

Export Performance under US Tariff Pressure: A Time-Series Study of Bangladesh, 2001–2025

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Export Performance under US Tariff Pressure: A Time-Series Study of Bangladesh, 2001–2025

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1. Abstract

This study examines whether changes in the US tariff on Bangladeshi goods, the tariff faced by a key competitor (Vietnam) and domestic macro-financial conditions are associated with Bangladesh's exports to the United States. Recent evidence shows that US tariffs fall largely on importers and redirect sourcing toward third countries, so the effect on a garment exporter is an empirical question. Annual data for 2001–2025 are analyzed with Dickey–Fuller tests and OLS regression on differenced series. Exports, the Bangladesh tariff and the oil price are stationary in first differences, while the exchange rate and remittances need second differences. The model is not jointly significant as $F(7,15) = 1.37$, $p = 0.287$; adjusted R-squared = 0.11. The Bangladesh tariff coefficient is positive and insignificant where $p = 0.642$, and the competitor tariff is also insignificant where $p = 0.983$. Only the oil price is significant where $p = 0.016$. Diagnostics reveal no serious heteroskedasticity, multicollinearity or autocorrelation. Because both tariff series barely vary before 2025, the findings are exploratory and cannot establish a causal tariff effect. The study offers a transparent baseline for future research.

Keywords: US tariffs; Bangladesh; exports; trade diversion; time series; OLS

2. Introduction

2.1 Background

Bangladesh is among the world's largest apparel exporters, and ready-made garments make up the overwhelming share of its merchandise exports. No other country buys more Bangladeshi goods than the United States, which takes roughly eight billion US dollars of garments every year (The Business Standard, 2025). Export earnings support growth and employment, particularly of women, and finance imports of raw materials and capital goods.

That dependence showed itself to be a vulnerability in April 2025 when Washington announced reciprocal tariffs that initially put Bangladesh at 37 percent (The Business Standard, 2025). The rate was later revised through several steps toward roughly 19–20 percent under bilateral negotiations (Office of the United States Trade Representative, 2026a, 2026b; The Business Standard, 2025). Such abrupt changes raise the landed cost of Bangladeshi goods, create uncertainty for buyers who place orders months ahead, and may redirect sourcing toward competitors such as Vietnam, India and Cambodia. Apparel is also a sensitive category: even before the recent measures, textiles and apparel faced far higher US duties than the average product, with textiles averaging 11.5 percent against 1.42 percent for all goods in 2017 (York, 2018).

The wider literature shows why this matters beyond Bangladesh. Recent US tariffs have reorganized supply chains away from China toward third countries (Ossa & Redding, 2026),

and general-equilibrium estimates suggest that Southeast Asian exporters can gain from such diversion (Li et al., 2020). Whether a lower-income apparel exporter gains or loses therefore depends on its tariff relative to competitors, on its price competitiveness, and on the financial buffers that keep its factories supplied with imported inputs. These conditions make Bangladesh an informative case for studying how trade policy shocks reach a small open economy.

2.2 Research Problem

Policymakers, exporters and commentators have attributed recent volatility in Bangladesh's export performance to the new US tariff regime. Yet Bangladesh simultaneously faces a depreciating taka, fluctuating remittance inflows, a strained foreign-exchange reserve position and volatile energy prices. It is not established how much of the movement in exports to the United States is associated with tariff changes as distinct from these macro-financial factors.

The problem is practical as well as academic. Exporters need to know whether order losses reflect tariffs, a weaker currency, scarce foreign exchange or global input costs, because each calls for a different response, ranging from negotiation and market diversification to exchange-rate and reserve management. Without evidence that separates these influences, policy risks being aimed at the wrong target.

2.3 Research Gap

Most quantitative work on recent US tariffs concerns the 2018–2019 US–China trade war and relies on large economies, rich product-level price data or general-equilibrium simulation (Cavallo et al., 2021; Li et al., 2020; Ossa & Redding, 2026). Work on the 2025 announcement has mostly looked at financial-market reactions (Kapar et al., 2025). Evidence on how tariffs transmit to the export performance of a small, garment-dependent third country such as Bangladesh, and how this interacts with exchange-rate, remittance and reserve conditions, remains scarce. Time-series evidence is especially limited, and the studies that exist rarely confront short samples and non-stationarity openly.

2.4 Research Objectives and Questions

The general objective is to examine the association between US tariffs and Bangladesh's exports to the United States using a time-series OLS framework. The specific objectives are to (i) estimate the association between changes in the US tariff on Bangladeshi goods and changes in exports; (ii) assess whether the tariff faced by a key competitor, Vietnam, shifts Bangladesh's exports; (iii) assess the exchange rate as a channel of price competitiveness; (iv) evaluate whether remittances and reserves act as macro-financial buffers; and (v) control for domestic inflation and global energy prices.

The research questions are: (1) Is a higher US tariff on Bangladeshi goods associated with lower exports to the United States? (2) Do competitor tariffs and exchange-rate, remittance, reserve, inflation and oil dynamics explain export changes beyond the tariff? (3) Are the available data sufficient to separate the tariff effect from other influences?

2.5 Contribution of the Study

The study makes three contributions. First, it provides an early empirical baseline for Bangladesh in the context of the 2025 US tariff regime, linking it to the evidence on tariff incidence and trade diversion. Second, it follows a disciplined sequence of unit-root testing, differencing, estimation and diagnostics, and reports non-significant findings transparently. Third, it identifies the data requirements that a credible causal assessment would need, which is useful guidance for researchers and agencies such as Bangladesh Bank.

2.6 Structure of the Article

Section 3 reviews the literature and develops the hypotheses. Section 4 describes the data and methodology. Section 5 presents the results. Section 6 discusses the findings, implications and limitations, and concludes.

3. Literature Review and Hypothesis Development

3.1 Previous Literature

The 2018–2019 US tariffs are the closest recent parallel. Amiti et al. (2019) found that those tariffs were passed almost fully into US import prices, so American buyers, not foreign sellers, carried most of the cost. Fajgelbaum et al. (2020) reached a similar conclusion on prices and also documented large drops in the import volumes of targeted goods. Cavallo et al. (2021) showed that pass-through was nearly complete at the border but that retailers absorbed a good part of it before it reached shelf prices. Flaaen and Pierce (2019) found that the tariffs hurt US manufacturers that rely on imported inputs, with a net negative effect on manufacturing. Fajgelbaum and Khandelwal (2022) summarize this body of work and point out that third countries can gain when tariffs fall on someone else, because buyers redirect their orders. Model-based work reaches a similar conclusion, with a sustained trade war permanently lowering income and trade volumes (Lindé & Pescatori, 2019). Evidence on Bangladesh itself is thinner, partly because the recent tariff changes are so new.

3.2 Theoretical Background

The textbook case is straightforward. A tariff is a tax on imports, so it raises the price that buyers in the importing country pay unless the exporter cuts its own price to compensate. A small exporter competing with many others for the same retail orders cannot cut much, so the tariff mostly raises the buyer's cost, and the buyer then has a reason to shift orders elsewhere. That shift is where the damage to the exporter appears. Trade costs more broadly, of which tariffs are one part, are large and shape bilateral trade patterns (Anderson & van Wincoop, 2004), and tariff reductions were a major driver of post-war trade growth (Baier & Bergstrand, 2001). How large the volume response is depends on how easily buyers can substitute between suppliers. In apparel, where sourcing is spread across many countries, substitution is plausibly easier than in sectors with specialized inputs.

Apparel buyers routinely compare Bangladesh with Vietnam, India, Cambodia and other suppliers on price, lead time and compliance. When a tariff change alters the relative landed

cost, orders can be reallocated at the margin. This is why the competitor's tariff belongs in the model alongside Bangladesh's own, and why a tariff change that affects every supplier equally should matter less than one that singles out a single country.

Beyond tariffs, the usual macroeconomic drivers of exports apply. A weaker domestic currency lowers the foreign-currency price of exports, although an apparel exporter that imports much of its fabric loses part of that gain through costlier inputs. Remittances bring in foreign currency, but sustained inflows can push up the real exchange rate and make export sectors less competitive (Amuedo-Dorantes & Pozo, 2004). Reserves matter because they let a central bank keep import channels open for intermediate goods when dollars are scarce. Inflation raises production costs at home. Oil prices work through energy and shipping costs, yet they are also tied to the US business cycle (Hamilton, 1983), so their sign in an export equation is not obvious.

3.3 Research Gap

The studies above establish that tariffs raise buyer prices and redirect trade, but they lean on product-level or monthly data from large economies. Two things are missing for a country like Bangladesh. One is a long annual series that includes both the long period of stable tariffs and the 2025 episode. The other is an explicit role for the tariff facing a competitor, since a rise in the tariff on Bangladesh means something different when a rival's tariff rises by the same amount. A further concern is statistical. Regressions on trending series can produce impressive fits that mean nothing, so any model built on these data has to deal with non-stationarity first.

3.4 Hypothesis Development

The reasoning above gives seven testable statements. They are framed in terms of the changes in exports that the model actually explains. H1 and H2 concern the policy variables and are the core of the study. H3 to H7 concern the controls and are included so that the tariff estimates are not distorted by omitted variables.

H1. Increases in the US tariff on Bangladeshi goods are associated with lower growth in Bangladesh's exports to the United States. A higher tariff raises the buyer's cost and gives buyers a reason to move orders.

H2. Higher US tariffs on Vietnam are associated with higher Bangladeshi exports. When a close rival becomes more expensive, some orders should be diverted.

H3. A faster depreciation of the taka is associated with higher exports, because it lowers the dollar price of Bangladeshi goods.

H4. Remittance inflows are significantly associated with exports. The sign could go either way, since remittances finance imports of inputs but can also appreciate the real exchange rate.

H5. Larger foreign exchange reserves are associated with higher exports, because they ease access to imported inputs.

H6. Higher domestic inflation is associated with lower exports through higher production costs.

H7. Changes in the oil price are significantly associated with changes in exports. The sign is left open because oil prices reflect both costs and global demand.

4. Data and Methodology

4.1 Data and Sample

The sample is annual and runs from 2001 to 2025, which gives 25 observations. It ends in 2025 so that it includes the first year of the new US tariff regime. Exports to the United States, in millions of US dollars, come from the World Bank's WITS database (World Bank, n.d.-c), since the World Development Indicators do not publish bilateral exports by partner. The average effective US tariff rates on imports from Bangladesh and from Vietnam come from USAFacts, which draws on US Census data (USAFacts, n.d.). For 2001 to 2022 these rates are approximations based on multi-year averages, while the figures for 2023 to 2025 are exact annual values. The exchange rate, which is the official period average in taka per US dollar, personal remittances received, total reserves including gold and consumer price inflation come from the World Development Indicators (World Bank, n.d.-b). The oil price, in dollars per barrel, is the annual average Brent crude price from the World Bank Commodity Price Data, known as the Pink Sheet (World Bank, n.d.-a).

Several sources were used to cross-check the main series. Bangladesh Bank (n.d.) publishes exchange rate, remittance and reserve series, and the Federal Reserve Bank of St. Louis FRED site (Federal Reserve Bank of St. Louis, n.d.) mirrors the inflation and Brent series. The US Energy Information Administration spot prices (U.S. Energy Information Administration, n.d.) were compared with the Brent figures. The Office of the United States Trade Representative publishes the statutory reciprocal tariff rate for Bangladesh from 2025 onward (Office of the United States Trade Representative, 2026b), and the USITC DataWeb holds the raw tariff and trade data by product (U.S. International Trade Commission, n.d.). Both were consulted to verify the timing and size of the tariff changes.

4.2 Variables

The dependent variable is Bangladesh's exports to the United States. The explanatory variables are the US tariff on Bangladeshi goods, the US tariff on Vietnamese goods, the exchange rate, remittances, reserves, Bangladeshi inflation and the oil price. Table 3 later shows which of them enter the model in levels and which in differences. Exports are measured in millions of US dollars. Tariffs are percentages, so a change in them is a change in percentage points. The exchange rate is expressed as taka per dollar, which means a rise is a depreciation. Remittances and reserves are in current US dollars, inflation is the annual percentage change in consumer prices, and the oil price is in dollars per barrel.

4.3 Model Specification

Let EXP denote exports, TBD and TVN the tariffs on Bangladesh and Vietnam, FX the exchange rate, REM remittances, RES reserves, INF inflation and OIL the oil price. The estimated equation is:

$$\Delta EXP_t = \beta_0 + \beta_1 \Delta TBD_t + \beta_2 TVN_t + \beta_3 \Delta^2 FX_t + \beta_4 \Delta^2 REM_t + \beta_5 \Delta RES_t + \beta_6 INF_t + \beta_7 \Delta OIL_t + \varepsilon_t$$

Here Δ is the first difference, Δ^2 the second difference and ε the error term. The transformations follow directly from the unit root tests in Section 5.2.

4.4 Econometric Method

Each series was first examined with a Dickey–Fuller test (Dickey & Fuller, 1979) run under Stata's default settings, which use no augmentation lags, and judged against the 5 percent critical value of -3.000 . A series with a unit root was differenced repeatedly until the test rejected non-stationarity. Differencing was preferred to fitting a time trend because it keeps the regression in terms of changes, which is what a policy shock would alter, and because it avoids the spurious regression problem (Granger & Newbold, 1974). The tariff on Vietnam and inflation were stationary in levels and were left as they are. Because the exchange rate and remittances needed two rounds of differencing, the regression starts in 2003 and uses 23 observations. The equation was estimated by ordinary least squares (Wooldridge, 2020) in Stata 18 (StataCorp, 2023). The fitted model was then checked in three ways. The Breusch–Pagan test (Breusch & Pagan, 1979) looked for non-constant error variance, variance inflation factors looked for overlap among the regressors, and the Durbin–Watson statistic (Durbin & Watson, 1950) looked for first-order autocorrelation in the residuals. As a robustness check, the model was estimated again with heteroskedasticity-robust standard errors.

5. Results and Empirical Findings

5.1 Descriptive Statistics

Table 1 summarizes the data. Exports to the United States averaged 1,158 million dollars a year, with a low of 226 million in 2003 and a high of 2,945 million in 2022. The tariff on Bangladeshi goods is almost a constant. It sits at 15 percent in every year up to 2022, edges to 15.7 and 15.1 percent in 2023 and 2024, and jumps to 23.3 percent in 2025. The Vietnamese tariff is similarly flat at 7.6 percent until it falls to 3.8 percent in 2024 and rises to 8.7 percent in 2025. The other series trend strongly: the taka runs from 55.8 to 121.9 per dollar, remittances from 2.1 to 33.9 billion dollars, and reserves from 1.3 to 46.2 billion.

Table 1
Descriptive Statistics, 2001–2025

Variable	Obs.	Mean	SD	Min	Max
Exports to US (US\$ million)	25	1,158.35	877.82	225.90	2,944.90
US tariff on Bangladesh (%)	25	15.36	1.66	15.00	23.30
US tariff on Vietnam (%)	25	7.49	0.80	3.80	8.70
Exchange rate (BDT per US\$)	25	78.51	16.78	55.80	121.90

Variable	Obs.	Mean	SD	Min	Max
Remittances (US\$ billion)	25	13.55	8.19	2.10	33.88
Forex reserves (US\$ billion)	25	18.53	14.02	1.31	46.17
Inflation (%)	25	6.91	2.13	2.01	11.40
Oil price (US\$ per barrel)	25	68.37	26.60	24.44	111.67

5.2 Correlation and Preliminary Analysis

The correlations in Table 2 are measured on the original levels. Exports move closely with remittances, the exchange rate and reserves, while the correlation with the US tariff on Bangladesh is a modest 0.318 and with the Vietnamese tariff slightly negative at -0.170 . The exchange rate and remittances are almost collinear. These figures should be read with caution, because series that all trend upward over 25 years will correlate whether or not one affects the other.

Table 2
Correlation Matrix (Levels)

Variable	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) Exports to US	1.000							
(2) US tariff on Bangladesh	0.318	1.000						
(3) US tariff on Vietnam	-0.170	0.306	1.000					
(4) Exchange rate	0.821	0.574	-0.289	1.000				
(5) Remittances	0.873	0.540	-0.195	0.955	1.000			
(6) Forex reserves	0.813	0.154	0.001	0.616	0.767	1.000		
(7) Inflation	0.250	0.211	-0.281	0.478	0.376	-0.046	1.000	
(8) Oil price	0.279	0.017	-0.089	0.390	0.383	0.125	0.650	1.000

Note. Here, $N = 25$.

Table 3 shows that exports, the tariff on Bangladesh, the exchange rate, remittances, reserves and the oil price all have unit roots in levels, with p-values from 0.156 to above 0.99. Exports, the Bangladeshi tariff and the oil price become stationary after one difference. Reserves cross the 5 percent line only just. The exchange rate and remittances remain non-stationary after one difference and only become stationary after a second. The Vietnamese tariff and inflation are stationary in levels. That is the reason the model mixes levels, first differences and second differences.

Table 3
Dickey–Fuller Unit Root Tests

Variable	Level (P value)	First difference (P value)	Second difference (P value)
Exports to US	0.8458	0.0000	–
US tariff on Bangladesh	0.9663	0.0000	–
US tariff on Vietnam	0.0000	–	–
Exchange rate	0.9988	0.1012	0.0000
Remittances	0.9985	0.5118	0.0015

Variable	Level (P value)	First difference (P value)	Second difference (P value)
Forex reserves	0.6918	0.0495	–
Inflation	0.0180	–	–
Oil price	0.1556	0.0003	–

Note. Cells show the MacKinnon (1996) approximate p-value. The 5% critical value is –3.000.

5.3 Main Empirical Results

Table 4 reports the regression. The model does little. The R^2 is 0.390, but with seven regressors and only 23 observations the adjusted R^2 falls to 0.105, and the F-test cannot reject the hypothesis that every slope is zero. The root mean squared error of 343.7 is only a little below the standard deviation of the dependent variable, which says that the regressors together explain a small share of the year-to-year change in exports.

Table 4

OLS Regression Results (Dependent Variable: Δ Exports to US, US\$ million)

Variable	Coef.	Std. errs.	t	p	95% conf. interval
Δ US tariff on Bangladesh (%)	27.493	57.868	0.48	0.642	[–95.850, 150.837]
US tariff on Vietnam (%)	–3.272	148.668	–0.02	0.983	[–320.152, 313.607]
Δ^2 Exchange rate (BDT per US\$)	–18.823	26.283	–0.72	0.485	[–74.845, 37.199]
Δ^2 Remittances (US\$)	5.95e–09	6.22e–08	0.10	0.925	[–1.27e–07, 1.39e–07]
Δ Forex reserves (US\$)	–8.73e–09	2.20e–08	–0.40	0.697	[–5.55e–08, 3.81e–08]
Inflation (%)	–52.811	55.667	–0.95	0.358	[–171.462, 65.841]
Δ Oil price (US\$ per barrel)	11.224**	4.143	2.71	0.016	[2.392, 20.055]
Constant	481.866	1,261.393	0.38	0.708	[–2,206.729, 3,170.461]

Note. N = 23. R^2 = 0.390; adjusted R^2 = 0.105; F (7, 15) = 1.37, p = 0.287; root MSE = 343.7. ** p < .05.

The tariff coefficients are the focus of the study and the least informative. A one-point rise in the annual change in the US tariff on Bangladesh goods goes with a 27.5 million dollar rise in the change in exports, which carries the opposite sign to H1. The 95 percent confidence interval runs from –95.8 to 150.8, so the data are compatible with a sizeable fall, a sizeable rise or no effect at all. The coefficient on the Vietnamese tariff is –3.3 with an even wider interval. H1 and H2 are therefore not supported.

Among the controls, only the oil price stands out. A one-dollar increase in the annual change in the oil price goes with an 11.2 million dollar increase in the change in exports, which supports H7. The exchange rate, remittances, reserves and inflation are all insignificant at conventional levels, so H3, H5 and H6 are not supported and there is no evidence for H4. The remittance and reserve coefficients look like zeros only because those variables are measured in single dollars. Per extra billion dollars they amount to about 6.0 million and –8.7 million dollars, each with a standard error larger than the estimate.

5.4 Robustness and Additional Analysis

The diagnostics show no cause for concern. Constant variance is not rejected by the Breusch–Pagan test. Variance inflation factors average 2.04 with a maximum of 2.87, well under the

common threshold of 10 (Wooldridge, 2020), so differencing has removed the strong overlap seen earlier between remittances and the exchange rate. A Durbin–Watson value of 2.22 indicates no first-order serial correlation. Estimating the model again with heteroskedasticity-robust standard errors leaves the conclusions unchanged: the oil price remains significant, the Bangladeshi tariff stays insignificant and no other variable comes close to the 10 percent level.

5.5 Other Findings

The weak tariff result has a plain explanation in the data. After differencing, the Bangladeshi tariff changes in only three years. The slope on that variable is effectively identified from three observations. The raw numbers are also instructive. In 2025, when the effective tariff rose by 8.2 points, recorded exports still grew by 122 million dollars, about 5.4 percent. In 2023, when the tariff moved by only 0.7 points, exports fell by 695 million dollars, or 23.6 percent. Large swings in exports evidently happened without large tariff changes, which points to forces outside the tariff schedule.

6. Discussion and Conclusion

6.1 Summary of Main Findings

The model does not explain much. Changes in the US tariff on Bangladeshi goods and on Vietnamese goods are not statistically related to changes in Bangladesh's exports to the United States, and neither are the exchange rate, remittances, reserves or inflation once the series are made stationary. Only the oil price shows a significant positive link. The diagnostics are clean, so the weak fit is not caused by an obvious violation of the OLS assumptions.

6.2 Theoretical and Practical Implications

The results neither confirm nor refute the standard view that tariffs reduce exports. They show that annual aggregate data, with a tariff series that stayed almost flat for two decades, cannot test it well. For policymakers the practical lesson is to avoid reading the null result as reassurance. A tariff of 19 or 20 percent may still hurt, and the data simply lack the variation to show it. The oil result is a reminder that global conditions can move Bangladesh's exports in the same year as a tariff change, which complicates any attempt to credit or blame one policy.

6.3 Limitations

Several limits apply. The sample has only 23 usable observations, so the test has little power. The tariff rates for 2001 to 2022 are approximations and the series is nearly constant. The tariff is an average effective rate, not the statutory rate announced in 2025, and it covers all goods rather than apparel. The WITS export series records lower values than some US-side import statistics, so the levels should be treated with care, and the analysis relies on changes. The model mixes levels, first differences and second differences, which complicates interpretation, and no cointegration test was run. Finally, the 2025 shock is only partly captured in an annual figure, since orders placed before the announcements were still being shipped.

6.4 Future Research

The most useful next step is higher-frequency data. Monthly export values, with the announcement and effective dates of each tariff change coded as events, would give far more variation. Product-level data would allow a comparison between apparel and non-apparel exports, and between Bangladesh and competing suppliers, using a difference-in-differences design.

6.5 Conclusion

This study set out to see whether the US tariff on Bangladeshi goods helps explain Bangladesh's exports to the United States. On annual data for 2001–2025 it does not, but the data could hardly be expected to answer the question, because the tariff barely moved until the last three years. What the exercise does show is how much a careful treatment of trends changes the picture: strong level correlations disappeared once the series were differenced. The tariff story for Bangladesh will be easier to judge once more months of post-2025 data are available.

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