University of Moratuwa.

Department of Mathematics, Faculty of Engineering.

Masters of Finance Mathematics

An Evaluation of United States' trade balance with selected two countries including a demographic variable.

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DECLARATION STATEMENT

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ABSTRACT

The purpose of this research study is to estimate the determinants of USA's trade balance with Australia and Germany including a demographic variable (youth dependency ratio) and testing their relationships in the long run.

The research data included over the period of 39 years (1980 – 2018). We run linear regression with these set of variables that are GDP ratio, real exchange rate, nominal exchange rate, price deflator ratio, lending rate ratio, money supply ratio and youth dependency ratio for both the pair of countries.

For both pair of countries namely USA vs Australia and USA vs Germany, all the variables are I (1) which means non stationary. Also, cointegration tests shows that there is a relationship between selected variables. Since these variables (non-stationary) are cointegrated then run the multiple linear regression model to estimate the determinants of USA's trade balance.

For the pair of USA and Australia, we run Engle – Granger test where Australia's import share and GDP ratio are cointegrated at 10% and showed a weaker relationship between those significant variables. There is a positive long run relationship between net exports (NE) and exchange rate (ER) at 5% level of significance.

For the pair of USA and Germany, based on Engle – Granger test there is no strong correlation between Germany's import share and GDP. But there is a positive long run relationship between net exports (NE) and exchange rate (ER) at 10% level of significance.

For the pair of USA and Australia, regression results showed the most important determinant of net export is GDP ratio followed by price deflator ratio, money supply ratio, lending rate ratio and the real exchange rate which explains 89.7% of the variation in net exports. We run F – Test which showed that net exports respond to rising and falling exchange rate regimes symmetrically.

For the pair of USA and Germany, regression results showed that the most important determinant of net export is real exchange rate followed by GDP ratio and youth dependency ratio which explains 76.9% of the variation in net exports. We run F – Test which showed that net exports depend on rising and falling exchange rate regimes.

Results based on error correction model (ECM) suggests that there exists a positive long run relationship between expected exchange rate (ER) and USA's net export (NE) at 5% level of significance, for both pair of countries.

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NE	– USA’s net exports
ADF	– Augmented Dickey Fuller
PP	– Phillip perron
ECM	– Error Correction Model
ECT	- Error Correction Term
U. S	– United states of America
GDP	– Gross domestic product
NEER	– Nominal effective exchange rate
CEIC	– Census and economic information center
BEA	– Bureau of economic analysis
OEC	– The observatory of economic complexity
OECD	- Organisation for Economic Cooperation and Development
CV	– Coefficient of variation

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