# THE EFFECTS OF TARIFF RISK ON FINANCIAL MARKETS

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*This work uses a heteroskedasticity based estimation approach to identify the effects of tariff risk on U.S. Financial markets and the Forex Market. The "Tariff Risk" factor accounted for a considerable portion of the total variance in the S&P500 and XLY ETF*

**Approach**: The first step involved identification of days on which the variance of Tariff Risk was elevated (mainly due to new developments in the administration's tariff plans reflected in the News). I collected a list of 18 such days on which tariff related news seemed to be the main driver of market movements. For identifying the set of days with low variance, days as close to the high variance days were chosen to minimize the effects of changes in other factors.

I used the high-yield spread as the instrumental variable instead of the 2-year Treasury rate, as the high-yield spread exhibited a logical and observable relationship with tariffs: widening when tariffs were imposed and narrowing when they were lifted. I then measure the impact of increase in tariff risks/imposing tariffs that is large enough to cause a 60 bp rise in the high-yield spread (the max observed rise in high-yield spread in the data is of 19bp). This idea is also supported by the drastic changes in mean and variance of changes in high yield spread from low to high variance tariff days seen in Table 3.

The two estimators used for measuring the sensitivity of the price of the security due to increased tariff risks are calculated. Table 2 shows the calculated sensitivities. The primary finding of this work is that the financial markets are significantly affected by the risk of war. Table 3 explains the amount of increased variance on high-tariff variance days explained by the "tariff-risk" factor.

**Results:** An increase in the risk of tariff/ implementation of tariffs which leads to a shock of 60 bp in the high-yield spread results in a drop of 13.36 % in the S&P 500 and a drop of 14.68% in the XLY (consumer discretionary ETF) and a significant part of the historical variance has been explained by the tariff-risks. Furthermore, it results in a stronger dollar (+26.83%) and weaker Canadian dollar (-7.45%) and Chinese Yuan (-2.62%), rising gold prices (+23.37%) and falling oil prices (-$14.62). The results also suggest a bull steepener where the 2-year yield falls much faster than the 10-year yield which could be pointing to the longer-term benefits of tariffs, but the results are not very significant because only 5% of the variance could be explained by tariff-risk.

## *Dates of High variance of Tariff Risk*

| Date | Countries | Event | Tariff Risk |
|---|---|---|---|
| 1/20/2025 | CA MX | President Trump promises 25% tariffs on imports from Canada and Mexico starting on Feb. 1 | Increase |
| 1/26/2025 | CO | Immediate impose of 25% tariffs on goods from Columbia and would be raised to 50% in 1 week | Increase |
| 1/27/2025 | CO | Suspension of the previously ordered tariffs | Decrease |
| 2/1/2025 | CA MX CN | 25% tariffs from on all goods from Canada and Mexico and 10% tariffs on China starting on Feb. 4 | Increase |
| 2/3/2025 | CA MX EU | Agreement for a 30-day pause of tariffs on Mexico, Canada and threats of new tariffs against EU | Decrease |
| 2/4/2024 | CN | 10% tariffs on China went into effect and China retaliated with additional tariffs | Increase |
| 2/7/2025 | World | Idea of reciprocal tariffs on other countries introduced | Increase |
| 2/10/2025 | World | News on 10% tariffs on all foreign steel and aluminum imports | Increase |
| 2/13/2025 | World | President Trump describes his plan for a broader reciprocal tariff | Increase |
| 2/14/2025 | World | Plan to impose unspecified tariffs on foreign cars on April 2 | Increase |
| 2/27/2025 | CA MX CN | Conformation of tariffs to go into effect on March 4 as scheduled | Increase |
| 2/28/2025 | MX | Mexico Open to New Tariffs on China to Avoid US Tariffs | Decrease |
| 3/3/2025 | | Lutnick again says it's possible the tariffs don't go into effect, but President Trump later confirms they will. | Unclear |
| 3/4/2025 | CA MX CN | Tariffs go into effect; Canada responds with 25% tariffs | Increase |
| 3/5/2025 | CA MX | President Trump announces to pause tariffs on cars coming from Canada and Mexico for a month | Decrease |
| 3/6/2025 | CA MX | Many tariffs placed on Canada and Mexico are suspended | Decrease |
| 3/10/2025 | CA CN | China begins to impose tariffs on farm products from USA, Ontario announces tariffs including 25% surcharge on electricity exported to US states | Increase |
| 3/11/2025 | CA | President Trump threatens to double tariffs on Canadian steel and aluminum | Increase |
| 3/12/2025 | CA EU | EU and Canada announce retaliatory tariffs on US goods [EU holds back until April 1 – making it clear they would like to negotiate] | Unclear |
| 3/13/2025 | EU | President Trump announces plans for 200% tariffs on alcoholic products from EU | Increase |

Note: I did not consider the investigation into whether the imports of lumber (1st March 2025) and foreign copper production (25th Feb 2025) posed a national security threat and potential tariff threats, as these did not present a direct risk of imposing tariffs.

Note: For low tariff days, I considered the days right before tariff announcement days to minimize the effects of changes in other factors.

## *Estimated Impact of Increase in Tariff Risk*

| Variable | Units | Estimate 1 | Estimate 2 |
|---|---|---|---|
| High Yield Spread | pp | 0.60 | 0.60 |
| 2-year Treasury yield | pp | -0.78 | -0.10 |
| 10-year Treasury yield | pp | -0.41 | -0.09 |
| Dollar (Broad Index) | pct | 26.83 | 0.92 |
| CAD_USD | pct | -7.45 | -0.99 |
| PESO_USD | pct | 42.92 | 0.65 |
| CNY_USD | pct | -2.62 | -0.62 |
| S&P500 | pct | -13.36 | -7.24 |
| XLY | pct | -14.68 | -9.72 |
| Manufacturing ETF | pct | -19.10 | -2.88 |
| GOLD | pct | 23.37 | 1.92 |
| OIL FUTURES | $ | -14.62 | -1.15 |
| TIPS ETF | pct | 3.05 | 1.06 |
| BBB Yield Spread | pp | 0.12 | 0.11 |
| 10-year Breakeven Inflation | pp | -0.04 | -0.05 |
| 10-year Implied Inflation | pp | -0.57 | -0.02 |

Note: The estimates are the impact of the war risk factor for each variable multiplied by 0.6
pp: percentage points; pct: percentage change; $ dollar value

$$\text{Estimator1} = \frac{\text{covH}(\Delta x_2, \Delta x_2) - \text{covL}(\Delta x_2, \Delta x_2)}{\text{covH}(\Delta x_1, \Delta x_2) - \text{covL}(\Delta x_1, \Delta x_2)}$$

$$\text{Estimator2} = \frac{\text{covH}(\Delta x_1, \Delta x_2) - \text{covL}(\Delta x_1, \Delta x_2)}{\text{covH}(\Delta x_1, \Delta x_1) - \text{covL}(\Delta x_1, \Delta x_1)}$$

*Variances of Financial Variables*

| Variable | Mean on L days | Mean on H days | Variance on L days | Variance on H days | % change in variance | % Explained variance on H days |
|---|---|---|---|---|---|---|
| High Yield Spread | 0.0006 | 0.0355 | 0.0022 | 0.0059 | 169.41% | - |
| 2-year Treasury yield | -0.0041 | -0.0137 | 0.0016 | 0.0024 | 48.95% | 5.73% |
| 10-year Treasury yield | -0.0099 | -0.0142 | 0.0029 | 0.0030 | 4.41% | 4.31% |
| Dollar (Broad Index) | -0.5071 | -0.2462 | 0.1278 | 0.4173 | 226.38% | 2.61% |
| CAD_USD | -0.1593 | 0.0998 | 0.0863 | 0.1992 | 130.84% | 6.97% |
| PESO_USD | -0.0205 | 0.0213 | 0.2765 | 0.6606 | 138.95% | 0.96% |
| CNY_USD | 0.0183 | 0.0529 | 0.0462 | 0.0612 | 34.29% | 8.67% |
| S&P500 | -0.0502 | -0.4368 | 0.3947 | 1.5914 | 303.22% | 43.83% |
| XLY | -0.3677 | -0.5478 | 0.8281 | 2.6560 | 220.69% | 47.12% |
| Manufacturing ETF | 0.1679 | -0.5032 | 0.8148 | 1.2923 | 58.61% | 7.88% |
| GOLD | 0.1825 | 0.2977 | 0.4944 | 1.0391 | 110.14% | 4.82% |
| OIL FUTURES | -0.3200 | -0.3033 | 1.1069 | 1.2253 | 10.69% | 1.49% |
| TIPS ETF | 0.0548 | 0.0863 | 0.0715 | 0.1064 | 48.59% | 14.74% |
| BBB Yield Spread | 0.0018 | 0.0089 | 0.0002 | 0.0003 | 80.02% | 58.22% |
| 10-year Breakeven Inflation | -0.0037 | -0.0061 | 0.0004 | 0.0004 | -11.01% | 10.48% |
| 5-year Implied Inflation | -0.0050 | -0.0027 | 0.0006 | 0.0008 | 27.69% | 1.50% |