Journal of Applied Finance & Banking, vol. 3, no. 5, 2013, 85-91
ISSN: 1792-6580 (print version), 1792-6599 (online)
Scienpress Ltd, 2013

Does External Debt Increase Net Private Wealth? The Relative Impact of Domestic versus External Debt on the US Demand for Money

Meng Li[1] and Sumaria Mohan-Neill[2]

Abstract

The paper investigates the effects of domestic vs. external debt on money demand using US data from 1966Q1 to 2011Q1 period. The cointegration analysis reveals that there is no long-term equilibrium between external debt and money demand, suggesting the US government fails to effectively convert the proceeds from public debt into increased perceived private wealth. On the other hand, the existence of a long run positive correction between domestic debt and money demand implies that domestic bondholders view interest income as extra wealth, without fully discount future tax liabilities.

JEL Classification numbers: E41.
Keywords: Demand for money, external debt, domestic debt, and private wealth

1 Introduction

The global financial crisis and fiscal stimulus ensued have led to accumulation of huge government debt in the US. And as the national debt has increased, foreign holdings as a share of total privately held public debt has increased from 52.2% in 2008 to 56.9% in the end of 2011 (Murray and Labonte 2012). The fast growing foreign ownership of US public debt has raised the attentions of policymakers and academics on the effect of large external debt.

The efficacy of the expansionary fiscal policy hinges upon the standard Keynesian argument that pubic debt is perceived as net wealth (Schlicht 2004, Woodford 1998, Barro 1974, Gehrels 1957, Domar 1944, Keynes 1936). When perceived wealth increases as a result of public debt issuance, desired consumption and investment of private sector will increase (Pigou 1947 and Gehrels 1957), which leads to an increase in productivity

[1]Meng Li, Roosevelt University, Chicago, USA.
[2]Sumaria Mohan-Neill, Roosevelt University, Chicago, USA.

Article Info: *Received :* May 16, 2013. *Revised :* June 11, 2013.
Published online : September 1, 2013

and economic growth. Notably, however, most of the existing framework establishing public debt as net wealth is built on the case of closed economy, without consideration of foreign ownership of public debt. Therefore the question remains whether external debt increases net wealth of private sector.

Public debt could create private wealth in two ways. First, since government bonds are interest-bearing assets, if the private sector does not fully discount future tax liabilities resulting from the new debt, the interest revenue represents a source of net wealth (Schlicht 2004). This line of reasoning, however, cannot explain how external debt generates net wealth, because foreign debt does not produce interest income for the domestic investors. Alternatively, government can increase the perceived private wealth by channeling the bond proceeds to consumers and businesses (Modigliani 1961). Therefore, if the proceeds from external debt are effectively directed to the people who are willing to consume or lend to the companies who are willing to invest, the external debt could also be viewed as a source of private wealth. For the mechanism to function properly, however, two conditions must be met: (1) a healthy credit market with no "liquidity trap", where banks are not sitting on the reserves and are willing to lend the money out, and (2) the private sector receiving the stimulus money and spending it on consumption or investment goods, rather than saving it (Cochrane 2009).

Existing empirical studies in the US economy have focused on the effect of total public debt on net wealth by testing the relationship between public debt and money demand. Since money demand is a function of wealth (Keynes 1936), a positive correlation between public debt and money demand would confirm the argument that public debt is a source of private wealth. The Positive debt-money relationship has been found in the studies of Butkiewicz (1979), Barth, Iden and Russek (1984-85), Deravi, Hegji and Moberly (1990), and Li (2013). On the contrary, other studies conclude that public debt does not increase net wealth, such as Evans (1985n), Gulley (1994), Tanner and Devereus (1993), and Wheeler (1999).

One of the major reasons for the mixed empirical results is that the existing literature has failed to distinguish domestic vs. external debt and the two different wealth generating mechanism discussed above. This paper is the first effort in recognizing the different wealth generating mechanism and investigating the effects of domestic vs. foreign debt on money demand separately. By employing cointegration analysis to the US data from 1966Q1 to 2011Q1 period, the results reveal that there is no long run equilibrium between external debt and money demand, suggesting the US government fails to effectively convert the proceeds from public debt into increased perceived private wealth. On the other hand, the existence of a long run positive correction between domestic debt and money demand implies that domestic bondholders view interest income as extra wealth, without fully discount future tax liabilities.

The paper is organized as follows. Section 2 discusses theoretical model and methodology along with description of variables and data. Section 3 presents empirical results. Section 4 concludes.

2 Methodology and Model

2.1 Variables and Data

According to the liquidity preference theory proposed by Keynes in 1936, there are three motives behind the demand for money: (1) the transaction motive, (2) the precautionary motive, and (3) the speculative motive. He postulated that demand for both transactional and precautionary money is proportional to income, whereas the demand for speculative money is negatively related to the level of interest rates, because a rise in interest rates encourages people to hold their wealth as bonds rather than real money for a given level of income. Keynes also pointed out that money is valued in terms of what it can buy, therefore, people want to hold a certain amount of real money balance (the quantity of money in real terms) – an amount that his three motive indicate would be positively related to income and negatively related to interest rates and inflation (Mishkin 1997).
Applying Keynes' liquidity preference theory, a money demand specification that includes domestic vs. external government debt as independent variables can be written as:

$$\ln M_t = \beta_1 + \beta_2 \ln Y_t + \beta_3 \ln R_t + \beta_4 \ln DB_t + \varepsilon_t \quad (1)$$

$$\ln M_t = \beta_1 + \beta_2 \ln Y_t + \beta_3 \ln R_t + \beta_4 \ln EB_t + \varepsilon_t \quad (2)$$

M_t= US M1 real money demand,
Y_t = Real GDP,
R_t = Short term interest rates (prime interest rate),
DB_t =Real domestic debt outstanding,
EB_t =Real external debt outstanding,

All quarterly data covering period from 1966Q1 through 2011Q1 are from the FRED (Federal Reserve Economic Data) database. M1 money demand and government debt are deflated using GDP deflator to reflect the real terms of money demand and government debt. All data series are in logarithmic form.

2.2 Tests for Unit Roots

The methods used in this study to investigate the stationarity of the time series are the Augmented Dickey-Fuller (ADF) and the Phillips-Perron (PP) tests. The testing procedure for ADF is applied to the model:

$$\Delta y_t = \alpha + \beta t + \gamma y_{t-1} + \sum_{t=2}^{p} \delta_t \Delta y_{t-1} + \varepsilon_t$$

Where Δ is the first differencing operator, p is the lag order of the autoregressive process. The null hypothesis that y_t is nonstationary is rejected if γ is significantly negative. τ statistic for coefficient γ is computed and compared to the critical value for ADF test. If τ statistic is less than the critical value, null hypothesis is rejected and no unit root is present.

2.3 Johansen Cointegrtion Test

Johansen procedure (1996, 1988) is appropriate for testing cointegration of several time series, because it permits more than one cointegration relationship. Johansen approach starts with the unrestricted vector error correction model (VECM):

$$\Delta y_{t-1} = \mu + \Pi y_{t-1} + \sum_{i=2}^{p-1} \Gamma_i \Delta y_{t-i} + \varepsilon_t$$

Where y_t is a $(n \times 1)$ vector of I(1). This model contains information on both the short and long run adjustments to changes in y_t via the estimates of Γ_i and Π respectively. The rank of Π indicates the cointegration rank r, that is rank (Π) = r. If r=0, no cointegration is evident. If r=n, all variables in the model are stationary and there is no spurious regression. If 1< r < n, r cointegration vectors are present. For example, r=1 indicates the existence of one cointegration process.

3 The Findings

The purpose of this study is to investigate whether US domestic vs. external debt along with other variables have long run effects on the demand for money through the use of Johansen multivariate cointegration procedure. The procedure starts with checking level of integration of each time series in Equation [1].

3.1 Stationarity of the Variables

Table 1 presents the results of ADF and the Phillips-Perron (PP) stationarity test procedures. All the variables are nonstationary in levels from both ADF and PP tests. Thus, they all need to be differenced once in order to become stationary. Additional ADF and PP tests on first difference are performed in all series. The results show that all the variables appear to be stationary in first difference. Therefore, we treat all time series as integrated of order one, denoted as I(1).

Table 1: ADF and PP unit root test results

	Levels		**First Differences**	
Variables	**ADF (4)**	**PP(4)**	**ADF(4)**	**PP(4)**
lnM	1.08	1.38	-3.86 **	-9.96 **
lnY	3.28	5.80	-3.47**	-8.33 **
lnR	-0.69	9.70	-4.20 **	-6.88 **
lnDB	2.14	4.34	-2.76 **	-5.98 **
lnEB	2.08	3.26	-5.56 **	-6,16 **

Note: lag 4 is used in all tests. ** and * represents the levels of significance at 1% and 5% respectively.

3.2 Cointegrating Analysis of Real Money Demand

As the above results support the hypothesis of nonstationarity, a natural extension is to test for cointegration. We apply Johansen's cointegration methodology to investigate whether or not there is a long-run relationship among the variables specified in money demand Equation [1] and [2].

The test results for domestic debt and money demand in Equation [1] are presented in Table 2. The trace test reveals that the null hypothesis of no cointegration (r = 0) against the alternative of the presence of one or more cointegrating vector is rejected at the 5% level of significance, implying that there is one cointegration relationship among real money demand, real domestic debt, real GDP, interest rate.

Table 2: Cointegration Rank Test for Domestic Debt and Money Demand

H0: Rank=r	**H1: Rank>r**	**Eigenvalue**	**Trace**	**5% Critical Value**
0*	**0**	0.1181	40.0569	39.71
1	**1**	0.0931	19.7056	24.08
2	**2**	0.0185	3.8705	12.21
3	**3**	0.0052	0.8377	4.14

Note: Trace test indicates 1 cointegration equation at the 0.05 level. * denotes rejection of null hypothesis at the 0.05 level.

The test results for external debt and money demand in Equation [2] are presented in Table 3. The trace test reveals that the null hypothesis of no cointegration (r = 0) against the alternative of the presence of one or more cointegrating vector cannot be rejected at the 5% level of significance, implying that there is no cointegration relationship among real money demand, real foreign debt, real GDP, interest rate.

Table 3: Cointegration Rank Test for External Debt and Money Demand

H0: Rank=r	**H1: Rank>r**	**Eigenvalue**	**Trace**	**5% Critical Value**
0	**0**	0.1161	37.0208	39.71
1	**1**	0.0742	24.08	24.08
2	**2**	0.0275	4.5410	12.21
3	**3**	0.0001	4.14	4.14

Note: Trace test indicates no cointegration equation at the 0.05 level.

3.3 OLS Regression on Domestic Debt and Money Demand

Since there is one cointegration vector, the long-run domestic debt and money demand relation can be economically interpreted and reported as shown in Equation [1]. We therefore proceed with OLS estimation of Equation [1]. However, we exclude real GDP from the estimation because it is highly correlated with domestic debt, with a correlation coefficient of 0.95961. The coefficient estimation of Equation [1] without real GDP is presented in Table 4.

Table 4: Long-run Domestic Debt and Real M1 Demand Equation

Variables	**Parameter Estimate**	**t Value**	**Pr > |t|**
Intercept	4.97838 ***	54.57	<0.0001
lnDB	0.22001 ***	22.30	<.0001
lnR	-0.10021 ***	-7.76	<0.0001

Note: Adjusted R^2 =0.8652 *** indicates significance at 1% level.

Consistent with the standard Keynesian theories, the domestic public debt has a significant impact on the demand of money. The positive coefficient of 0.22 indicates that the long-run domestic debt elasticity for real M1 is 0.22. The negative correlation between short-term interest rate and real money balance is also in line with the transactions and precautionary theories of money holding.

4 Conclusion

The above cointegration analysis shows that a long run equilibrium correlation exists between domestic debt and US demand for money, but not between external debt and money demand, suggesting that domestic rather than external debt can be viewed as net wealth. Domestic debt increases private wealth, because government bonds are interest-bearing assets. Domestic bondholders perceive interest income as net wealth, without fully discount future tax liabilities. On the other hand, external debt fails to increases net wealth, implying that the proceeds from the bond issuance are not effectively directed to the consumer and business that are willing to consume and invest, either because the credit market is not functioning properly, or the recipients of subsidies tend to save rather than spend.

The finding that external debt does not increase private wealth has significant implication for establishing appropriate monetary and fiscal policy. A key incentive for government to use foreign debt is to ease the inflationary pressure on the economy caused by heavy domestic borrowing. However, excessive amount of foreign debt has the potential to be harmful to the U.S. economy. Specifically, a foreign government might use financial leverage as a creditor against the U.S. and its foreign policy. For instance, if foreigners suddenly decided to dump their holdings in US public debt, the dollar could plummet in value and interest rates could rise. Therefore, prudent management of public debt requires careful balancing of the advantages and risks of accruing foreign borrowing. For example, to improve the efficacy of "expansionary" fiscal policy, when inflationary pressure is minimal, the government should take into consideration that external debt does not increase private wealth, and consequently have policies that limit foreign borrowing, while encouraging nondebt foreign inflows, such as strengthening export activity.

References

[1] Barro, Robert J. Are government bonds net wealth? *Journal of Political Economy* **82**(6), (1974), 1095-1117.

[2] Barth, JR, Iden, G & Russek, F, Do federal deficits matter? *Contemporary Policy Issues*, **3**, (1984-1985), 7-54.

[3] Butkiewicz, JL, Outside wealth, the demand for money, and the crowding out effect,

Journal of Monetary Economics, April (1979), 249-81.

[4] Cochrane, J.H. Fiscal Stimulus, Fiscal Inflation, or Fiscal Fallacies? (2009), http://faculty.chicagobooth.edu/john.cochrane/research/papers/fiscal2.htm

[5] Deravi, MK, Hegji, CE & Moberly, HD, Government debt and the demand for money: and extreme bound analysis, *Economics Inquiry*, **28**, (1990), 390-401.

[6] Domar, Evsey D. The 'Burden of the Debt' and the National Income. *American Economic Review*, **34**(4), (1944), 798–827.

[7] Evans, P, Do large deficits produce high interest rates? *American Economic Review*, **75**, (1985), 68-87.

[8] Gehrels, Franz. Government Debt as a Generator of Economic Growth. *The Review of Economics and Statistics*, **39**(2), (1957), 183–92.

[9] Gulley, OD, An empirical test of the effects of government deficits on money demand, *Applied Economics*, **26**, (1994), 239-247.

[10] Johansen, S, Statistical Analysis of Cointegration Vectors, *Journal of Economic Dynamics and Control*, vol. **12**, (1988), 231–254.

[11] Johansen, S, *Likelihood Based Inference on Cointegration in the Vector Autoregressive Model* (2nd ed.), Oxford University Press, Oxford, 1996.

[12] Keynes, John Maynard. *The General Theory of Employment, Interest, and Money*.Harcourt, Brace and World, 1936.

[13] Mishkin, FS, *The Economics of Money, Banking, and Financial Markets*, Addison Wesley publication, pp. 674. 1997.

[14] Modigliani, F. Long-Run Implications of Alternative Fiscal Policies and the Burden of the National debt. *Econ. J.* **71**, (1961), 730-55.

[15] Murray, J. and Labonte, M. Foreign Holdings of Federal Debt. *Congressional Research Serve www.crs.gov* , 2012.

[16] Pigou, A.C. Economic Progress in a Stable Environment. *Economica*, **14**(55), (1947), 180–88.

[17] Schlicht, E. Public Debt as Private Wealth. Munich Discussion Paper No. 2004-13, (2004), http://epub.ub.uni-muenchen.de/371/.

[18] Tanner, E & Devereux, J, Deficits and the demand for money, *Southern Economic Journal*, **60**(2), (1993), 316-326.

[19] Wheeler, M, The Macroeconomic Impacts of Government Debt: An Empirical Analysis of the 1980s and 1990s, *Atlantic Economic Journal*, **27**(3), (1999), 273-284.

[20] Woodford, Michael. Public Debt and the Price Level. Bank of England Conference on Government Debt and Monetary Policy, (1998), http://faculty.wcas.northwestern.edu/~lchrist/papers/boe.pdf.