency.

It is wrong therefore to think of globalization and its backlash as having equal power or equal probability to prevail. Instead, we should expect globalization and global supply chains to overpower the backlash, because real value added is hard to ignore and even harder to reject for any country in any negotiation. Perceptions matter and can deviate from reality, as correctly pointed out by Dluhosch (2018), but they can also be short-lived, especially when facts remain stable over time. When that happens, old perceptions will be replaced by new ones and the world will return to a new equilibrium (e.g., Point  $F$  in our model). Domestic politicians will find it difficult to destroy or to reverse the global supply chains entirely.

That said, trade wars and other conflicts are unlikely to go away, and we should expect future ebbs and flows, just like in the past (O'Rourke 2019), as long as (1) global economic divide sustains; (2) labors are continuously produced locally but allocated globally; (3) employment is globally preferred to unemployment and (4) governments fail to do their jobs to help reallocate workers.

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