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**Article**

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Wolfgang Lechthaler and Mariya Mileva

## Who Benefits from Trade Wars?

Even though economists keep on emphasising the benefits of international trade, protectionism is on the rise in many industrialised countries. The authors argue that a potential explanation for this phenomenon can be found in the short-run distributional effects of import tariffs: while protectionism hurts the economy from an aggregate perspective (i.e. GDP goes down), unskilled workers in import-competing sectors benefit in the short run and do not lose in the long run. They might therefore lend political support to protectionism.

Why has protectionism become so popular recently? Although good arguments have been put forward in favour of free international trade and the prospects of a potential trade war are particularly worrisome, many voters and politicians seem unimpressed. We argue that part of the explanation can be found in the short-run distributional consequences of protectionism. In this article, we discuss the optimal level of import tariffs from the point of view of heterogeneous workers. We show that unskilled workers in unskilled-intensive sectors might even benefit from a trade war.

The two most important arguments in favour of free international trade are, first, that it offers greater variety to consumers, and second, that it does so at a lower cost. Typically, different countries produce different varieties of similar goods, e.g. the various types of cheese produced in France and Italy. International trade enables consumers to enjoy a greater variety of consumption goods without the need to produce these goods domestically.

Apart from greater variety, international trade allows countries to specialise and concentrate their production in specific sectors. This specialisation makes sense if some countries are better at producing specific products or if they are more abundantly endowed with the factors necessary for the production of these products. In this

case, specialisation raises productivity worldwide and thereby lowers the cost of consumption in all countries.

But even in this situation, it is not a priori clear that free trade will prevail, because each country has an incentive to raise import tariffs. The reason is that imposing a tariff on imports has two counteracting effects. On the one hand, imports become more expensive, which is of course bad for consumers. On the other hand, the nominal exchange rate adjusts in such a way that a given value of imports can be financed with a lower value of exports. Trade economists call this effect the terms-of-trade externality.

However, this kind of reasoning only holds if a country can raise its import tariffs without its trading partner countries retaliating. If, instead, its trading partners also raise their import tariffs, then the terms-of-trade effect is (more or less) neutralised, resulting only in higher import prices. In this “trade war” scenario, all involved countries lose out from lower productive efficiency and higher consumer prices.

It is often argued that the threat of retaliation, i.e. the threat of a trade war, can contain protectionist tendencies. Even if a president would like to protect his country from Chinese competition by raising import tariffs, he might refrain from doing so because China would likely retaliate, and then both countries would lose out from a trade war. In this article, we argue that while this is true in aggregate, it might not be true for important parts of the workforce that could gain from a trade war and thus be willing to support protectionism – despite the likelihood of retaliation.

In our analysis, we put special emphasis on the distributional consequences of and the dynamic adjustment to protectionism in the form of import tariffs. Raising import tariffs not only makes imports more expensive, but it also

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implies an economic restructuring, because it reduces the incentives to specialise. Import-competing sectors face less competition from abroad and can expand. At the same time, exporting sectors become less competitive abroad due to adjustments in the nominal exchange rate and therefore contract.

Thus, an increase in import tariffs implies that production will be shifted from exporting sectors to import-competing sectors. This shift in production means that workers will also need to reallocate from the shrinking exporting sectors to the expanding import-competing ones. This reallocation takes time, is costly and affects different workers in different ways.

The restructuring of the economy also has implications for the demand of skills. Since skilled workers are more important in exporting sectors, while unskilled workers are more important in importing sectors, an increase in import tariffs implies that the demand for skilled workers goes down – as does the wage paid to skilled workers.

Due to these diverse effects, the impact of an increase in import tariffs on a worker depends on the worker's skill class, her sector of employment and the stage of the adjustment process. Consequently, the preferences of these workers in terms of import tariffs differ considerably, with unskilled workers in the import-competing sectors preferring especially high levels of import tariffs, while skilled workers in the exporting sectors prefer to abolish tariffs altogether. Importantly, we show that the unskilled workers in the import-competing sector would actually benefit from a trade war, while all other workers would lose out. Thus, if this group of workers finds strong political support, a trade war might be politically feasible, even if the economy as a whole would be adversely affected.

### Tariffs and inequality

To analyse the effect of an increase in import tariffs on heterogeneous workers, we use a model that is rich enough to encompass adjustment dynamics, worker reallocation and wage inequality, while not so complex that it would preclude intuitive interpretation. Lechthaler and Mileva describe the model used in more detail,<sup>1</sup> and the authors recently used the model to analyse optimal tariffs, providing the basis for this article.<sup>2</sup>

1 W. Lechthaler, M. Mileva: Trade Liberalization and Wage Inequality: New Insights from a Dynamic Trade Model with Heterogeneous Firms and Comparative Advantage, Kiel Working Paper No. 1886, Kiel Institute for the World Economy, 2013.

2 W. Lechthaler, M. Mileva: The dynamic and distributional aspects of import tariffs, Kiel Working Paper No. 2082, Kiel Institute for the World Economy, 2017.

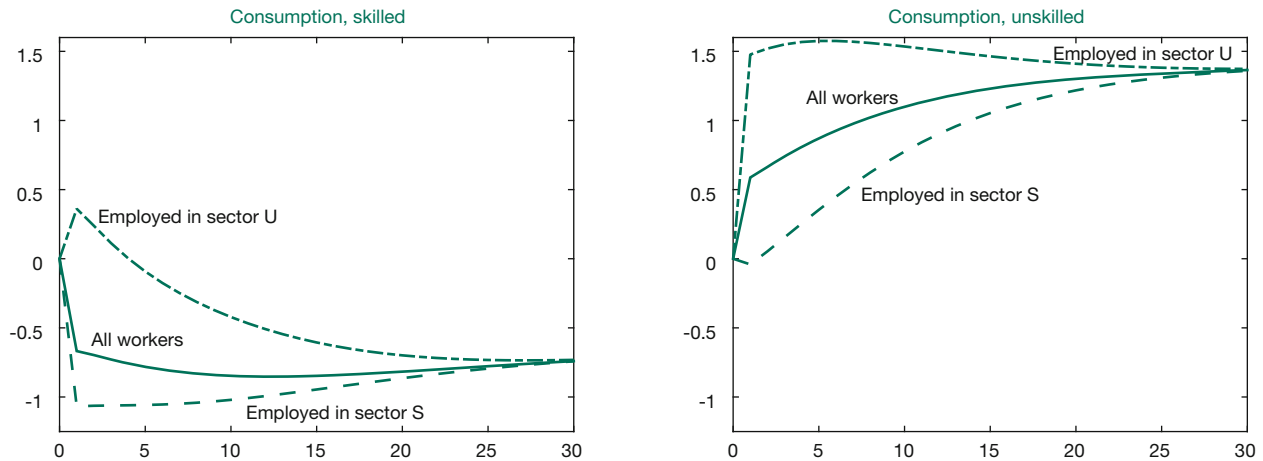
International trade between developed countries and developing countries is to a large degree inter-industry trade, so that, at the macroeconomic level, goods produced in one sector are exchanged for goods produced in another sector. To be able to capture this aspect of international trade, we use a model with two sectors, two factors of production and two countries. The factors of production in our analysis are skilled and unskilled workers. Both sectors use both types of workers, but they do so with different intensities. In combination with different relative endowments of skilled and unskilled workers across the two countries, this gives rise to comparative advantage. The country that is relatively more abundant in skilled workers has a comparative advantage in the production of the skill-intensive good. It therefore specialises its production in this sector, produces more than it consumes of that good and exports the difference. In return, it imports the good where it has a comparative disadvantage, allowing it to consume more of that good than it produces. An equivalent reasoning holds for the other country.

The magnitude of specialisation depends to a great extent on the cost of international trade. If international trade is very expensive, be it due to high transport costs, high tariffs or non-tariff trade barriers, it is not as profitable to specialise. The specialisation pattern also has important implications for inequality. In the developed country, international trade raises the demand for skilled workers, because the country specialises in the skill-intensive sector. This leads to a higher skill premium, i.e. the gap between the wages of skilled and unskilled workers.

To illustrate the effects of protectionism in the form of import tariffs, we calibrate the two model economies to replicate important features of the US and Chinese economies, respectively, and then simulate an increase in the tariff charged by the US on imports from China, keeping the tariff that China charges constant. While it might not be overly realistic to assume that the US could charge a higher tariff without any reaction from China, this case serves as a useful benchmark to understand the economic effects of changes in tariffs. The more realistic case in which China reacts to the US action by raising its own tariffs is illustrated further below.

The implications of an increase in the US import tariff for skilled US workers are illustrated in the left panel of Figure 1, and the implications for unskilled US workers are depicted in the right panel. The dynamic adjustment of workers' consumption after the tariff increase can be seen in both panels. In our model, a worker's consumption is the appropriate measure of her welfare, but note that this is driven primarily by her wage income. In each panel, consumption is plotted for three groups of workers:

Figure 1  
Effects of an increase in the US import tariff from 3% to 32.5%



Note: Quarters on the horizontal axis, per cent deviations from the old steady state on the vertical axis.

Source: Authors' own elaboration.

i) workers employed in the skill-intensive sector S (dashed lines), ii) workers employed in the unskilled-intensive sector U (dash-dot lines) and iii) both groups together (solid lines).

An increase in the US import tariff affects US workers mainly through three channels: i) the terms-of-trade externality, ii) the increased demand for the goods of the import-competing sector, which raises the demand for workers employed in that sector, and iii) the restructuring of the economy, which raises the demand for unskilled workers. The third channel mainly operates in the long run and the second channel only in the short run, while the first effect operates in both the short and the long run.

The terms-of-trade externality is caused by the fact that after the tariff increase, the US dollar appreciates relative to its trading partner's currency. That makes US exports more expensive relative to its imports, allowing it to consume more imports for a given level of exports.<sup>3</sup> The terms-of-trade externality raises aggregate consumption in the US.

For specific workers, however, additional effects play out which are not visible at the aggregate level. Here, the second channel is at play: the increase in the import tariff stimulates production in the import-competing sector and dampens production in the exporting sector. Conse-

quently, the demand for workers goes up in the import-competing sector and down in the exporting sector. The change in the relative demand for workers raises wages in the import-competing sector relative to wages in the exporting sector and induces workers to move from one sector to the other. As more and more workers move to the import-competing sector, the wage differential across the two sectors vanishes. However, the reallocation process is costly, and it takes a long time for the economy to fully adjust to the change in tariffs. As Figure 1 shows, the difference between the consumption of workers employed in the exporting sector and the consumption of workers employed in the import-competing sector only vanishes after seven years.

While the wage differential across the two sectors is only temporary and vanishes once the economy has adjusted, the wage differential between skilled and unskilled workers is permanently affected (the third channel). The reduction in international trade reduces the degree of US specialisation in the skill-intensive exporting sector. This reduces the demand for skilled workers so that their consumption in the new equilibrium is lower than before the tariff increase.

Figure 1 also reveals that the experience of workers can vary dramatically over time. For example, while skilled workers generally lose out in the long run, skilled workers in the import-competing sector might still benefit in the very short run. Skilled workers in the exporting sector, however, lose in the long run and lose even more so in the short run. The workers who benefit most from an increase in tariffs are the unskilled workers in the import-competing sector.

3 Another way to understand this is by noting that an import tariff is a tax on Chinese imports that generates additional income for the US, while the burden of the tax is split between the domestic and Chinese economies. In this way, the import tariff redistributes consumption from China to the US.

## Workers' preferences for tariffs

The analysis so far has demonstrated that the effects of changes in import tariffs are very diverse and depend on each worker's skill class and sector of employment, as well as the stage of the adjustment process. Figure 2 illustrates the implications of this experience for workers' preferences towards tariffs. The figure shows the preferred optimal tariff for each of the four worker groups depending on their "time horizon". The time horizon measures how forward-looking a worker is, i.e. how many periods in advance she considers when deciding on the optimal tariff. For example, the solid line illustrates that the optimal tariff for an unskilled worker in the skill-intensive, exporting sector is below 30% if she cares only about the next six years or less. However, she would prefer a tariff higher than 40% if she takes the next 50 years into consideration.<sup>4</sup>

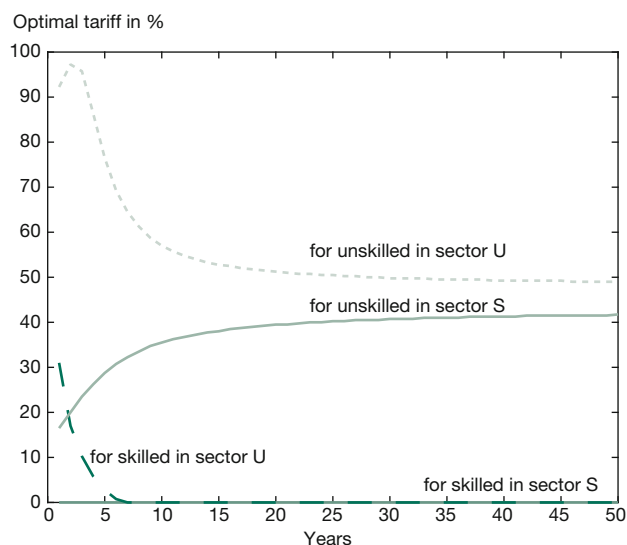
Why do unskilled workers in the skill-intensive sector prefer lower tariffs when they have a short time horizon? The reason is that in the short run, the sector of employment is more important, while in the long run, it is the skill class that carries more weight. In the short run, an increase in tariffs benefits workers in the skill-intensive sector very little, and it might even hurt them. This implies that a relatively low tariff would be optimal. For workers in the unskilled-intensive sector, it is the other way around: they benefit a lot in the short run and therefore prefer higher tariffs if they have a shorter time horizon.

In the long run, import tariffs benefit all unskilled workers, which explains why these workers tend to prefer higher tariffs. Even though in the long run all unskilled workers earn the same wage, those that are employed in the skill-intensive sector still prefer lower tariffs, even when they have a very long time horizon, because they fare relatively worse during the transition period (as illustrated in Figure 1).

Importantly, Figure 2 shows a huge range of optimal tariffs, going from 0% for skilled workers in the skill-intensive sector to almost 100% for unskilled workers in the unskilled-intensive sector with very short time horizons. These different perspectives are arguably hard to reconcile. Policy makers with short time horizons, induced by the electoral cycle, who want to appeal to unskilled workers and workers in import-competing sectors will find it tempting to resort to protectionism.

<sup>4</sup> Technically, the optimal tariff is the one that maximises the present discounted value of a worker's consumption for the next  $x$  years, where  $x$  is depicted on the horizontal axis.

Figure 2  
Optimal tariffs over time, by skill class and sector



Source: Authors' own elaboration.

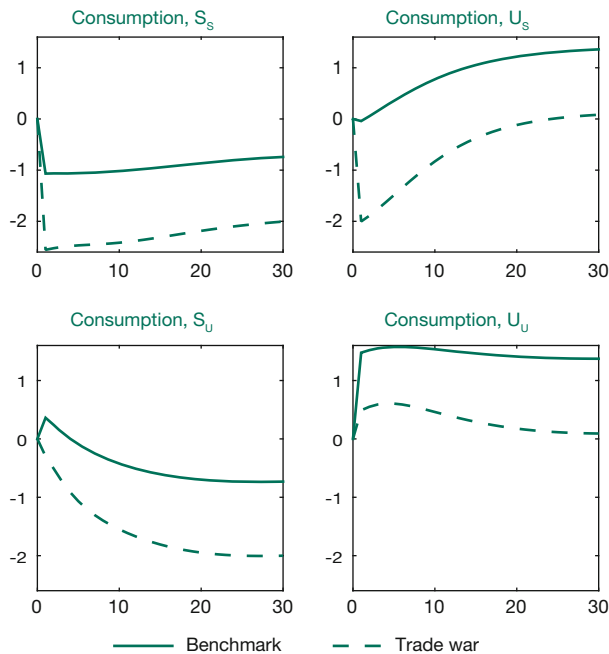
So far, the analysis has assumed that China does not retaliate by raising its own tariffs. The next section describes the case in which it does.

## Trade wars

One argument that is often brought forward against protectionism is the fear of retaliation, which could lead to a trade war. In such a scenario, both countries would raise their tariffs, and consequently the above-described terms-of-trade effect would no longer be at work. Taking an aggregate perspective, then, the consequences of raising import tariffs are strictly negative: more expensive imports, a globally less efficient production structure and thus lower aggregate consumption in both countries. Given these highly negative outcomes, policy makers should refrain from raising tariffs in the first place in order to avoid the risk of provoking a trade war.

However, as suggested by the previous analysis in this article, focusing on the aggregate perspective is very limiting, because tariff increases affect specific groups of workers in dramatically different ways. Even though the terms of trade do not change much in the case of a trade war, it is still the case that international trade becomes more expensive, making specialisation less attractive and initiating the same kind of adjustment and reallocation process as a unilateral change in tariffs. These effects are

**Figure 3**  
**Effects of a trade war on worker consumption, by skill class and sector**



Note: In the benchmark scenario, the US raises its tariff to 29%. In the trade war scenario, China retaliates by raising its tariff to 28.5%. Quarters on the horizontal axis, per cent deviations from the old steady state on the vertical axis.

Source: Authors' own elaboration.

missed in the aggregate perspective. Therefore, Figure 3 illustrates the development of consumption for our four worker groups during a trade war and compares it to the benchmark scenario in Figure 1, the unilateral increase in the US tariff.

Figure 3 confirms that the effects of a trade war are much worse than the effects of a unilateral increase in import tariffs. For all workers, consumption in the trade war scenario is substantially below consumption in the benchmark scenario. However, as in the previous scenario, the experience differs significantly across categories of workers. Once again, skilled workers are much worse off than unskilled workers in the long run, although the latter no longer experience large gains in consumption in a trade war scenario. Again, workers in the unskilled-intensive import-competing sector fare better than workers in the skill-intensive exporting sector in the short run.

However, the most notable result from Figure 3 is that unskilled workers in the unskilled-intensive sector still

experience meaningful gains in consumption in the short run, making them clear winners in a trade war scenario that is typically thought of as being bad for everyone. The same is not true for unskilled workers in the skill-intensive sector, who experience substantial losses in the short run, nor for skilled workers in the unskilled-intensive sector, who experience large losses in the long run.

Thus, a disaggregated perspective that looks at the experience of specific worker groups adds an important nuance to the analysis of trade wars. While it is still the case that a trade war is bad for both economies at the aggregate level, it is also the case that some workers can benefit even from such a scenario. This provides a potential explanation for the recent surge in protectionist tendencies in the US and in European countries.

## Conclusion

Using a dynamic model rich enough to incorporate different groups of workers, yet simple enough to yield intuitively appealing results, we analyse the distributional consequences of protectionism over time. If the US were to raise its import tariff without retaliation from China, the standard terms-of-trade externality would apply and aggregate consumption would rise. However, the effects are dramatically different across workers and time. In the short run, workers in the exporting sector lose as labour demand shifts towards the import-competing sector, while workers in that sector gain. In the long run, skilled workers lose as labour demand shifts toward the unskilled-intensive import-competing sector, while unskilled workers gain. Different types of workers have dramatically different preferences for optimal tariffs, and those preferences also depend on the time horizon. The sector of employment matters more for short-term-oriented workers, and the skill class matters more for long-term-oriented ones.

The distributional effects are similar in case of a trade war, i.e. if China responds to higher import tariffs in the US by retaliating in kind. During a trade war, the terms-of-trade externality no longer works and aggregate consumption falls. In the long run, skilled workers experience large losses in income and consumption, while unskilled workers are hardly affected. In the short run, workers employed in exporting sectors lose much more than those in import-competing sectors. In fact, unskilled workers in import-competing sectors actually gain in the short run. Thus, it is no wonder that, despite the overall negative effects, protectionism can find political support, even under the threat of a trade war, especially if re-election is only a few years away!