



TRADE VULNERABILITY OF BANGLADESH: AN EXPLORATORY ANALYSIS

**Presented at
Regional Conference on External Vulnerabilities in South Asia 2019**

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Colombo: 28 February 2019

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- Sources of trade vulnerability for Bangladesh
- Research questions

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- Statistical tests
- Non-parametric local linear kernel regression
- Principal components analysis

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- Statistical tests
- Bivariate non-parametric local linear kernel regression
- Principal components analysis
- Multivariate non-parametric local linear kernel regression

4. Conclusion

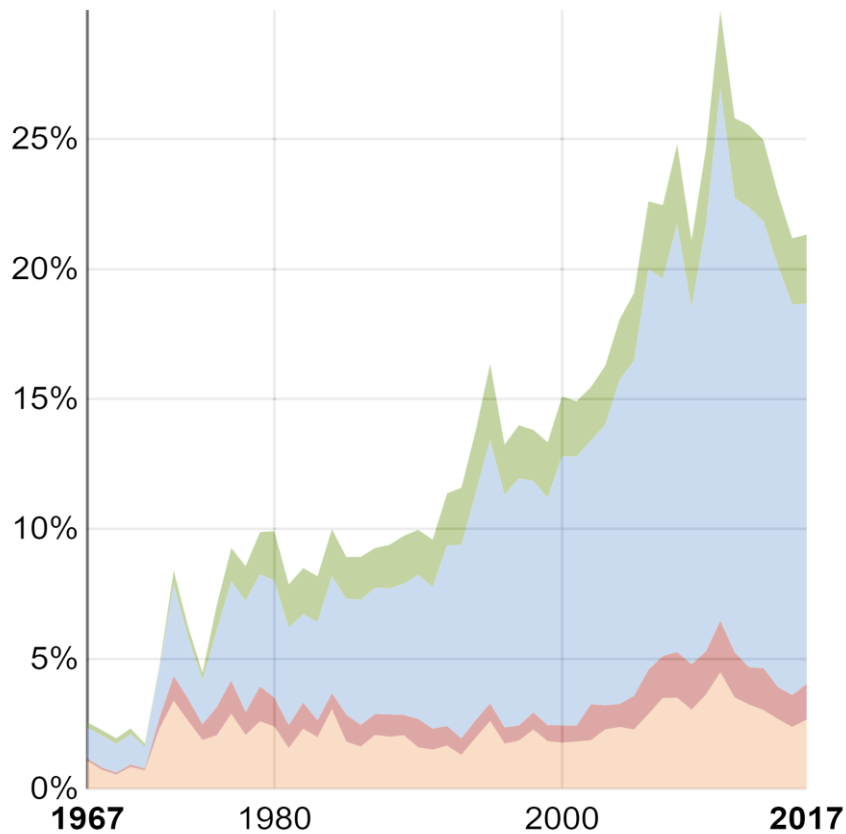
- Concluding remarks
- A ten point action plan for addressing trade vulnerability of Bangladesh

1. INTRODUCTION

Overview of Bangladesh's Trade

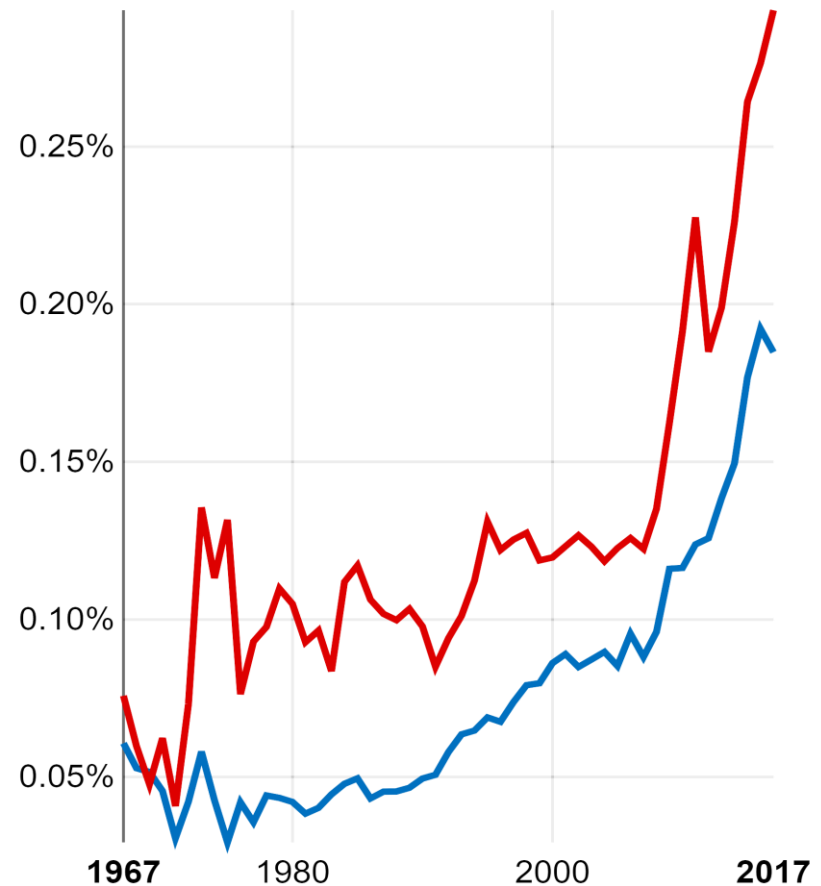
Trade Openness (% of GDP)

- Food, agriculture
- Mining-Energy-NES
- Manufacturing
- Services



Share in World Trade (%)

- Exports
- Imports

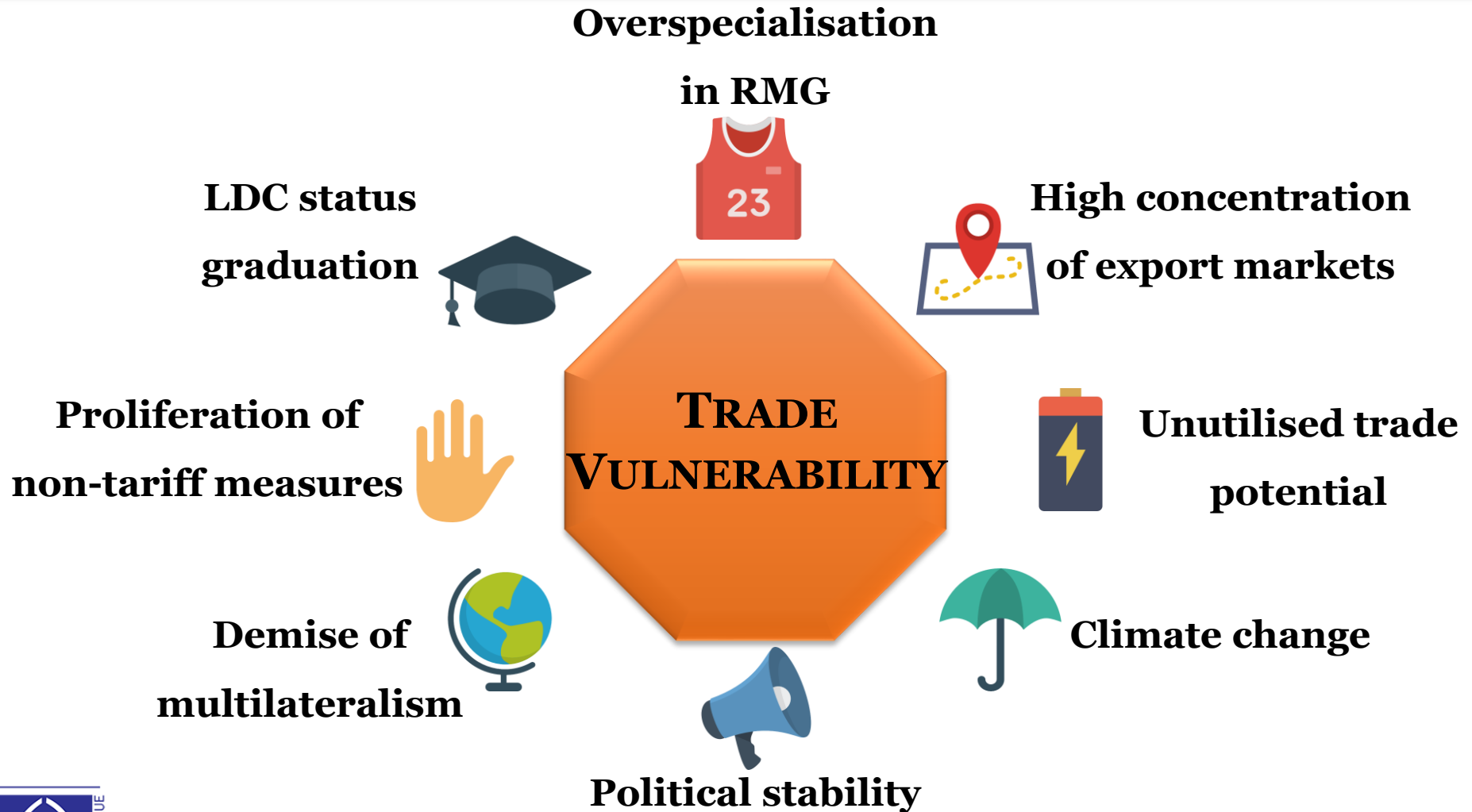


Source: CEPII CHELEM database country profiles. <http://visualdata.cepii.fr/panorama/en/?country=Bangladesh>

Trade Vulnerability of Bangladesh: An Exploratory Analysis

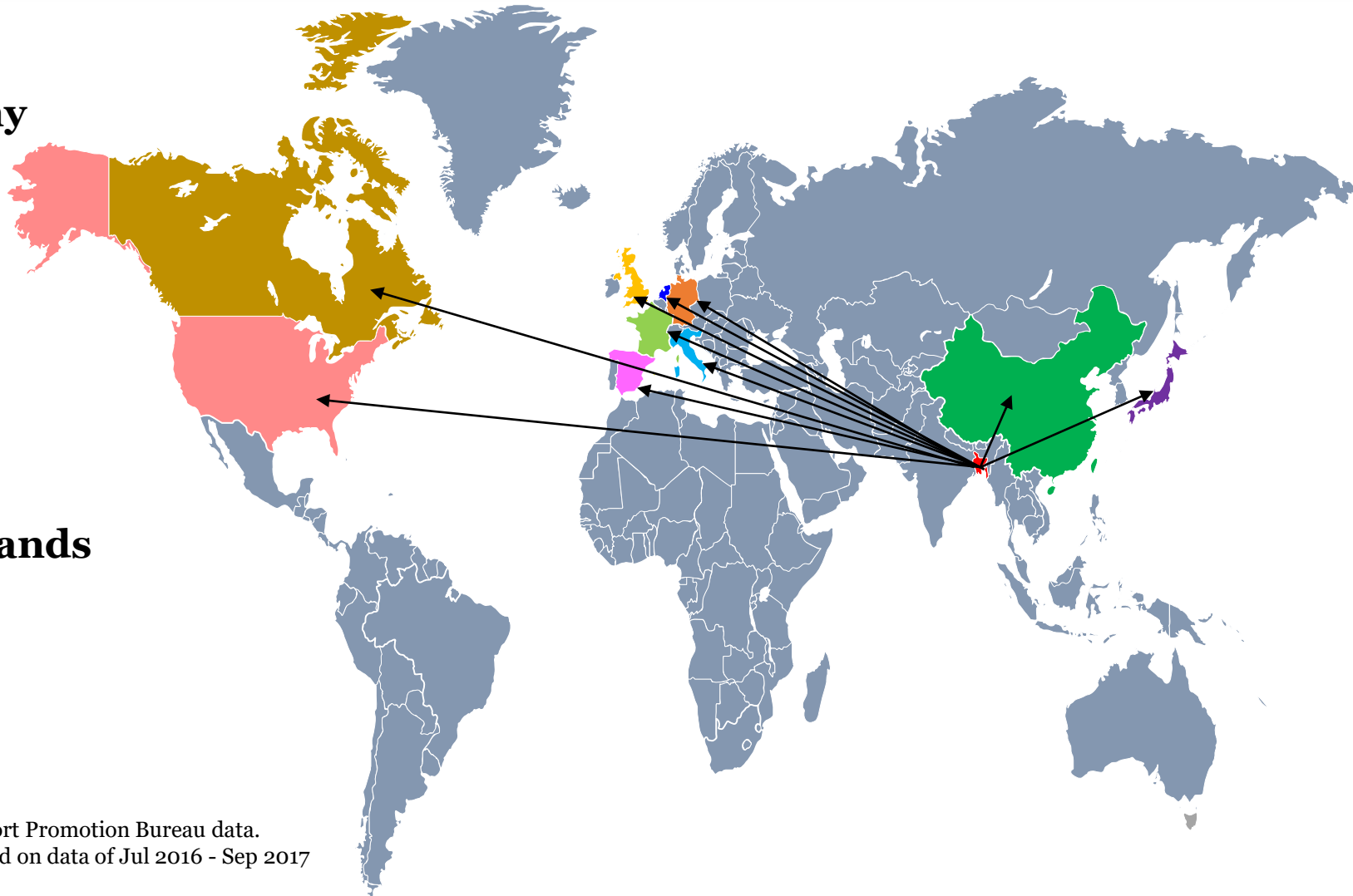
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Potential Sources of Trade Vulnerability for Bangladesh



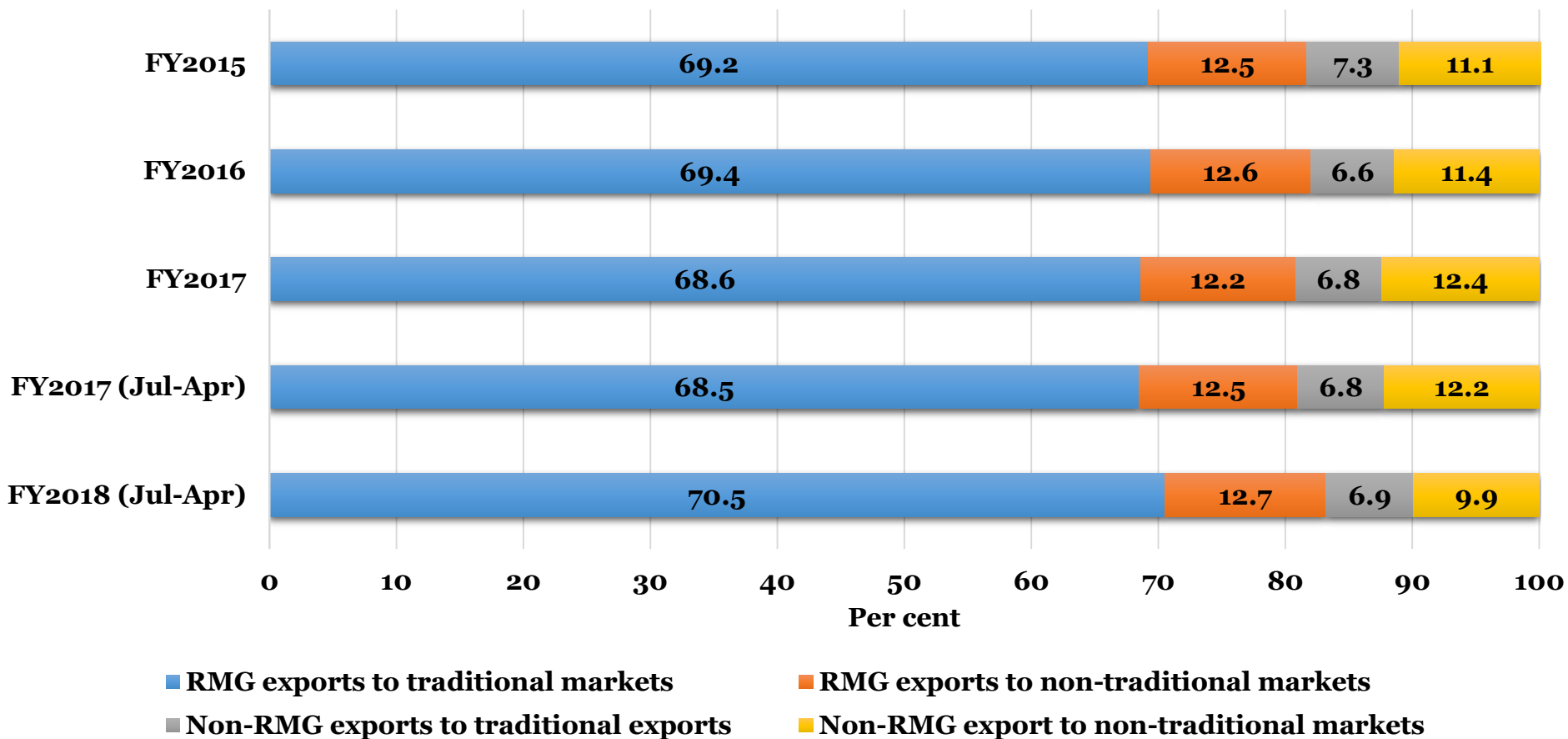
Bangladesh's Top Export Destinations

1. U.S.A
2. Germany
3. U.K
4. Spain
5. France
6. Italy
7. Canada
8. Netherlands
9. Japan
10. China



Source: Export Promotion Bureau data.
Note: Based on data of Jul 2016 - Sep 2017

Export Markets & Export Products Composition



Source: CPD Calculations from EPB data. (Adapted from CPD State of the Bangladesh Economy in FY2017-18 Third Reading)
 Note: Traditional market includes USA, EU and Canada.

Unutilised Trade Potential

JUTE:

Bangladesh is being unable to promote jute as an environment-friendly product

Environmental Impact

LEATHER:

Bangladesh is struggling to comply with environmental regulations in the leather industry

Some Trade Benefits That Will be Lost After LDC Graduation



**Everything
But Arms
Initiative**



**Least
Developed
Country
Tariff
(LDCT) GSP
programme**



**Expanded
Duty Free
Quota Free
(DFQF)
access**



**Support
measures in
the WTO for
LDCs**



**Duty-free
Tariff
Preference
Scheme
(DFTP)**

Research Questions



How do production and import prices affect trade volatility?

Can prudent macroeconomic policies reduce Bangladesh's trade vulnerability?

What are the trade related impacts of global warming and changes in political stability?

2. METHODOLOGY

Dependent Variables

Variable	Definition	Source
Goods trade balance	Balance of trade in goods in million USD	IMF Balance of Payments Statistics (BOPS)
Goods trade balance volatility	Predicted conditional variance of goods trade balance	Author's calculations based on IMF Balance of Payments Statistics (BOPS) data
Goods and services trade balance	Balance of trade in goods and services in million USD	IMF Balance of Payments Statistics (BOPS)
Goods and services trade balance volatility	Predicted conditional variance of goods and services trade balance	Author's calculations based on IMF Balance of Payments Statistics (BOPS) data
Current account balance	Current account balance (excluding reserves and related items) in million USD	IMF Balance of Payments Statistics (BOPS)
Current account balance volatility	Predicted conditional variance of current account balance	Author's calculations based on IMF Balance of Payments Statistics (BOPS) data

Independent Variables

Variable	Definition	Source
Minimum wage	Gross monthly minimum wage in BDT of garment workers. (Data before 2006 are estimates based on the 5 percent annual increment assumption)	Ministry of Labour and Employment, Government of Bangladesh
Manufacturing cost	Implicit GDP deflator for manufacturing (base year 2005-2006)	Bangladesh Bureau of Statistics
Utilities cost	Implicit GDP deflator for electricity, gas, and water (base year 2005-2006)	Bangladesh Bureau of Statistics
Cotton price	Annual real world price of cotton, A Index (USD per kilogram)	World Bank Commodity Price Data
Crude oil price	Annual real world price of crude oil (USD per barrel). (Average spot price of Brent, Dubai and West Texas Intermediate, equally weighed)	World Bank Commodity Price Data
Exchange rate	Taka per USD	Bangladesh Bureau of Statistics
Foreign exchange reserves	Foreign exchange reserves (end of period) in million USD	Accounts and Budgeting Department, Bangladesh Bank
Budget balance	Overall budget balance (excluding foreign grants) as a percentage of GDP	Ministry of Finance, Government of Bangladesh
Climate change	Annual average temperature change in degrees Celsius, with respect to a baseline period, 1951–1980	National Aeronautics and Space Administration Goddard Institute for Space Studies (NASA-GISS)
Political stability	Political stability index. Political Stability and Absence of Violence/Terrorism measures perceptions of the likelihood of political instability and/or politically-motivated violence, including terrorism. Estimate of governance (ranges from approximately -2.5 (weak) to 2.5 (strong) governance performance)	Worldwide Governance Indicators, World Bank

ARCH, GARCH & EGARCH Models

If a time series exhibits volatility clustering, then its variance may be modelled even if the series itself is a random walk.

Autoregressive Conditional Heteroskedasticity (ARCH)

simultaneously models the mean and variance of a time series based on the premise that the conditional variance of the error term depends on the past squared values of the error term

Generalised Autoregressive Conditional Heteroskedasticity (GARCH)

utilises lagged conditional variances in the current conditional variance equation

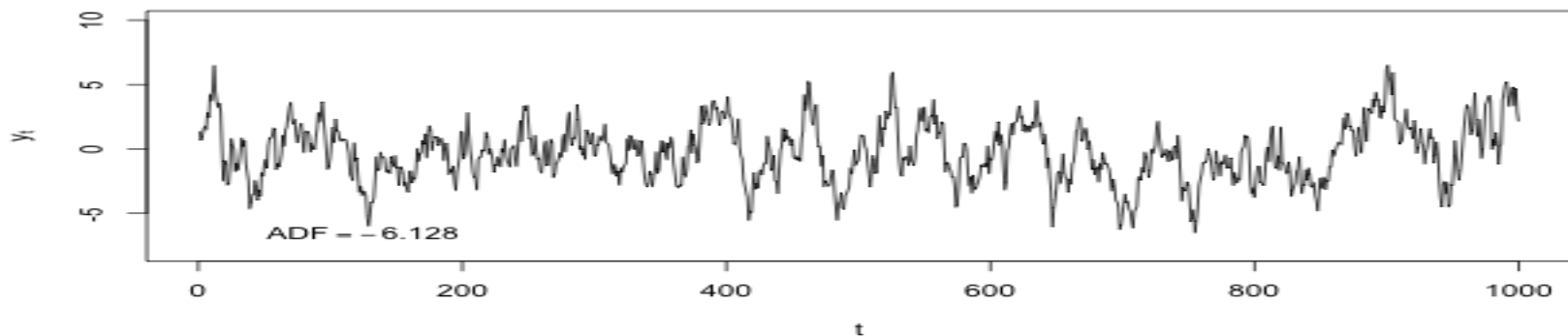
Exponential Generalised Autoregressive Conditional Heteroskedasticity (EGARCH)

makes provisions for asymmetric clustering volatility, and relaxes the restrictive assumptions pertaining to the estimated parameter coefficients

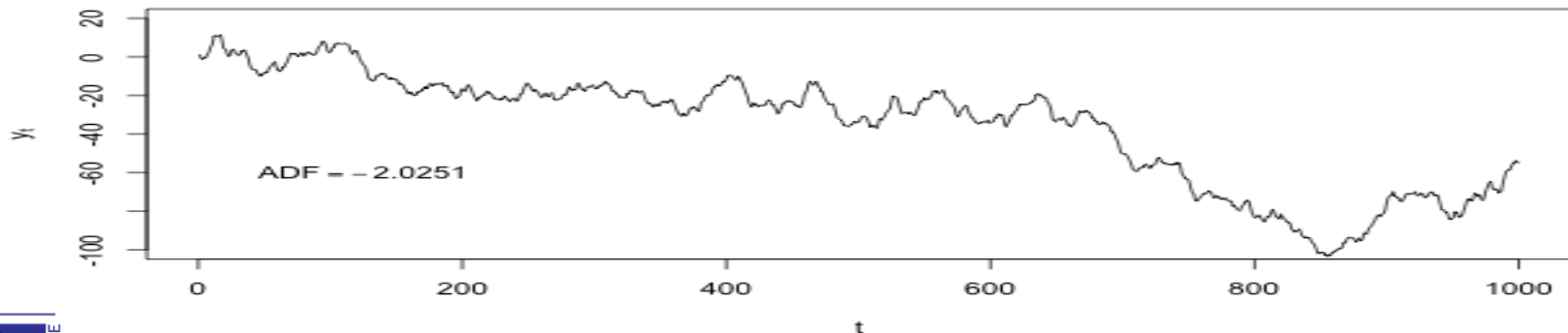
Unit root tests

- **Augmented Dickey-Fuller Unit Root Test**
- **Phillips-Perron Unit Root Test**

Stationary Time Series



Non-stationary Time Series



Cointegration test

Cointegration

- Degree to which two values are sensitive to the same mean over a given time period

Stationary pair

- Two time series are cointegrated if their linear combination is stationary

Direction unclear

- Cointegration does not indicate direction of relationship between two time series



“A drunk man goes on a random walk with his dog. The dog, being faithful, also goes on a random walk. The man and the dog are cointegrated. They can both go on random walks, but the maximum distance they can move away from each other is fixed by the length of the lead”.

Vector Error Correction Model

**Has
cointegrating
relations built
into the
specification**

**Deviation from
the long-run
equilibrium in
the previous lag
is corrected in
the next lag**

Vector

Error

Correction

Model

VECM

**Restricted
Vector
Autoregressive
(VAR) model**

**Restricts the long run
behavior of the
endogenous variables
to converge to their
cointegrating
relationships**

**Error correction
mechanism does
series of partial
short-run
adjustments.**

Granger Causality Test

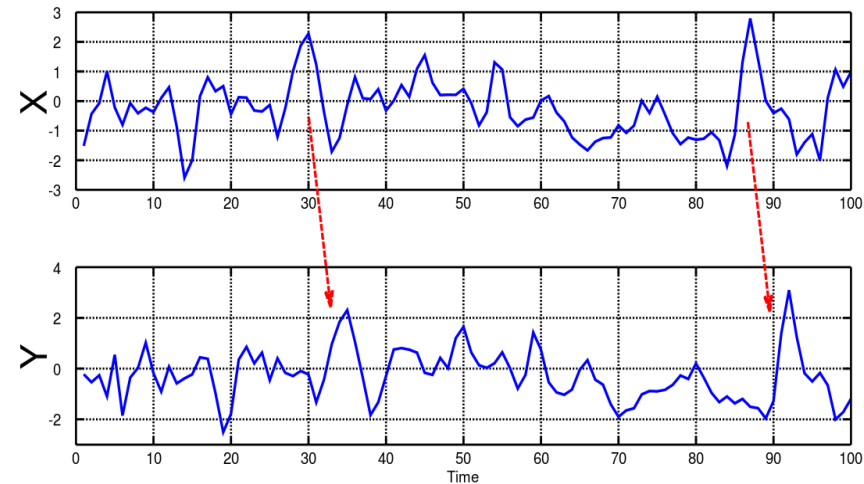
Ability of one time series to forecast another

Post hoc ergo propter hoc fallacy
"After this, therefore because of this" fallacy

Granger Causality Test

Predictive causality

If X G-causes Y, then past values of X provide information about future values of Y



Principal Components Analysis

- Each parameter which is estimated in a multiple regression model consumes one degree of freedom
- Including extraneous terms in an equation reduces the degrees of freedom available to estimate the variability of the parameters
- A set of composite indicators were created using principal components analysis
- Each composite indicator constituted of a number of highly correlated variables
- The number of parameters to be estimated could be reduced from ten to three
- Each indicator was defined as the predicted score of the first principal component

Production input prices indicator	Macroeconomic factors indicator	Unforeseen shocks indicator
Minimum wage	Exchange rate	Climate change
Manufacturing cost	Foreign exchange reserves	Political stability
Utilities cost	Budget balance	
Cotton price		
Crude oil price		

Non-Parametric Local-Linear Kernel Regression

- **Since the trade volatility of Bangladesh has been largely unexplored in the literature, it is not possible to determine the functional form of the equation that can specify its determinants.**
- **Thus, assuming arbitrary functional forms may lead to specification errors and biased estimation results.**
- **Non-parametric regression models are well suited for exploratory analysis since they do not make any assumptions regarding the functional form of the specification.**
- **This means that parameter estimates, along with bootstrap standard errors, can be obtained from a model without having knowledge of the underlying functional form of the equation.**

3. RESULTS

Ordinary Least Squares Estimation

Model Variables	Goods trade balance	Goods and services trade balance	Current account balance
One-period lagged goods trade balance	0.9372*** (0.0410)		
One-period lagged trade balance		0.9831*** (0.0320)	
One-period lagged current account balance			0.6832*** (0.0648)
Constant	-74.9673* (43.7725)	-54.2673 (48.2345)	-17.6523 (33.5219)
Probability > F	0.0000	0.0000	0.0000
R-squared	0.7582	0.8499	0.4023
Adjusted R-squared	0.7568	0.8490	0.3986
Root mean square error	394.34	446.01	433.19

Note: (i) Standard errors in parentheses; (ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; (iii) All values rounded up to fourth decimal place

ARCH LM Test

Chi square test statistic

Model Lags (p)	Goods trade balance	Goods and services trade balance	Current account balance
1	26.733***	45.631***	29.589***
2	28.543***	46.507***	29.929***
3	48.063***	58.498***	49.166***
4	63.607***	63.480***	61.121***

Note:

(i) Standard errors in parentheses; (ii) H_0 : no ARCH effects, H_1 : ARCH (p) disturbance

EGARCH Estimation

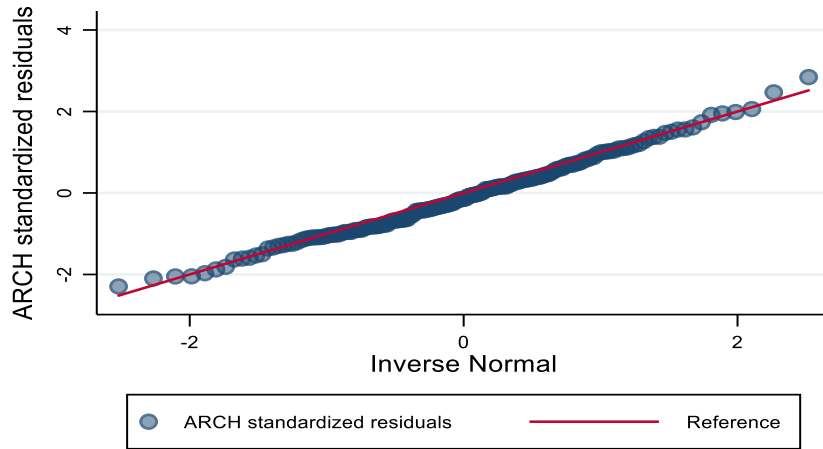
Model	Goods trade balance ⁽ⁱ⁾	Goods and services trade balance ⁽ⁱⁱ⁾	Current account balance ⁽ⁱⁱⁱ⁾
Variables	Mean equation		
Constant	-0.0001346 (4.822859)	-3.726732 (5.418941)	0.7815741 (2.328687)
Variables	Variance equation		
Constant	0.0580691 (0.2039171)	0.0701674 (0.2612633)	0.159266 (0.1847471)
AR (1)	-0.6574674*** (0.0820787)	-0.6209747*** (0.1024606)	-1.326943*** (0.0793671)
AR (2)	-0.9456522*** (0.1036093)	-0.9635732*** (0.0877235)	-1.397125*** (0.1156914)
AR (3)	-0.5846246*** (0.064163)	-0.5621059*** (0.0859197)	-1.085145*** (0.1273158)
AR (4)			-0.436982*** (0.1213994)
AR (5)			-0.1368233* (0.0741081)
MA (1)	0.0615956 (0.0868758)	0.0204271 (0.0853386)	
MA (2)	0.6241706*** (0.2085535)	0.6401196*** (0.1641928)	
EARCH (1)	0.1001695 (0.0802585)	0.0647787 (0.076638)	0.197888* (0.1016623)
EARCH_A (2)	0.5490861*** (0.1432853)	0.6197759*** (0.2346803)	0.3581394*** (0.0884509)
EGARCH (1)	0.9963338*** (0.0195099)	0.9952258*** (0.0248045)	0.9876259*** (0.0168373)
Log pseudolikelihood	-1123.284	-1143.128	-1134.511
Wald chi2	463.51	389.75	335.27
Probability > chi2	0.0000	0.0000	0.0000

Note:

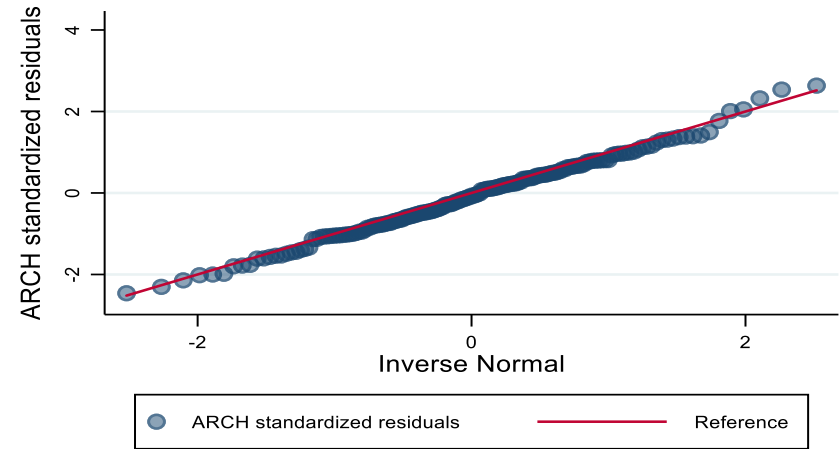
(i) ARIMA (3,1,2) model used; (ii) ARIMA (3,1,2) model used; ARIMA (5,2,0) model used; (iv) Semi-robust standard errors in parentheses ; (v) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; (vi) All values rounded up to fourth decimal place; (vii) Gaussian distribution assumed in all models

Q-Q Plot of Standardized Residuals

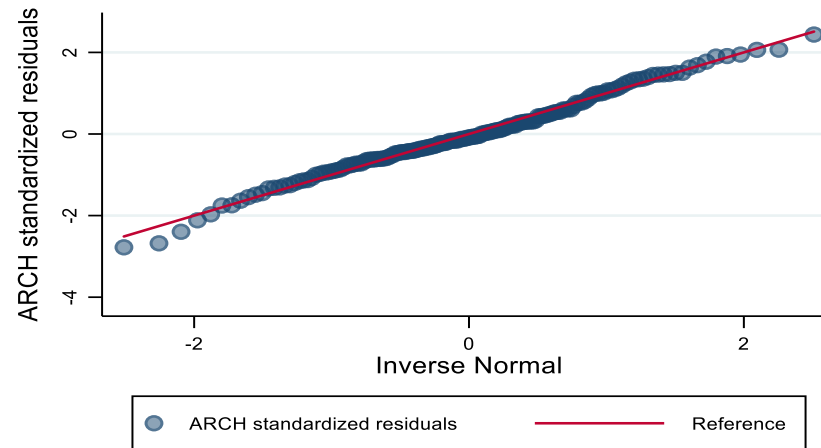
Goods trade balance model



Goods and services trade balance model



Current account balance model



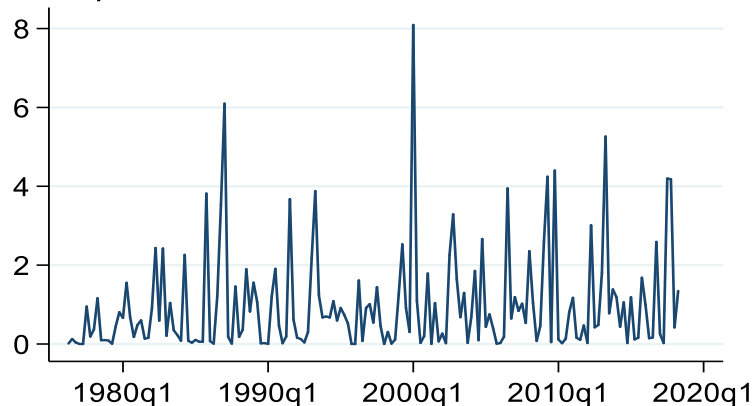
Kolmogorov-Smirnov Test

Model	Kolmogorov-Smirnov statistic	Probability
Goods trade balance	0.080	0.228
Goods and services trade balance	0.060	0.573
Current account balance	0.063	0.531

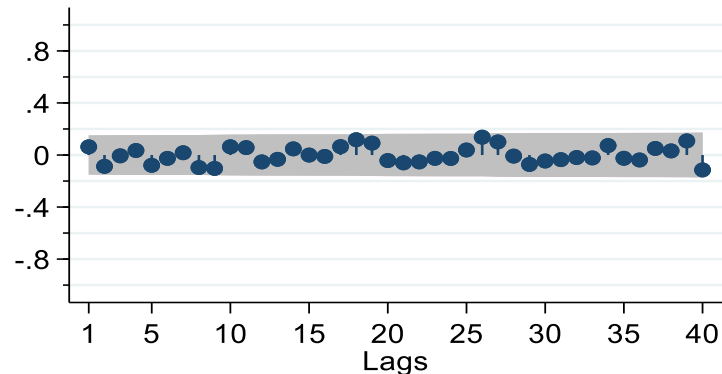
Note: (i) Null hypothesis: ARCH standardized residuals are normally distributed

Robustness of Residuals of Goods Trade Balance

Square of ARCH standardized residuals

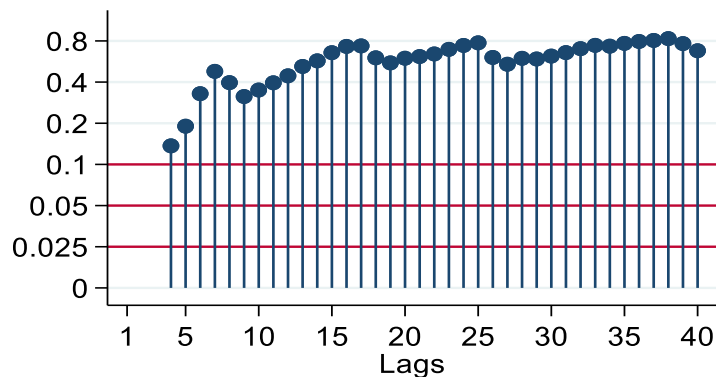


Autocorrelations



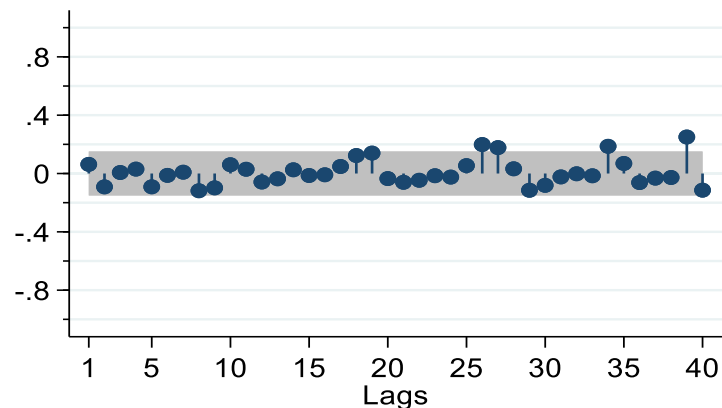
Note: Bartlett's formula for MA(q) 95% confidence bands

P-values for Q-statistics



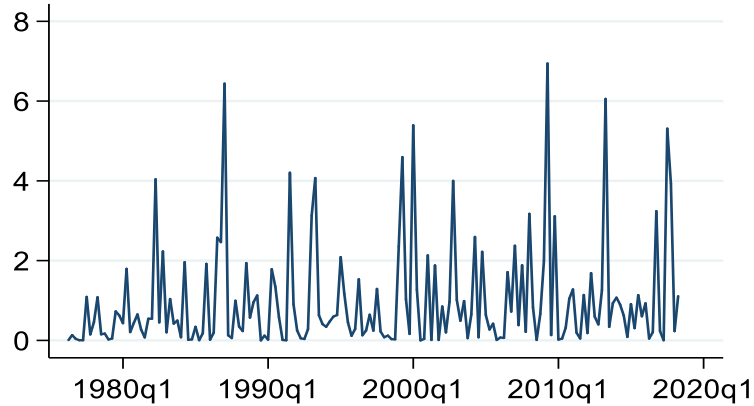
Note: Q-stat d.f. corrected for 3 ARCH parameters

Partial Autocorrelations

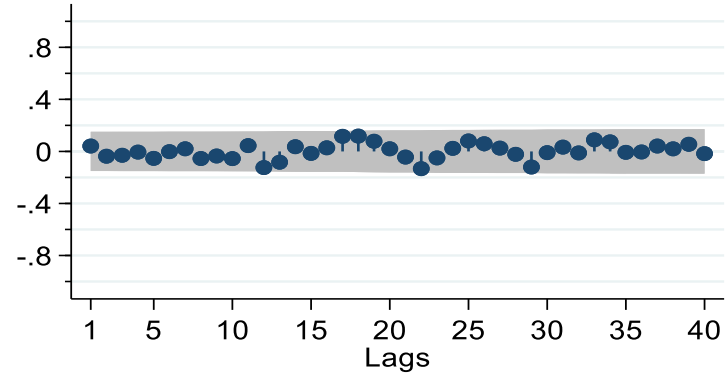


Robustness of Residuals of Goods & Services Trade Balance

Square of ARCH standardized residuals

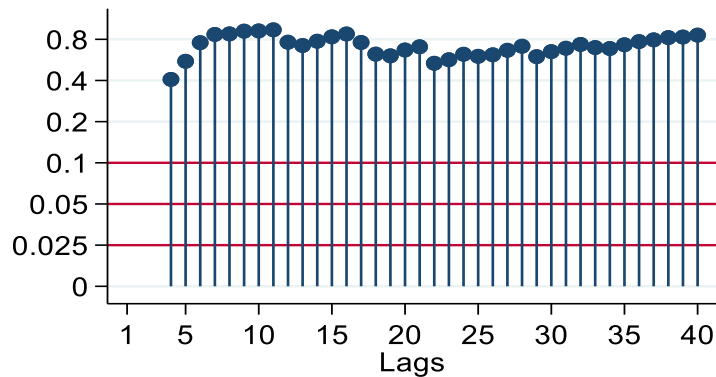


Autocorrelations



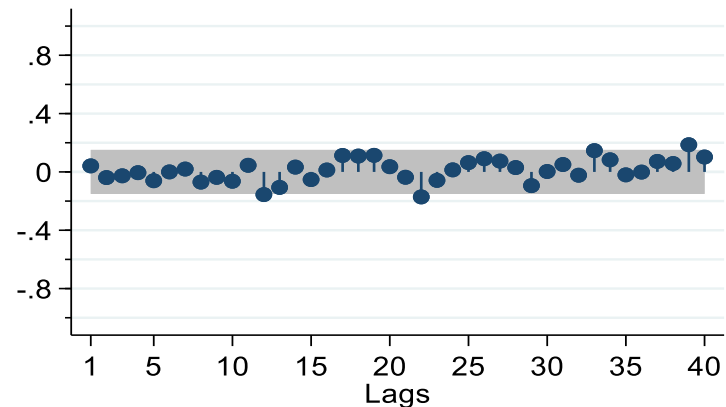
Note: Bartlett's formula for MA(q) 95% confidence bands

P-values for Q-statistics

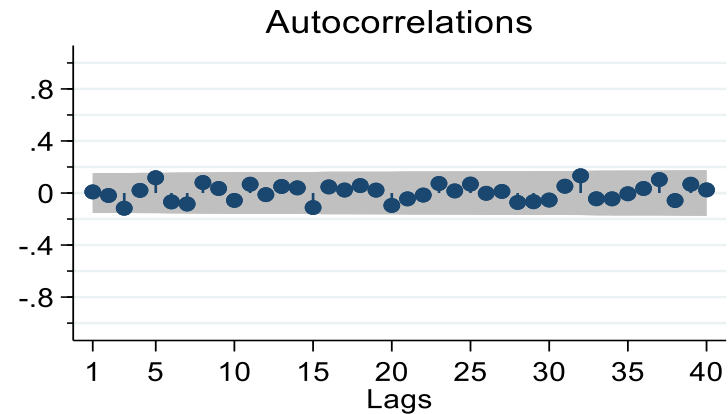
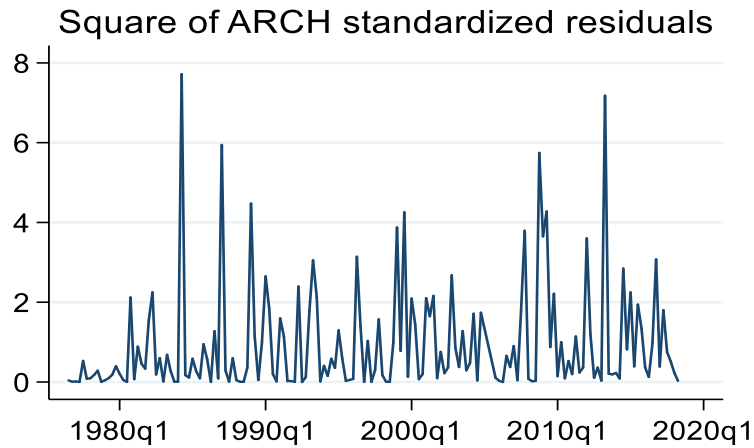


Note: Q-stat d.f. corrected for 3 ARCH parameters

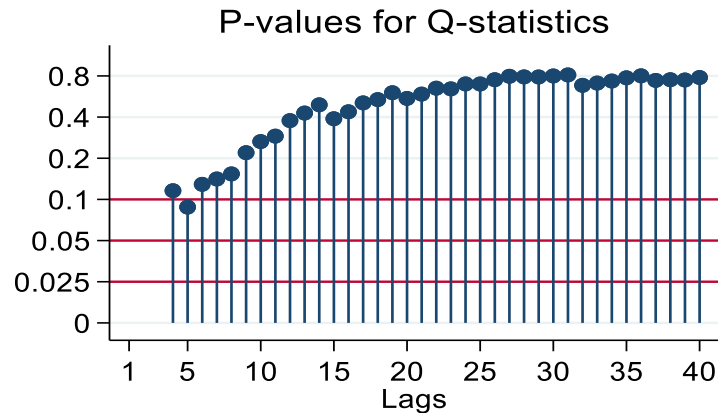
Partial Autocorrelations



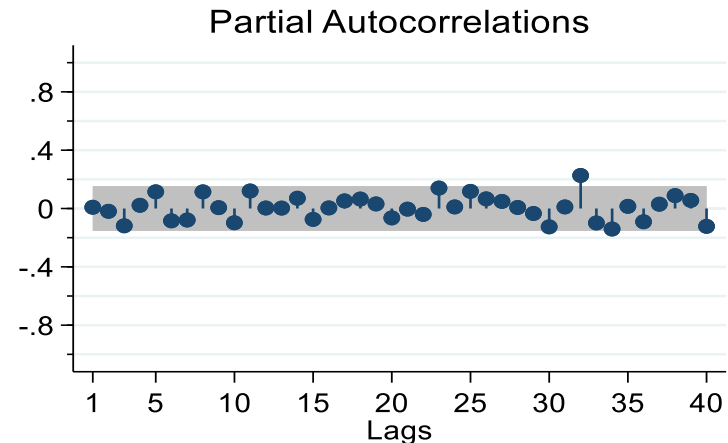
Robustness of Residuals of Current Account Balance



Note: Bartlett's formula for MA(q) 95% confidence bands

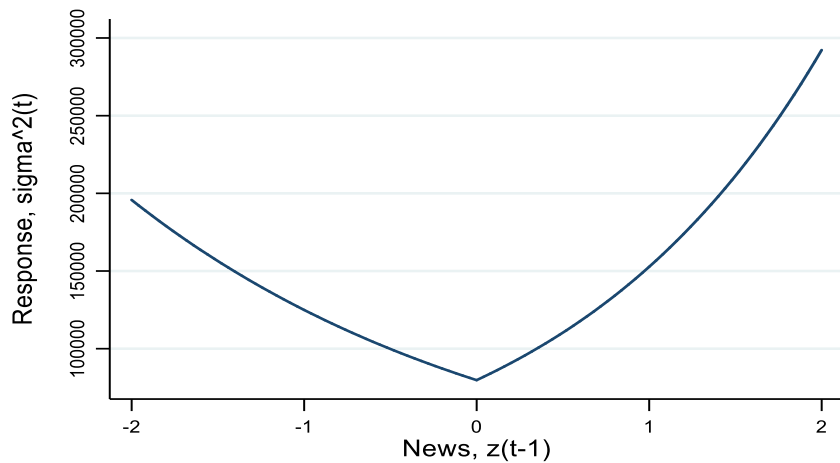


Note: Q-stat d.f. corrected for 3 ARCH parameters

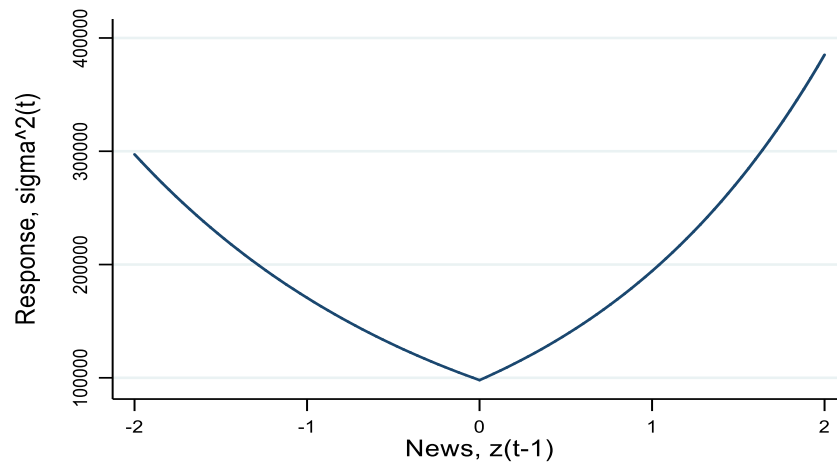


News Impact Curves

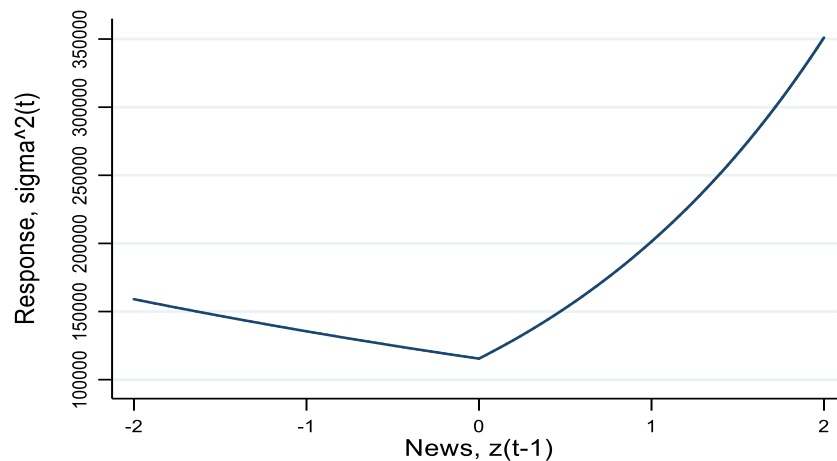
Goods trade balance model



Goods and services trade balance model



Current account balance model



Unit Root Tests

Variable	Augmented Dickey-Fuller Test			Phillips-Perron Test		
	T Statistic			Adjusted T Statistic		
	At level	At first difference	At second difference	At level	At first difference	At second difference
Goods trade balance	0.659348 (0.9875)	-4.623041 (0.0019)	-6.318163 (0.0001)	2.167342 (0.9998)	-1.798430 (0.3703)	-4.048277 (0.0064)
Goods trade balance volatility	4.878684 (1.0000)	-0.330426 (0.9010)	-8.115450 (0.0000)	-0.586491 (0.8538)	-4.285671 (0.0036)	-11.25847 (0.0000)
Goods and services trade balance	2.033595 (0.9997)	-5.397365 (0.0004)	-8.473257 (0.0000)	3.685604 (1.0000)	-3.039810 (0.0482)	-4.408122 (0.0030)
Goods and services trade balance volatility	3.820048 (1.0000)	-4.852392 (0.0012)	-6.818823 (0.0000)	0.133412 (0.9606)	-4.449195 (0.0025)	-8.812000 (0.0000)
Current account balance	-1.667863 (0.4305)	-0.098574 (0.9304)	-8.694935 (0.0003)	-1.538324 (0.4932)	-1.872845 (0.3359)	-4.515005 (0.0036)
Current account balance volatility	1.929322 (0.9995)	-1.208756 (0.6466)	-9.855854 (0.0000)	0.533083 (0.9837)	-5.628236 (0.0002)	-9.512183 (0.0000)
Minimum wage	0.582482 (0.9855)	-4.706320 (0.0015)	-7.194162 (0.0000)	0.924214 (0.9937)	-4.709180 (0.0015)	-14.14139 (0.0000)
Manufacturing cost	1.246225 (0.9972)	-1.771242 (0.3828)	-4.540864 (0.0023)	2.621095 (0.9999)	-1.598139 (0.4651)	-4.882716 (0.0011)
Utilities cost	0.284567 (0.9711)	-2.370775 (0.1617)	-5.612437 (0.0002)	1.147371 (0.9965)	-2.370775 (0.1617)	-5.739962 (0.0002)
Cotton price	-2.803383 (0.0748)	-4.843437 (0.0011)	-6.266952 (0.0001)	-2.766644 (0.0801)	-6.067636 (0.0001)	-14.21776 (0.0000)
Crude oil price	-1.515415 (0.5064)	-4.239498 (0.0040)	-4.034762 (0.0087)	-1.515415 (0.5064)	-4.238946 (0.0040)	-14.65065 (0.0000)
Exchange rate	-2.917789 (0.0640)	-4.039803 (0.0065)	-6.107325 (0.0002)	-2.564509 (0.1157)	-3.182952 (0.0364)	-10.25278 (0.0000)
Foreign exchange reserves	3.688580 (1.0000)	0.914690 (0.9927)	-4.318191 (0.0047)	6.279405 (1.0000)	-1.992598 (0.2873)	-8.594199 (0.0000)
Budget balance	-2.592068 (0.1102)	-4.761989 (0.0013)	-6.906680 (0.0000)	-2.592068 (0.1102)	-4.805777 (0.0012)	-14.43788 (0.0000)
Climate change	-2.994665 (0.0518)	-5.648129 (0.0002)	-6.733454 (0.0000)	-2.918921 (0.0600)	-8.571307 (0.0000)	-17.12436 (0.0000)
Political stability	-1.793421 (0.3732)	-5.936676 (0.0001)	-4.688225 (0.0021)	-1.712348 (0.4109)	-5.936676 (0.0001)	-18.67607 (0.0000)

Notes:

(i) Considering constant in test equation; (ii) Optimal lag selection based on the Schwarz Information Criterion (SIC); (iii) Probability values in parentheses; (iv) H_0 : a unit root exists; (v) Standardised values of all variables are used

ARDL Bounds Test

Dependent variable	F Statistic	Significance level	Bound critical values	
			I (0)	I (1)
Goods trade balance	27.39986***	10%	1.95	3.06
		5%	2.22	3.39
		2.5%	2.48	3.7
		1%	2.79	4.1
Goods trade balance volatility	7.476571***	10%	1.95	3.06
		5%	2.22	3.39
		2.5%	2.48	3.7
		1%	2.79	4.1
Goods and services trade balance	50.30872***	10%	1.95	3.06
		5%	2.22	3.39
		2.5%	2.48	3.7
		1%	2.79	4.1
Goods and services trade balance volatility	8.528004***	10%	1.95	3.06
		5%	2.22	3.39
		2.5%	2.48	3.7
		1%	2.79	4.1
Current account balance	3.257142**	10%	1.66	2.79
		5%	1.91	3.11
		2.5%	2.15	3.4
		1%	2.45	3.79
Current account balance volatility	3.319741**	10%	1.66	2.79
		5%	1.91	3.11
		2.5%	2.15	3.4
		1%	2.45	3.79

Note:

(i) Trend specification: constant (level); (ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; (iii) Automatic lag length selection based on Akaike information criterion (AIC); (iv) H_0 : no long-run relationships exist (v) Standardised values of all variables are used

VECM Causality Test

Null Hypothesis	Chi Square Statistic	Probability
Minimum wage Granger causes goods trade balance volatility	8.783012	0.0124
Minimum wage Granger causes current account balance volatility	32.65983	0.0000
Manufacturing cost Granger causes goods trade balance volatility	6.541673	0.0380
Utilities cost Granger causes goods trade balance volatility	11.23977	0.0036
Utilities cost Granger causes current account balance volatility	25.19868	0.0000
Cotton price Granger causes goods trade balance volatility	13.43496	0.0012
Cotton price Granger causes goods and services trade balance volatility	7.639014	0.0219
Crude oil price Granger causes goods and services trade balance volatility	8.118381	0.0173
Crude oil price Granger causes current account balance volatility	8.812202	0.0122
Exchange rate Granger causes goods trade balance volatility	6.028624	0.0491
Exchange rate Granger causes current account balance volatility	15.06934	0.0005
Foreign exchange reserves Granger causes goods trade balance volatility	14.24679	0.0008
Foreign exchange reserves Granger causes goods and services trade balance volatility	15.38978	0.0005
Foreign exchange reserves Granger causes current account balance volatility	10.58635	0.0050
Political stability Granger causes current account balance volatility	6.681125	0.0354

Note:

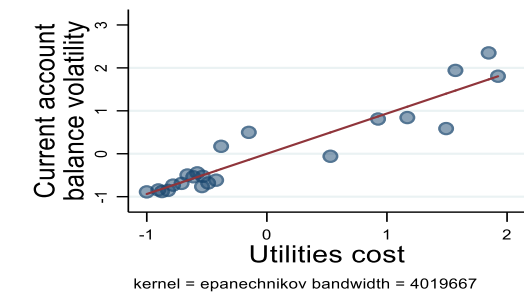
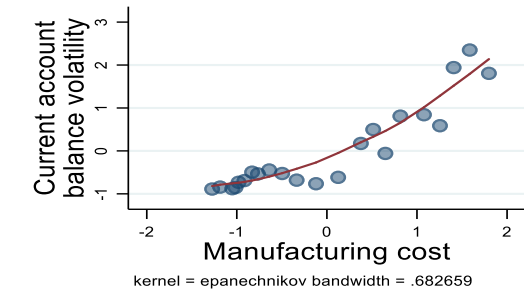
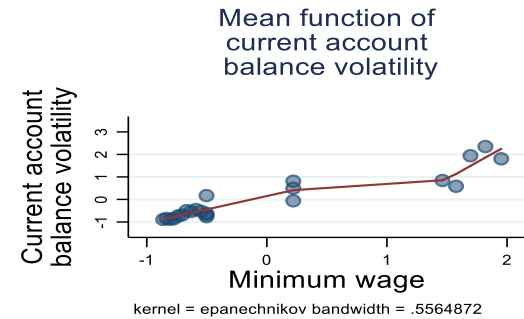
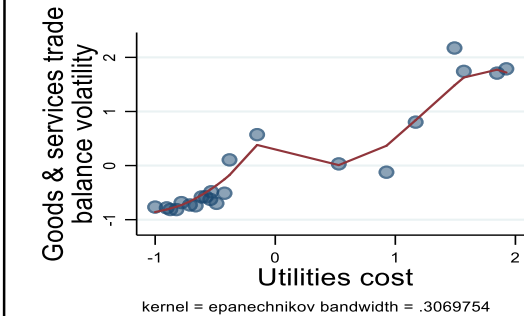
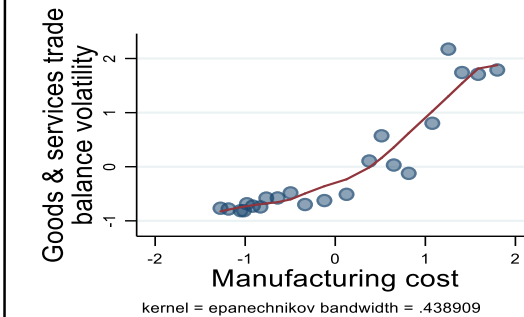
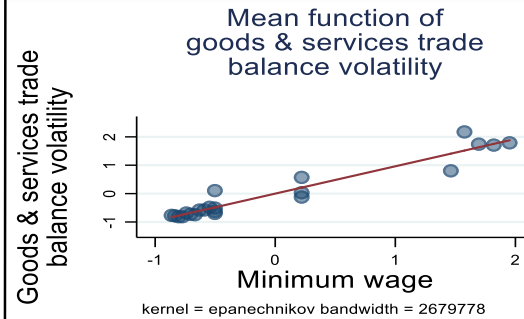
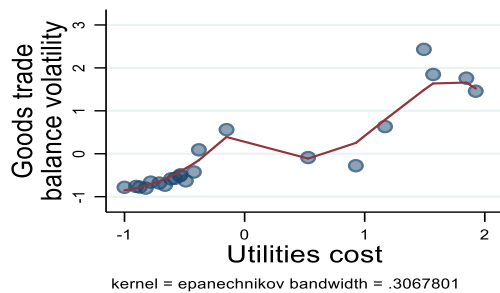
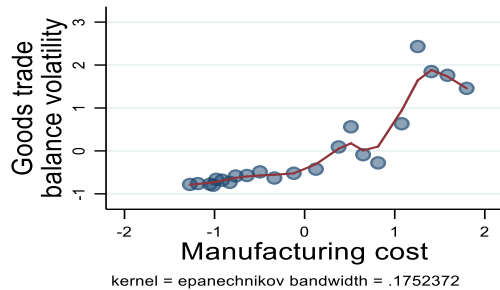
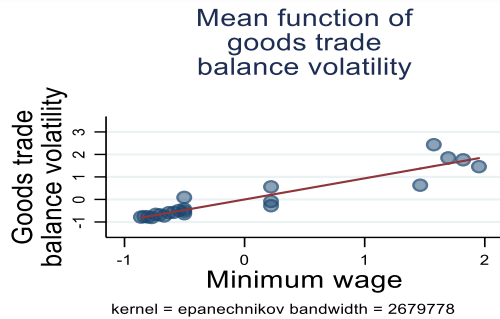
(i) Only statistically significant results are displayed; (ii) Standardised values of all variables are used; (iii) Probability values shown up to fourth decimal place

Granger Causality Test

Null Hypothesis	F Statistic	Probability
Minimum wage does not Granger cause goods and services trade balance volatility	8.18109	0.0040
Minimum wage does not Granger cause current account balance volatility	13.3727	0.0005
Manufacturing cost does not Granger cause goods trade balance volatility	5.78659	0.0137
Manufacturing cost does not Granger cause goods and services trade balance volatility	5.89006	0.0129
Manufacturing cost does not Granger cause current account balance volatility	7.59896	0.0053
Utilities cost does not Granger cause goods trade balance volatility	16.6468	0.0002
Utilities cost does not Granger cause goods and services trade balance volatility	17.3872	0.0001
Utilities cost does not Granger cause current account balance volatility	9.00245	0.0027
Crude oil price does not Granger cause goods trade balance volatility	4.11959	0.0375
Crude oil price does not Granger cause current account balance volatility	4.90866	0.0229
Exchange rate does not Granger cause goods trade balance volatility	3.75553	0.0476
Exchange rate does not Granger cause goods and services trade balance volatility	3.93005	0.0424
Foreign exchange reserves does not Granger cause goods trade balance volatility	4.97017	0.0221
Foreign exchange reserves does not Granger cause current account balance volatility	8.37803	0.0036
Foreign exchange reserves does not Granger cause goods and services trade balance volatility	6.66092	0.0085

Note: (i) Only statistically significant results are displayed; (ii) Standardised values of all variables are used; (iii) Probability values shown up to fourth decimal place

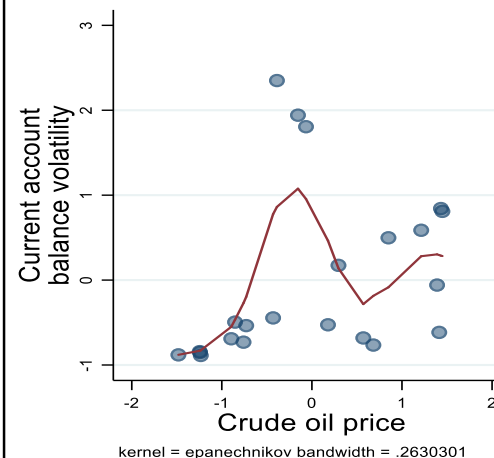
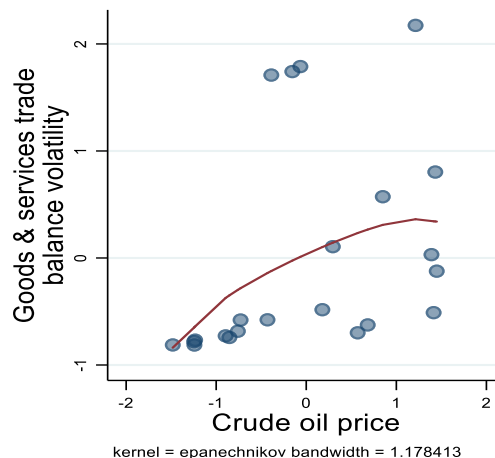
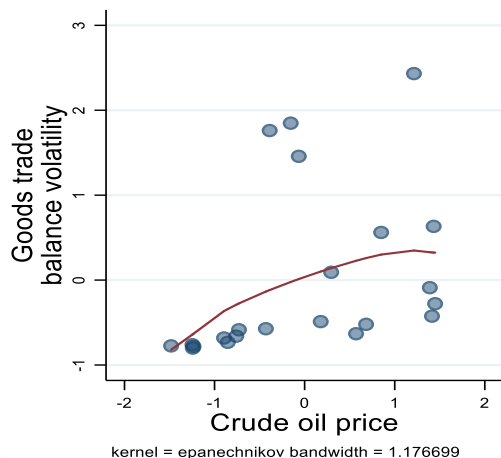
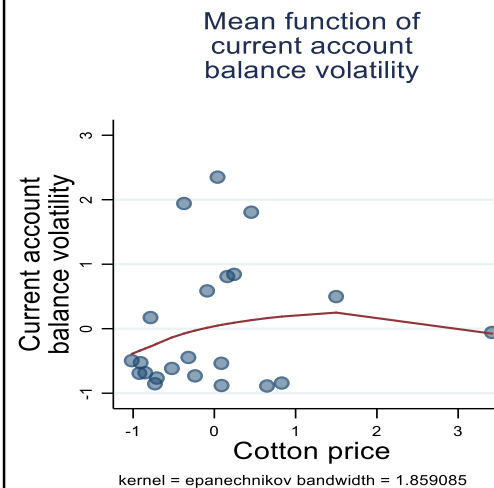
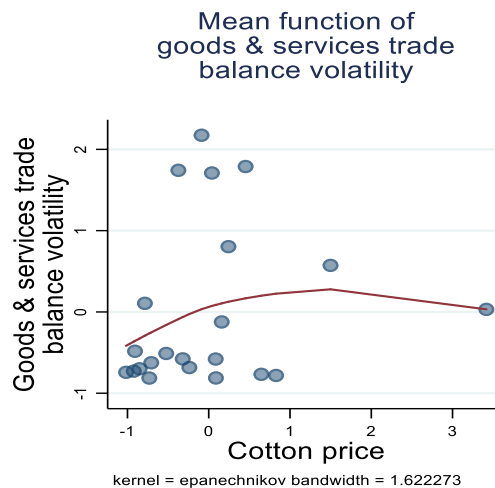
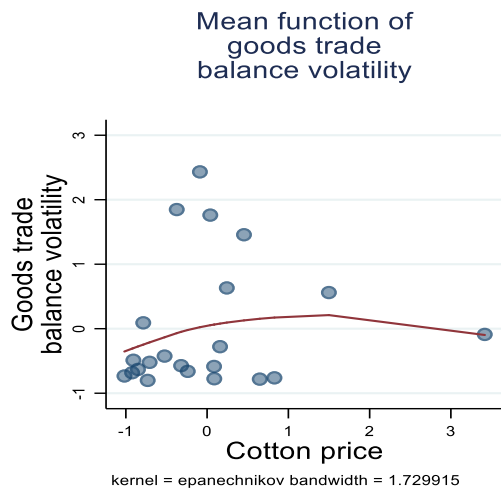
Non-Parametric Regression for Domestic Production Input Prices



Note:

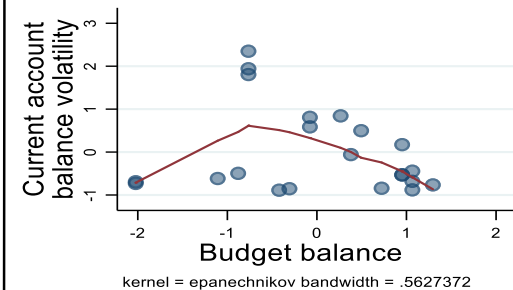
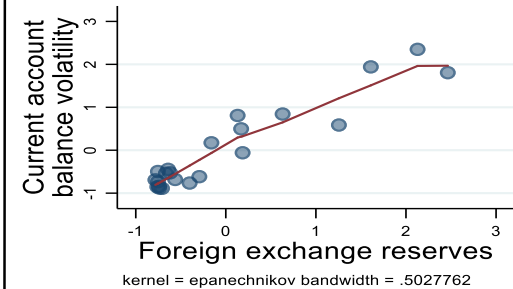
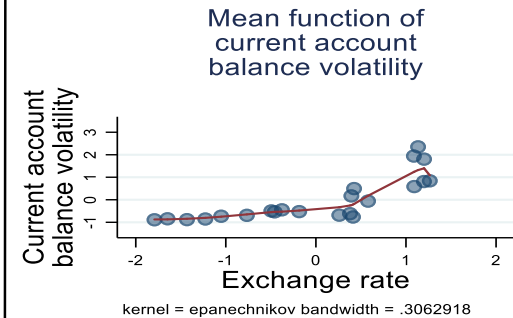
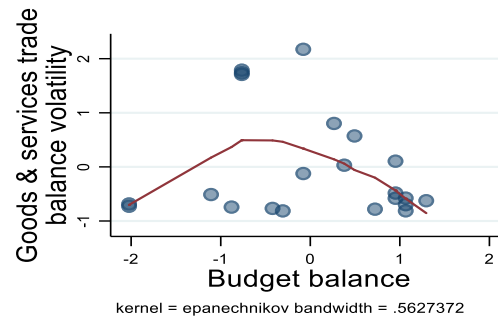
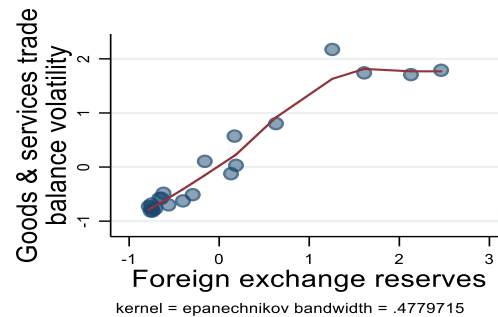
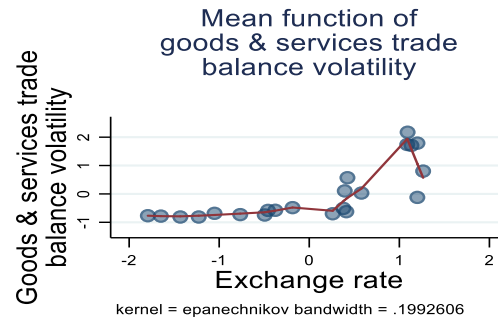
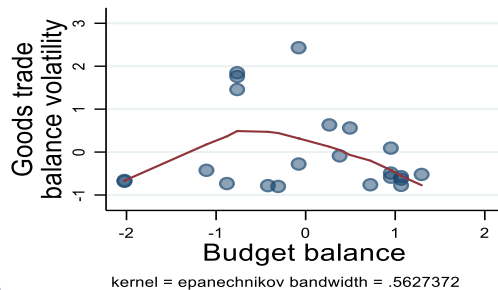
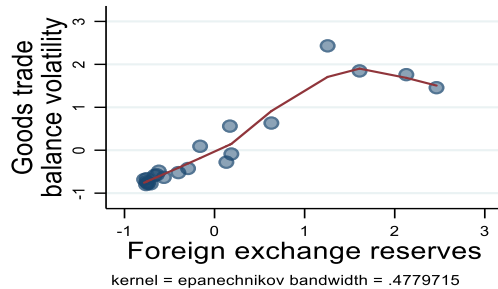
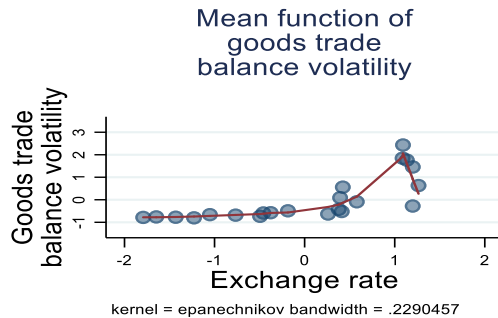
(i) Standardised values of all variables are used

Non-Parametric Regression for Foreign Production Input Prices



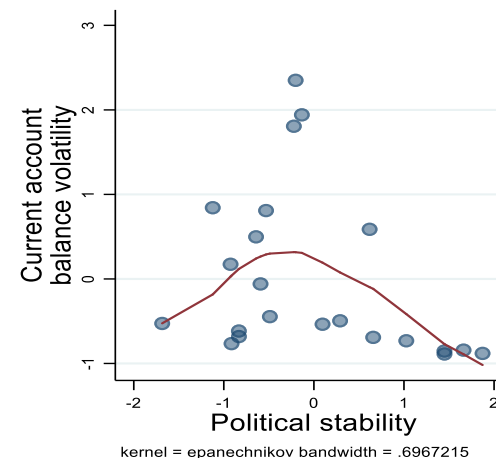
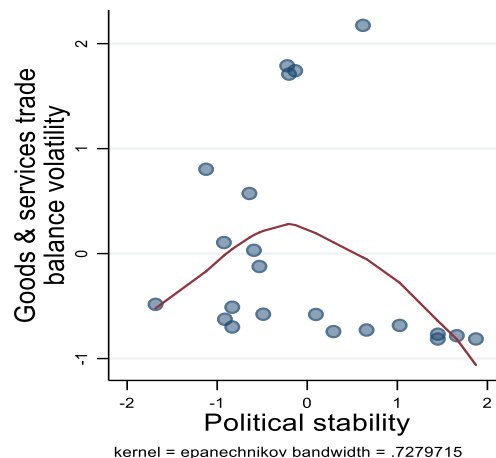
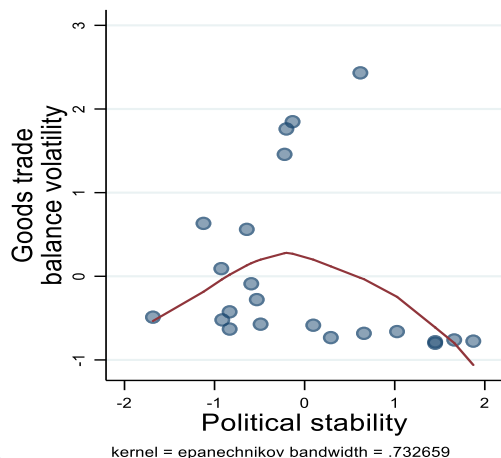
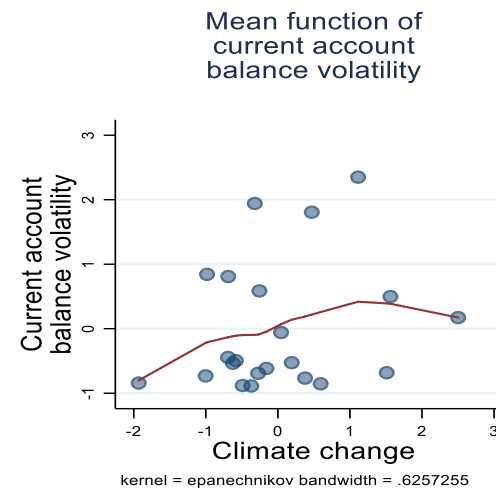
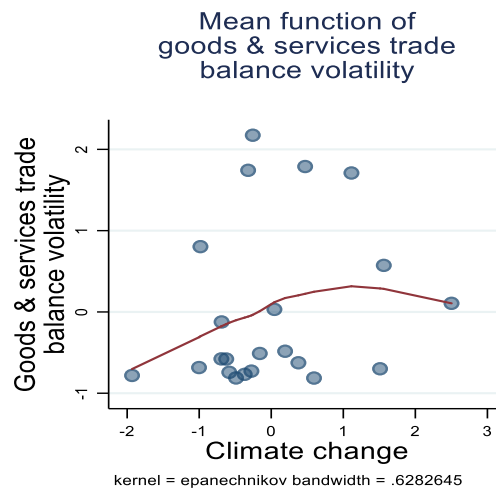
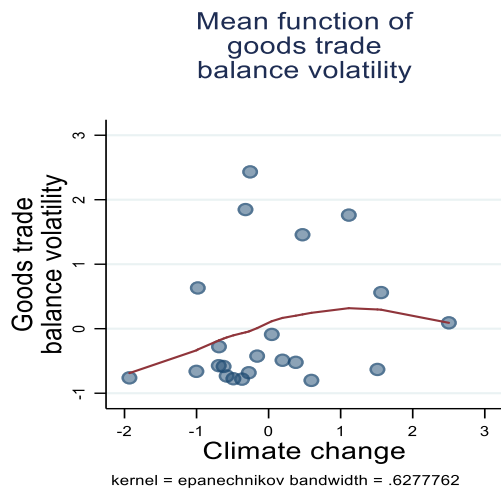
Note: (i) Standardised values of all variables are used

Non-Parametric Regression for Macroeconomic Factors



Note: (i) Standardised values of all variables are used

Non-Parametric Regression for Unforeseen Shocks



Note: (i) Standardised values of all variables are used

Correlation Between Variables

Variable	Minimum wage	Manufacturing cost	Utilities cost	Cotton price	Crude oil price
Minimum wage	1.0000				
Manufacturing cost	0.9300*	1.0000			
Utilities cost	0.9786*	0.9505*	1.0000		
Cotton price	0.2133	0.2373	0.2294	1.0000	
Crude oil price	0.4225	0.6445*	0.4794*	0.2523	1.0000

Variable	Exchange rate	Foreign exchange reserves	Budget balance
Exchange rate	1.0000		
Foreign exchange reserves	0.7644*	1.0000	
Budget balance	0.0119	-0.2097	1.0000

Variable	Climate change	Political stability
Climate change	1.0000	
Political stability	-0.4292*	1.0000

Note: (i) Stars indicate statistical significance at 5 per cent level; (v) Standardised values of all variables are used

Principal Components Analyses

Production input prices

	Explained variance by components			
	Eigenvalue	Proportion	Cumulative	Bias
Component 1	3.349176*** (1.004926)	0.6698 (0.0812)	0.6698 (0.0812)	0.099069
Component 2	0.9411277*** (0.2320221)	0.1882 (0.0602)	0.8581 (0.0452)	0.041959
Component 3	0.65715*** (0.1299635)	0.1314 (0.0441)	0.9895 (0.0032)	-0.133658
Component 4	0.0338839*** (0.0090565)	0.0068 (0.0025)	0.9963 (0.0014)	-0.002889
Component 5	0.0186626*** (0.0044781)	0.0037 (0.0014)	1.0000 (0.0000)	-0.00448

Macroeconomic factors

	Explained variance by components			
	Eigenvalue	Proportion	Cumulative	Bias
Component 1	1.789689** (0.5187924)	0.5966 (0.0952)	0.5966 (0.0952)	0.11492
Component 2	1.006059*** (0.2644375)	0.3354 (0.0906)	0.9319 (0.0237)	-0.092791
Component 3	0.2042517*** (0.057459)	0.0681 (0.0237)	1.0000 (0.0000)	-0.022129

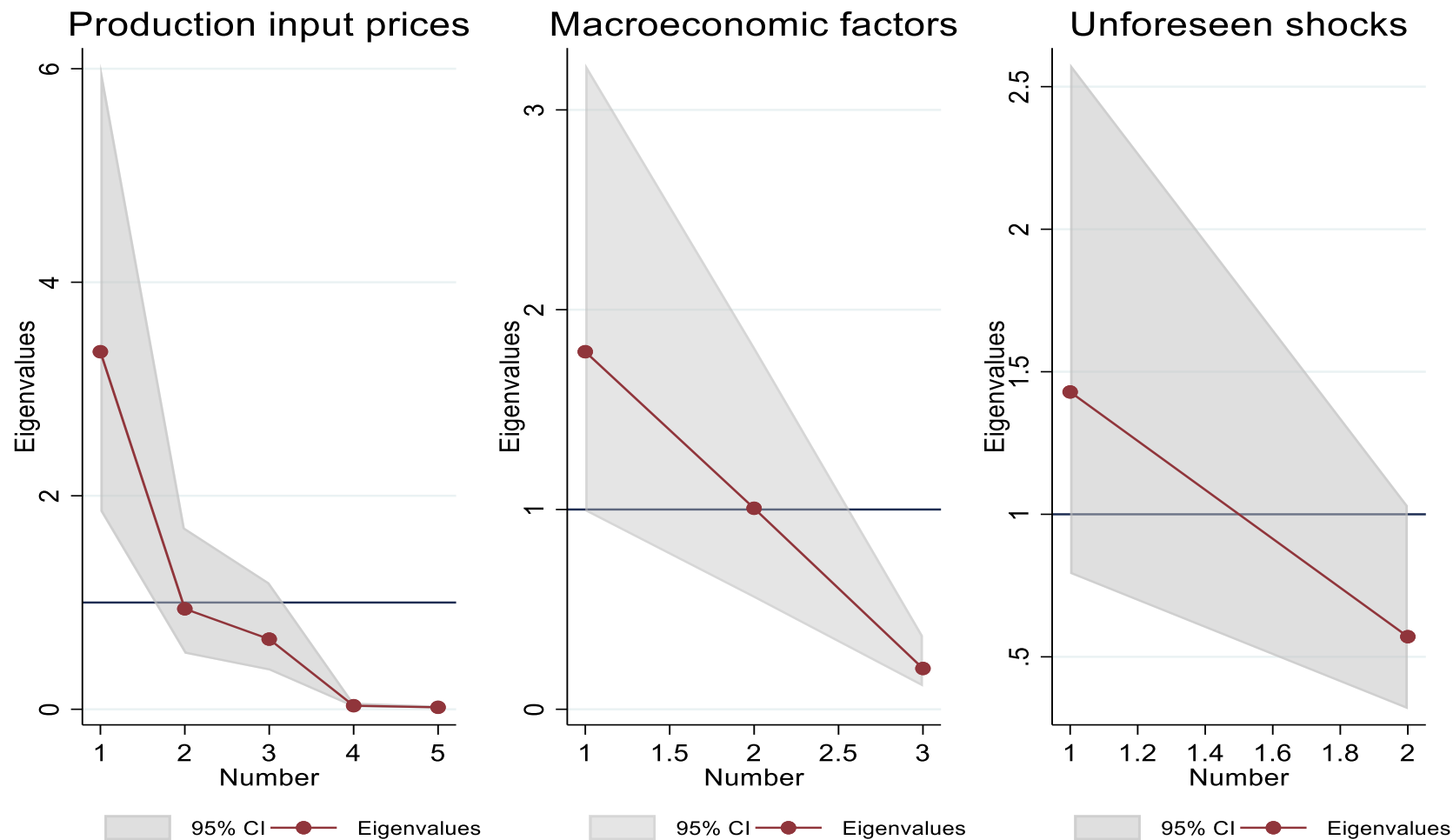
Unforeseen shocks

	Explained variance by components			
	Eigenvalue	Proportion	Cumulative	Bias
Component 1	1.429218*** (0.4265737)	0.7146 (0.0870)	0.7146 (0.0870)	0.043195
Component 2	0.5707818*** (0.1608905)	0.2854 (0.0870)	1.0000 (0.0000)	-0.043195

Note:

(i) Approximate standard errors, assuming multivariate normality, in parentheses; (ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$;
(iii) Standardised values of all variables are used

Scree Plots of Eigenvalues



Note: (i) Horizontal line at eigenvalue equal to 1 shown as reference for Kaiser Criterion

Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy

Variable	Production input prices	Macroeconomic factors	Unforeseen shocks
Minimum wage	0.7370		
Manufacturing cost	0.7430		
Utilities cost	0.7404		
Cotton price	0.8586		
Crude oil price	0.5689		
Exchange rate		0.4586	
Foreign exchange reserves		0.4624	
Budget balance		0.1886	
Climate change			0.5000
Political stability			0.5000
Overall	0.7176	0.4384	0.5000

Note:

(i) KMO value labels: 0.00 to 0.49 – unacceptable, 0.50 to 0.59 – miserable, 0.60 to 0.69 – mediocre, 0.70 to 0.79 – middling, 0.80 to 0.89 – meritorious, 0.90 to 1.00 – marvelous (Kaiser, 1974); (iii) Standardized values of all variables are used

Multivariate Non-Parametric Local-Linear Kernel Regression

Variable	Goods trade balance volatility	Goods and services trade balance volatility	Current account balance volatility
Mean	1.02*10 ⁻⁰⁹ (0.2352277)	-2.03*10 ⁻⁰⁹ (0.2315964)	0.0073002 (0.2817366)
Effect			
Production input prices	0.1096746 (0.215249)	0.1482063 (0.1805216)	-0.1045221 (0.4568169)
Macroeconomic factors	0.5676486** (0.2706538)	0.5352127** (0.2345324)	0.535461 (0.649409)
Unforeseen shocks	0.1249508 (0.1005711)	0.1216049 (0.0968376)	-0.2063305 (0.2447734)
R-squared	0.8114	0.8602	0.9722

Note:

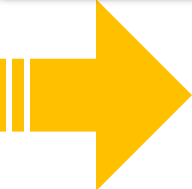
(i) Bootstrap standard errors in parentheses; (ii) *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$; (iii) Automatic bandwidth selection based on improved Akaike Information Criterion (AIC); (iv) Epanechnikov kernel function assumed; (v) 100 bootstrap replications used; (vi) Effect estimates are averages of derivatives; (vii) Standardised values of all variables are used

4. CONCLUSION

Concluding Remarks

- **Overspecialisation in RMG may increase Bangladesh's trade vulnerability**
- **Changes in prices of domestic and imported production inputs may trigger trade volatility**
- **Climate change is expected to increase trade volatility of Bangladesh**
- **Judicious use of policies to regulate macroeconomic indicators hold the key to addressing trade vulnerability of Bangladesh**

A Ten Point Action Plan for Addressing Trade Vulnerability




1. provide targeted support to thrust areas in the forms of tariff protection, fiscal incentives, and financial support, including through preferential credit, infrastructural and logistic facilities



2. deploy various policy instruments in fiscal, monetary and exchange rate policies to improve coordination with trade policy



3. create a conducive environment where firms are able to access modern, state-of-the art technologies, as well as skilled professionals and workers as per the need of the sector

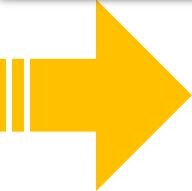


4. build production networks of different manufactured products by considering a framework agreement with countries involved in the upstream part of the value chain



5. prepare adequately for signing Comprehensive Economic Partnership Agreement (CEPA) with regional countries

A Ten Point Action Plan for Addressing Trade Vulnerability



6. pursue initiatives towards better transport connectivity and trade facilitation with the aim capitalizing on opportunities of the growing regional market




7. consider strengthening export presence in the ASEAN market



8. pursue a forward looking strategy which emphasizes a determined effort to revitalise exports



9. develop strategies for diversification of export by expanding the portfolio and reducing risks from the global market volatility



10. strengthen trade diplomacy with developed and developing countries in order to enhance opportunities to increase export of goods and services and to get better market access

THANK YOU



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