

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

Alec Feinberg
Citizens For Equal Trade

Abstract We report here statistical findings that the U.S. trade deficit causes a portion of its budget deficit using a Granger causality study. Many economists have debated whether the trade deficit causes national debt or vice versa. This study covers the sequential key years from 1994 through 2007. This subset of available data is important as it: 1) covers NAFTA (Dec. 1993) and China (Oct. 2000) entrance into the U.S. marketplace, and 2) are relatively well behaved data set. After 2007, data are confounded with outliers due to excessive U.S. budgetary increases. Additionally, before, 1994, the trade deficit was well under 100 billion per year and does not include NAFTA. The influence of NAFTA and China's entrance are particularly of concern, as their continual impact on the U.S. budget deficit needs to be understood where the U.S. trade deficit totaled over \$8 trillion dollars at the end of 2010. Focusing on these select years provides pronounced statistical effects that are more discernable for determining the underlying causal relationship.

JEL H63, F12, E62

Keywords U.S. National Debt, U.S. Trade Deficit, NAFTA Influence, U.S. China Trade Deficit, Twin Deficits, Granger Causality, Wald Test, Trade Deficit and National Debt relationship

Correspondence Dr. Alec Feinberg, Citizens for Equal Trade, Fort Collins, CO, U.S.A; e-mail: support@citizensforequaltrade.org, Dr. Feinberg is also the author of the book, *The Truth of the Modern Recession*.
Website: www.CitizensForEqualTrade.org

1 Introduction

We report here statistical findings that the U.S. trade deficit causes a portion of its budget deficit using a Granger causality study. Many economists have debated whether the trade deficit causes national debt or vice versa. This study covers the sequential key years from 1994 through 2007. Prior articles by this author have suggested plausible reasons for such causality (see Feinberg 2009, 2010). This subset of available data are important as it 1) covers NAFTA (Dec. 1993) and China (Oct. 2000) entrance into the U.S. marketplace and 2) are relatively well behaved data set (i.e. with only 1 outlier). After 2007, data are confounded with outliers due to excessive U.S. budgetary increases. Additionally, before, 1994, the trade deficit was well under 100 billion per year and does not include NAFTAs. These outliers and yearly trade deficits are evident in looking at the labeled time series graph in Figure 1. The influence of NAFTA and China's entrance are particularly of concern, as their continual impact to the U.S. budget deficit needs to be understood where the U.S. trade deficit totaled over \$8 trillion dollars at the end of 2010. Focusing on these select years provides pronounced statistical effects that are more discernable for determining the underlying causal relationship.

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

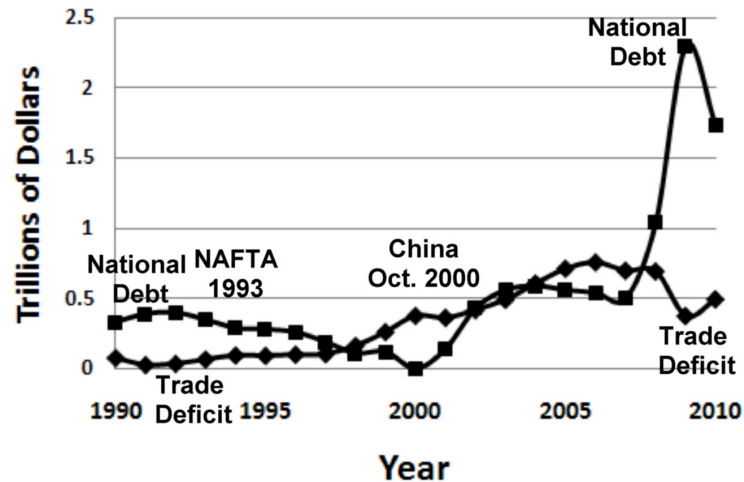


Figure 1 Time series plot of the U.S. trade deficit and budget deficit 1990 to 2010, Table 1

2 Why is Causality Important

If the trade deficit causes national debt, then it means that consumers are essentially bearing the burden of trade deficit in the U.S. through eventual tax increase to help pay off the related budgetary increases. Tax payers then somewhat subsidizes both foreign and domestic companies who import products into the United States. The U.S. national debt is currently under scrutiny by congress whose approach does not include a plan for trade deficit reduction. It is well advised from these results and other findings (see Islam and Rahimian, 2005), that such a plan should be developed.

3 Selected Review of Past Work

There are a wealth of papers and findings that have cited theories and found different causal dependencies and non dependencies between the budget debt and trade deficit. Islam and Rahimian (2005), and Saleh (2006), provide excellent historical overviews for the interested reader. We will not bother to repeat these but only cite some of the key references.

In the Islam and Rahimian paper that covered sequential years from 1960 to 2003, they found

“causality tests show a unidirectional causality between the trade deficit and the budget deficit... Contrary to the theory, our results show that the trade deficit "Granger Cause" the budget deficit.”

Prior to this paper, most economists believed the opposite, that the budget deficit impacted the trade deficit, this often termed the twin deficit theory. Here they thought an increased budget deficit was likely to put pressure on raising domestic interest rates, which in turn, would help raise the government capital needed. The value of dollar would then appreciate along with the exchange rate, subsequently would increase imports and the trade deficit (see Hutchison and Pigott 1984, Fleming 1962, Mundelln 1963). Others have found interest rates are not affected by the size of the budget deficit (see Dewald,1983, Dwyer 1986, Hoelscher 1986, and Evans 1985). Certainly this is exemplified in the U.S. current 2009 and 2010 economic situation in which interest rates have

Pre-print: Submitted to Economics E-Journal, April 26, 2011

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

fallen to historic lows with budgetary surges. Thus until the 2005 paper by Islam and Rahimian, economic theory attributes the trade deficit growth to cause increases in the U.S. government's budget deficit. The contrary findings by these authors on the U.S. economy are not an exception. For example A. S. Saleh, (2006) studied the budget deficit and trade deficit in the developing country of Lebanon during the period from 1975 to 2003. His 2006 paper concluded,

“The Granger causality test shows that causality runs from trade deficit to budget deficit and the relationship is positive and statistically significant.” He also concluded that, “any policy measures to reduce the trade deficit in Lebanon could well assist in reducing the Lebanese budget deficit.”

4 Reason for causality

Proposed explanations for why trade deficits can create national debt through tax revenue losses have been described in prior work (Feinberg 2009, 2010). Amongst these is the constant job outsourcing which creates revenue losses. Seemingly temporary, yet U.S. displaced workers occur frequently enough that U.S. tax burden is yearly. Serious other problems are created by company off-shoring business abroad creating loss of government revenues through tax loop holes. Tax laws on foreign owned domestic businesses are difficult and promote serious losses in tax revenues. The numerous multinational business U.S. entitlements have been detailed by McIntyre, R. (2003). These tax revenue losses have escalated during the NAFTA and China influential years. Appendix A overviews some key proposed trade deficit tax problems in the United States.

5 Data Set of this Study

Data are examined from the U.S. Census Bureau. The data on the government budget deficits are from the White House office of Management and Budget, Fiscal Year, 2010 is displayed from 1994 to 2010 in Table 1. From this data we select two subsets; Set 1, the years 1994 to 2007 and exclude the outlier year 2000, and Set 2 the same years but include the 2000 year outlier. Both sets exclude the outlier years from 2008 to 2010.

Table 1 Data set 1994-2007

Year	Trade Deficit (TD)	National Debt (ND)
1994	0.098	0.29
1995	0.096	0.28
1996	0.104	0.26
1997	0.108	0.19
1998	0.166	0.11
1999	0.265	0.12
2000*	0.38	0.03
2001	0.366	0.14
2002	0.422	0.43
2003	0.495	0.56
2004	0.61	0.59
2005	0.715	0.56

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

2006	0.76	0.54
2007	0.701	0.5
2008*	0.696	1.04
2009*	0.379	2.3
2010*	0.498	1.73

*Statistical Outlier Year well outside the 99.5% confidence band

6 Granger Causality Study

The test used here and by most economists is the Granger causality test. The theory of cointegration, was first introduced by Granger (1980) and then developed by Granger (1986) and Engle and Granger (1987). The degree to which effects operates in each direction can be assessed the Granger-causality Wald tests. Trade Deficit (TD) is said to Granger cause National Debt (ND), if the lags of TD can improve a forecast for variable ND.

Here we test the significance levels for the null hypothesis that the trade deficit does not Granger-cause the fiscal deficit and vice versa for 1 year lag using the data Set 1 (without year 2000) and Set 2 (with year 2000) in Table 1. In order to ascertain the results with 1 lag for Set 1, we chose to model it as a continual time series. This is done in order to see the level of the effect the year 2000 outlier has on the full Set 2 time series by comparing the two.

The Granger causality Walt test results is summarized in Table 2 and show reasonable level of significance regarding causality for both Sets 1 and 2 (full results are in Appendix B). We note the effect the year 2000 outlier has on Set 1 with significance P-level of 0.066 compared to 0.121 for Set 2. The Granger causality is observed below the ten percent level for TD acting on ND for Set 1 and is close to this level for Set 2. In Set 2 we then can justify and take the conservative approach and accept that there is reasonable level significance to warrant that causality does significantly exist. These results with and without outlier provide evidence of significant unidirectional causation that the trade deficit does Granger cause national debt, This is in agreement with Islam and Rahimian, (2005) which found similar results up to 2003.

Table 2 Granger Causality Walt Test Results at the 95% Confidence Level*

Data Set No.	Dependent Variable Y	Regressor X	Chi ²	Prob > Chi ² (P)	N	Period	Outlier Year 2000 Excluded
1	ND	TD	3.381	0.066	12	1994-2007	YES
1	TD	ND	0.182	0.67	12	1994-2007	YES
2	ND	TD	2.4086	0.121	13	1994-2007	NO
2	TD	ND	0.1256	0.723	13	1994-2007	NO

* Result using Stata software – also see Appendix B

Finally, two lag results were not statistically significant. In this case, the result showed good significance in the relationship between national debt and trade deficit, but no discernable causality.

Conclusion

Pre-print: Submitted to Economics E-Journal, April 26, 2011

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

Our results show a reasonable unidirectional causality running from the trade deficit to the budget deficit. No causality has been found from the budget deficit to the trade deficit.

This paper provides statistical support and given the suggested qualitative reasons summarized here, it demonstrates serious concerns about America's Trade deficit situation. The author agrees with the conclusion of Saleh (2006) study that found similar results for his country and also suggested, any policy measures to reduce the trade deficit in Lebanon could well assist in reducing the Lebanese budget deficit." The author feels that this applies in particular to the U.S. trade policy.

References

- Dewald, William G. (1983). "Federal Deficits and Real Interest Rates: Theory and Evidence", *Economics Review*, Federal Reserve Bank of Atlanta 48, no.1.: 20-29.
- Dwyer, Gerald, P. (February 1986). "Inflation and Government Deficits", *Economics Inquiry* 20, no.3. July 1982: 315-329.
- Engle, Robert F., Clive W. J. Granger (March 1987). "Co-integration and Error Correction: Representation, Estimation and Testing", *Econometrica* 55, no.2.: 251-276.
- Evans, Paul (March 1985). "Do Large Deficits Produce High interest Rates?" *American Economics Review* 75, no.1: 68-87.
- Feinberg, A (September 2010), "Reverse Tariff - Economic Crisis Due to Free Trade's Flaw", <http://economyincrisis.org/content/reverse-tariff-economic-crisis-due-free-trades-flaw>
- Feinberg, A. (2009), *The Truth of the Modern Recession*, WE-Economy Press <http://www.amazon.com/Truth-Modern-Recession-Reliable-Solutions/dp/0615315291>
- Fleming, J. M. (1962) "Domestic Financial Policies under Fixed and under Floating Exchange Rates." *International Monetary Fund Staff, Papers* 10: 369-380.
- Granger, C.W.J. (August 1986). "Development in the Study of Cointegrated Variables", *Oxford Bulletin of Economics and Statistics*. 48,: 213-227.
- Granger, C.W.J.. (1980). "Some Development in a Concept of Causality," *Journal of Economic Dynamics and Control*. 2.: 329-352.
- Hoelscher, Gregory P. (February 1986). "New Evidence on Deficits and Interest Rates", *Journal of Money, Credit and Banking* 18, no.1.:1-17.
- <http://economyincrisis.org/content/reverse-tariff-economic-crisis-due-free-trades-flaw>
- Hutchinson, Michael M. and Charles Pigott (1984). "Budget Deficits, Exchange Rates and Current Account; Theory and U.S. Evidence", *Economics Review*, Federal Reserve bank of San Francisco, 5-25.
- Islam, M., and Rahimian, E. (2005). "An Empirical Analysis of the Relationship Between the Budget Deficit and the Trade Deficit", *Journal of Academy of Business and Economics*, 5-2, 1542
- McIntyre, R. (2003). "Tax Breaks for Multinational Corporations", www.ctj.org/hid_ent/contents/content.htm#shelly
- Mundell, R.A. (1963). "Capital Mobility and Stabilization Policy Under Fixed and Flexible Exchange Rates." *Canadian Journal of Economics and Political Science* 29: 475-85.
- Saleh, A.S. (2006), 'Long-Run Linkage Between Budget Deficit and Trade Deficit in Lebanon: Results from the UECM and Bounds Tests,' *Journal of Economics and Management*, 13, no. 1: 29-48.
- U.S. Census Bureau (2010), Trade Def. data, www.census.gov/foreign-trade/statistics/historical/gands.pdf,
- White House, Office of Management and Budget (2010), <http://www.whitehouse.gov/omb/budget/Historicals>

Appendix A

Pre-print: Submitted to Economics E-Journal, April 26, 2011

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

Here we provide simple examples of trade deficit associated tax collection losses and non losses.

U.S. Import Related Tax Consequences:

- 1) Imports create decreases in federal tax revenues for various reasons, such as products made by non U.S. citizens who do not pay federal tax compared to products or services that would have created tax revenues if the products were not imported. Thus as U.S. made goods are replaced with foreign imports, so too are U.S. jobs and lost taxed wages in addition to unemployment benefits. Seemingly temporary, yet U.S. displaced workers occur frequently enough that the U.S. taxes burden is yearly.
- 2) U.S. trade deficit enables foreigners to buy numerous domestic businesses and own more and more of the U.S. revenue bearing companies. IRS data show that foreign-owned corporations doing business here typically pay far less in U.S. income taxes than do purely American firms with comparable sales and assets. This is because it's hard to determine how much of a corporation's worldwide earnings relate to its U.S. activities and therefore are subject to U.S. tax. There are many other tax issues that create serious tax problems which have been detailed by McIntyre, R. (2003).
- 3) Many U.S. CEOs outsource jobs creating service trade deficit tax losses, these "imported services" decrease potential tax revenues of the company's workforce compared to non outsourcing. This also creates higher unemployment. Unemployment causes more lost tax dollars due to U.S. government subsidies until workers can recover.

These are basic examples, but serve to help in understanding the reasons for reliability economic concerns of lost government tax revenues related to the U.S. historic trade deficit.

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

Appendix B Statistical Granger Software Results

Stata Software Output, Data Set 1: 1994-2007 with outlier year 2000 omitted.

Vector autoregression

Data Set 1: 1994-2007 with outlier year 2000 omitted

No. of obs	=	12
Log likelihood	=	31.78791
AIC	=	-4.297985
FPE	=	.0000476
HQIC	=	-4.38775
Det(Sigma_ml)	=	.0000171
SBIC	=	-4.055531

Equation	Parms	RMSE	R-sq	chi2	P>chi2
td	3	.058594	0.9566	264.6917	0.0000
nd	3	.096629	0.7917	45.61387	0.0000

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
td	td						
	L1.	1.032551	.1012536	10.20	0.000	.8340976	1.231005
	nd						
	L1.	-.057667	.1351483	-0.43	0.670	-.3225528	.2072188
	_cons	.0584023	.0314248	1.86	0.063	-.0031892	.1199937
nd	td						
	L1.	.3070258	.1669814	1.84	0.066	-.0202517	.6343032
	nd						
	L1.	.5520256	.2228784	2.48	0.013	.115192	.9888593
	_cons	.061851	.0518239	1.19	0.233	-.0397219	.1634239

. vargranger

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
td	nd	.18207	1	0.670
td	ALL	.18207	1	0.670
nd	td	3.3808	1	0.066
nd	ALL	3.3808	1	0.066

U.S. Trade Deficit Creates Budget Deficit –NAFTA and China Causality Study

Stata Software Output, Data Set 2: 1994-2007 with outlier year 2000.

Vector autoregression

Data Set 2: 1994-2007 with outlier year 2000

No. of obs	=	13
Log likelihood	=	32.47746
AIC	=	-4.073456
FPE	=	.0000593
HQIC	=	-4.127051
Det(Sigma_ml)	=	.0000232
SBIC	=	-3.81271

Equation	Parms	RMSE	R-sq	chi2	P>chi2
td	3	.06045	0.9487	240.6017	0.0000
nd	3	.103853	0.7851	47.50388	0.0000

		Coef.	Std. Err.	z	P> z	[95% Conf. Interval]	
td	td						
	L1.	.9714559	.0899737	10.80	0.000	.7951108	1.147801
	nd						
	L1.	.0383935	.1083496	0.35	0.723	-.1739678	.2507549
	_cons	.0443432	.0294742	1.50	0.132	-.0134252	.1021115
nd	td						
	L1.	.2398939	.1545743	1.55	0.121	-.0630661	.5428539
	nd						
	L1.	.6876185	.1861441	3.69	0.000	.3227828	1.052454
	_cons	.0300654	.0506365	0.59	0.553	-.0691803	.1293112

. vargranger

Granger causality Wald tests

Equation	Excluded	chi2	df	Prob > chi2
td	nd	.12556	1	0.723
td	ALL	.12556	1	0.723
nd	td	2.4086	1	0.121
nd	ALL	2.4086	1	0.121