

RESEARCH BRIEF

Production, Relocation, and Price Effects of US Trade Policy: The Case of Washing Machines

Based on BFI Working Paper No. 2019-61, “[The Production, Relocation, and Price Effects of US Trade Policy: The Case of Washing Machines](#),” by Aaron Flaaen, economist, Federal Reserve Board; Ali Hortaçsu, professor of economics, University of Chicago and co-director of BFI’s Industrial Organization Initiative; and Felix Tintelnot, assistant professor of economics, University of Chicago and associate scholar of BFI’s International Economics Initiative and Industrial Organization Initiative

KEY TAKEAWAYS

- ✓ Washing machines have been the subject of trade disputes and tariffs since 2012
- ✓ Prices, though, decreased between 2012 and 2017 as manufacturers moved production to countries unaffected by tariffs
- ✓ In 2018, though, global tariffs were applied to all washers imported to the US
- ✓ Prices increased about 12 percent for both washers and dryers, a complementary good not subject to tariffs

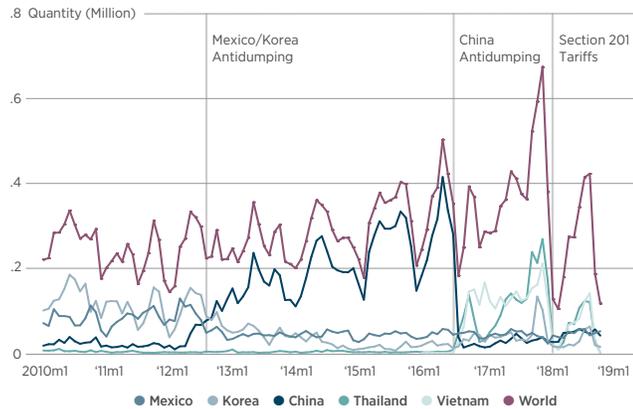
If you were thinking about buying a washing machine sometime in 2017, you may have been tempted to wait a little while for prices to fall. After all, prices had been dropping for about five years, so unless your current washer was inoperable, there was little reason to make a purchase in haste.

Hopefully you didn’t wait too long. Following the late-2017 announcement of tariffs on all washers imported to the United States, prices increased by about 12 percent in the first half of 2018 compared to a control group of other appliances. In addition, prices for dryers—often purchased in tandem with washing machines—also rose by about 12 percent, even though dryers were not subject to a tariff.

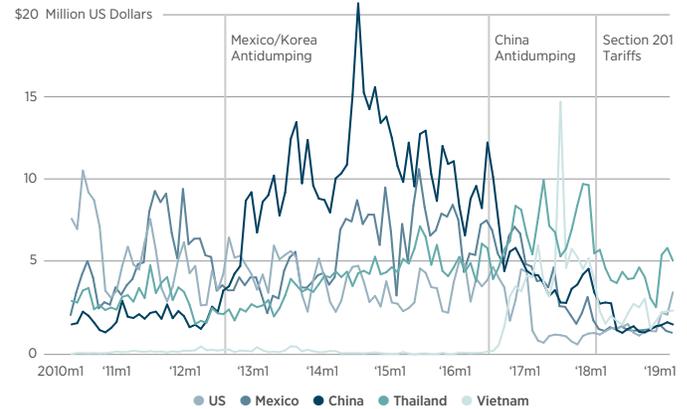
On the one hand, these price increases were unsurprising given the tariff announcement. On the other hand, washers had been the subject of multiple import restrictions since 2012 and the price of this ubiquitous household appliance had actually declined over the ensuing years. What happened in 2018 that caused washing machine prices to spike?

Figure 1 • US Washing Machine Imports and Korean Washing Machine Part Exports by Country

A. Monthly US Imports of Washing Machines by Country



B. Monthly Korean Exports of Washing Machine Parts



How did the price of washing machines continue to slide post-2012 when the industry was subjected to antidumping duties on imports from selected countries to the United States? Aaron Flaaen, Federal Reserve Board economist, Ali Hortaçsu, UChicago professor of economics, and Felix Tintelnot, UChicago assistant professor of economics, address these and other questions in their working paper, “The Production, Relocation, and Price Effects of US Trade Policy: The Case of Washing Machines.” Their work is preliminary and ongoing, but they find that the clear losers from such tariffs are the consumers of targeted products.

Global tariffs find their way to the consumer

In December 2011, an anti-dumping investigation against South Korea and Mexico was announced by the US International Trade Commission (USITC): the two countries, which were the leading exporters of washing machines to the US, were charged with dumping washing machines onto the US market with artificially low prices, and thereby harming US domestic producers. Tariffs were soon placed on washing machines imported to the US from South Korea and Mexico.

Normally, such a restriction in supply, assuming continued demand, would increase prices. However, just one month after the anti-dumping investigation was announced, imports of washing machines from South Korea and Mexico started to fall while the majority source of import imports shifted to China.

Indeed, as Figure 1 illustrates, China quickly became the largest exporter of washing machines to the United States, essentially trading places with South Korea.

This shift in trade patterns demonstrates that washing machine manufacturers responded to the country-specific tariffs by simply moving production to a different country. Following this shift, China remained the leading exporter of washing machines to the US into 2016. Eventually, though, US domestic producers appealed to the USITC, and an anti-dumping investigation was announced against China. By July 2016, when an anti-dumping order was issued, imports of washers from China had fallen below Thailand and Vietnam, where new production facilities were already operating.

After this second round of “country-hopping” these tariffs, in February 2018, the US applied a world-wide tariff on imports of washing machines. Imports of washers to the U.S. spiked at the end of 2017, then fell back steeply once the tariffs were applied: evidence of strategic use of anticipatory “front-running” of tariff changes.

While the country of origin for washing machines changed quickly over the previous six years, one thing remained the same for consumers: prices continued to decline over that period. However, as described above, following the application of broad tariffs on all washer imports, the price of washing machines increased roughly 12 percent in 2018.

Importantly, and somewhat surprisingly, prices also rose at the same rate for dryers, a complementary good that was not subject to tariffs. All brands (both domestic and foreign) show notable price increases following these 2018 tariffs.

One revealing finding in this work is the tight price relationship between washers and dryers, even when washers, for example, are the product that is subject to tariffs. Among the five leading manufacturers of washers, roughly three-quarters of models have matching dryers. When the authors compare only electric washers and dryers, they show that in about 85 percent of the matching sets, the washers and dryers have the same price.

Finally, one promise of increased tariffs is to drive manufacturing “home” and thus increase employment as foreign-made goods become more expensive. To this point, Samsung has opened a South Carolina plant in January 2018 with plans to hire 1,000 new workers by 2020, LG is scheduled to open a Tennessee plant offering 600 jobs by sometime in 2019, and Whirlpool has announced the addition of 200 workers to existing domestic production. While on the surface it appears that the global tariffs of 2018 were a successful policy outcome, the results of the paper show the costs for consumers associated with these new jobs.

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The increases in consumer prices described above translate into a total consumer cost of \$1.5 billion per year, or about \$820,000 per new job.

As this description of the authors’ research reveals, tariffs imposed on individual countries can result in “country-hopping” by producers, which can actually result in lower production costs and, conceivably, lower costs for consumers. However, when global tariffs are applied, production-shifting is no longer profitable. This may shift some jobs to the tariff-imposing country—in this case the US—but at a steep price that will find its way to the final product, where consumers will pay the price.

Conclusion

Tariffs increase the cost of doing business, which often leads to increased prices for intermediate goods (those used in production) and final goods (those purchased by consumers and businesses). However, tracing the impact of a tariff through the production and delivery of a particular good is difficult; the effort is often inhibited by incomplete or private data that companies hold close. The case of washing machines, though, offers a clear view on the impact of global tariffs for a particular product. Indeed, as this research reveals, complementary goods—in this case, dryers—can also be affected. However, when single-product tariffs are applied to individual countries, production may shift to another country and could actually lower production costs and, thus, prices for consumers.

Can these lessons be applied to other consumer products that are impacted, say, by other tariff increases or other restrictive measures? It may be too early to tell. The case of washing machines is special in that tariffs were placed on a particular product for which the authors were able to attain relevant data. For most products, such data are unavailable and it will likely take time for increased prices to reveal themselves in the data.

In the end, there are two lessons for policymakers, according to this research: tariffs applied to individual countries may be ineffective, and tariffs applied globally tend to result in significant costs to consumers. Possible winners are domestic producers that benefit from increased market share, as well as those domestic workers employed in washing machine production. Those jobs can come at a steep price, though, as the example of washing machine production shows: \$820,000 per job. Consumers not only pay a higher price for finished goods from global tariffs, but they can also suffer an efficiency loss; for example, households that cannot afford new products because of price increases cannot benefit from the improved performance that such products offer. With the increased use of trade policies by the United States, the authors recommend more research into the interactions between firm-level decisions and the effects on consumers and the broader economy.

CLOSING TAKEAWAY

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READ THE WORKING PAPER

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