

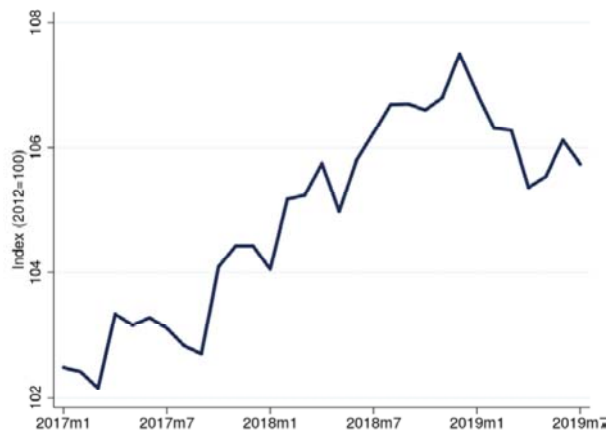
BOARD OF GOVERNORS OF THE FEDERAL RESERVE SYSTEM
DIVISION OF RESEARCH AND STATISTICS

Date: August 26, 2019
To: Stacey Tevlin
From: Aaron Flaaen and Justin Pierce
Subject: Effects of Recent Tariffs on Manufacturing Output

Summary

After two years of robust gains, manufacturing industrial production (IP) declined by more than 1.5 percent from December 2018 to July 2019 (Figure 1). Notably, this decline followed shortly after the U.S. imposed substantial tariffs on some imports and U.S. trade partners retaliated with tariffs on some U.S. exports. In this memo, we describe our estimates of the effect of tariffs imposed since the start of 2018 on manufacturing IP growth using industry-level measures of exposure to tariffs.¹ We find that **rising input costs and retaliatory tariffs can account for around half of the recent decline in manufacturing IP growth.**

Figure 1: Manufacturing IP (Index)



Approach

Our analysis uses data on tariff exposure and IP growth at the industry-level. For each industry, we construct measures of three potential effects of tariffs using the published lists of products subject to tariffs, in addition to detailed data on industry output, imports and exports:

- 1) **Import protection** – U.S. tariffs on some industries’ products protect them from foreign competition, which may *boost domestic output*.
 - Measure: Value of imports of an industry’s products subject to U.S. tariffs divided by domestic absorption (output + imports – exports)
- 2) **Foreign Retaliation** – U.S. trade partners retaliate by imposing tariffs on exports of some U.S. industries, which may *lower domestic output*.

¹This analysis considers the effects of tariff increases that have already occurred, but does not explicitly account for the effects of trade policy uncertainty, which may further contribute to the manufacturing downturn.

- Measure: Value of an industry’s exports subject to retaliatory tariffs divided by value of industry output
- 3) Rising Input Costs – U.S. tariffs raise input costs for some industries, which may *lower domestic output*.
- Measure: Value of imports of an industry’s inputs subject to tariffs divided by cost of production

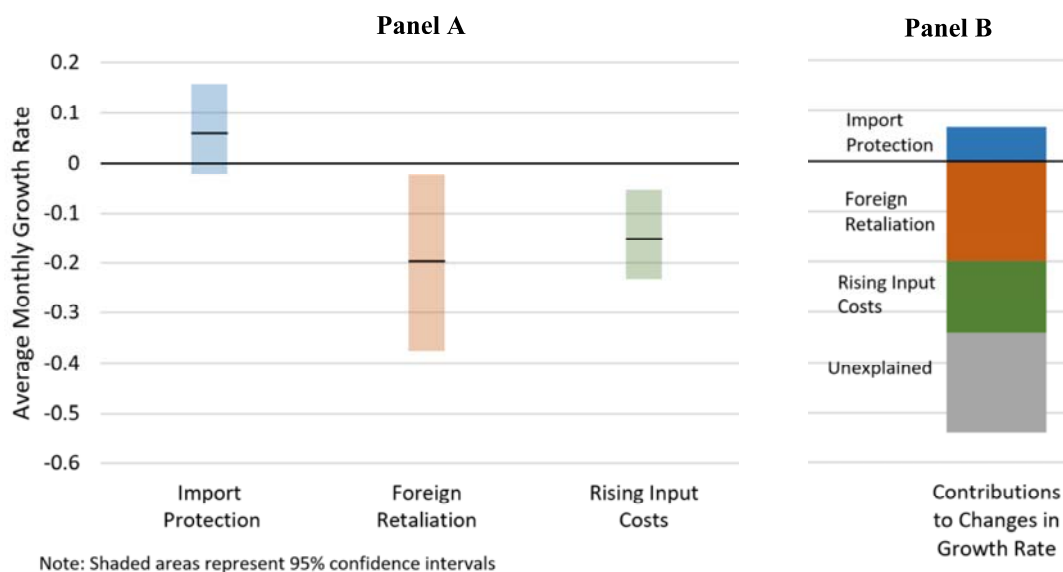
We define the change in IP growth for each industry as the difference in average monthly growth rates between two periods: July 2017 to June 2018, when manufacturing IP was growing, and December 2018 to July 2019, when manufacturing IP growth turned negative.

We estimate the relationship between this change in growth rates and the measures for each of the three channels noted above in a simple ordinary least squares regression. In addition, we control for the share of each industry’s output that is exported and the share of domestic absorption that is imported, to account for general exposure to international conditions such as changes in the value of the dollar and foreign GDP growth.

Results

Panel A of Figure 2 reports the estimated effects of each tariff channel on the change in average manufacturing IP growth (black lines) within their 95 percent confidence intervals (height of bars). As shown in the panel, we find that industries more exposed to foreign retaliation (in orange) or rising input costs via tariffs (green) have experienced statistically significant lower IP growth, consistent with our expectations. There is a positive relationship between import protection and output growth (in blue), but the relationship is not statistically significant. Panel B of Figure 2 shows that, combined, these tariff effects account for around half of the decline in manufacturing IP experienced since December 2018. Our analysis, therefore, still leaves room for other factors—such as effects from elevated trade policy uncertainty and the recent slowdown in business investment—to play a role in the manufacturing downturn.²

Figure 2: Estimated Tariff Effects on Growth Rate of Manufacturing IP



² The Beige Book and various manufacturing surveys contain widespread references of firms citing trade-policy uncertainty as a significant reason for reduced or delayed capital expenditures. While these effects might be significant, quantifying this additional trade-related channel is beyond the scope of this analysis.

Caveats

Our analysis considers only the effects of currently-imposed tariffs and does not explicitly control for effects related to trade policy uncertainty. In addition, the reported results are somewhat sensitive to the time periods being considered. For example, rather than focusing on the period since December 2018—when manufacturing IP began to decline—one could begin the comparison in September 2018, when the bulk of the tariffs were already in place. Under this alternative comparison, the estimated effect of tariffs on IP growth is roughly halved, and the estimates are less precise.

Conclusion

We find evidence that about half of the recent slowdown in manufacturing IP growth can be attributed to the imposition of tariffs, specifically due to foreign retaliation and rising input costs, though this result is somewhat sensitive to the time periods considered. We find no evidence that tariffs have boosted manufacturing IP growth, a hypothetical possibility given that the manufacturing sector has been protected by import tariffs.