Researchers build quantitative model with the aim of imposing cost-efficient trade sanctions

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Global condemnation of Russia over its invasion of Ukraine has prompted the imposition of trade sanctions. Such measures are a form of

economic coercion, commonly used for reasons of foreign policy.

Trade sanctions can be put in place in an attempt to alter objectionable behavior—in Russia's case, waging a war—or to punish an offending state through the disruption of economic exchange.

"Sanctions can be in many forms and raising tariffs is one of them," says Yuan Mei, an Assistant Professor of Economics at Singapore Management University (SMU). Professor Mei is the co-author of a paper "(Trade) War and Peace: How to Impose International Trade Sanctions" that was published in the *Journal of Monetary Economics.*

The researchers have built a quantitative model of international trade with input-output connections, and the aim of the paper is to "compute the most cost-efficient way to impose trade sanctions against Russia in the context of the Russia-Ukraine war," Professor Mei says.

Willingness to pay

Trade sanctions are meant to hurt the sanctioned country's economy, but if they severely restrict trade, they can also hurt the sanctioning countries.

"Raising tariffs on Russian goods can hurt the Russian economy. In the meanwhile, this action could also hurt the sanctioning country by making imports more costly," Professor Mei says.

Under import restrictions, consumers in the imposing country may have limited choices of goods, which affects their welfare. And if export restrictions are imposed, or if sanctions prohibit companies in the imposing country from trading with the target country, the imposing country may lose markets and investment opportunities to competing countries.

To make sense of this apparent juggling act, the researchers offer the concept of "Willingness to pay"—the amount of economic burden an imposing country is prepared to incur to exact damage on the target country.

"We find that for countries with a low willingness to pay for sanctions, the optimal strategy is to impose a moderate and similar tariff across all products," Professor Mei says.

For example, if a sanctioning country is willing to sacrifice US$0.10 per US$1 loss incurred by the Russian economy, the cost-efficient trade sanction would be a uniform tariff of 20%.

The effect would be that "Russia's export to the sanctioning countries will decrease, which eventually leads to less national income. In this scenario, the eventual welfare (real GDP) loss of Russia is 1.2% based on our calculation," he says.

Key exports

"For countries with a high willingness to pay for sanctions, sanctioning countries should target what Russia exports the most—mining and energy products," Professor Mei says.

In fact, the U.S., the European Union (EU), the G7 and sanctioning allies such as Australia have recently prohibited the import of seaborne crude oil and refined petroleum products from Russia. Is this a step in the right direction?

"Yes. Our simulation results show that countries with high willingness to pay should impose an embargo on Russia's oil and energy exports, and these countries do appear to have a high willingness to pay," Professor Mei says.

But Russia has found alternative markets, notably in India, which is happy to buy discounted crude oil, reportedly in huge quantities. And China, Russia's largest trading partner, has supported what Russia calls its "special military operation" in Ukraine. Can trade sanctions be effective without unified global support?

"That depends on the definition of effective sanction," Professor Mei says. "In the paper, we consider an alternative scenario in which the non-sanctioning countries join the U.S., EU and their allies to sanction Russia. In this case, the maximum welfare loss on Russia increases from 2% to 6%, which we consider a significant increase."

But the economic effect of the existing sanctions regime on non-sanctioning countries does not seem like an incentive to change position.

"The rest of the world (ROW) boosts its exports in reaction to sanctions placed on Russia. As sanctioning countries raise tariffs against Russia, sanctioning countries substitute imports from Russia with those from the ROW. This pattern, referred to as the trade diversion effect, leads to an increase in ROW exports to the sanctioning countries," Professor Mei says.

Carrying the burden

The researchers note that Russia exports much more to the EU—the world's largest trading bloc—than to the U.S. or other sanctioning allies (OSA). Accordingly, tariffs imposed by the U.S. or OSA can, at most, reduce Russian real income by only 0.07% or 0.22%, respectively. By contrast, the EU alone can reduce real income in Russia by as much as 0.8%. Therefore, the burden of trade sanctions against Russia would seem to fall on the EU.

"We are not saying that the EU has to carry the burden. To be more

accurate, our message is the EU is the group of countries that can hurt the Russian economy the most—not the U.S. or other sanctioning allies," Professor Mei says.

Sanctions, of course, can go both ways. Russia could retaliate by levying tariffs on the U.S. and Europe, but Professor Mei's research suggests it would hurt Russia even more.

"If Russia also chooses tariffs to punish the sanctioning countries, the economic consequence of tariff sanctions on Russia would more than double," he explains. "The EU is an important importing origin for Russia but Russia is not an important exporting destination for the EU. Therefore, Russia imposing retaliatory tariffs on EU would result in a large decline in its own welfare, but it does not decrease EU welfare much."

More information: Gustavo de Souza et al, (Trade) War and peace: How to impose international trade sanctions, *Journal of Monetary Economics* (2024). DOI: 10.1016/j.jmoneco.2024.103572

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