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The Impact of Foreign Exchange Reserve Accumulation on External Debt

외환보유고 축적이 대외채무에 미치는 영향

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Abstract

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This paper analyzes the impact of foreign exchange reserves on external debt using panel analysis for 73 non-reserve currency countries during 1998-2015. The empirical results show that the increase of foreign exchange reserves has positive and significant impact on external debt. Also, the sectoral analysis classifying holders of external debt into the private and the public sector confirms that external debt of the private sector responds significantly to changes in foreign exchange reserves, while that of the public sector shows insignificant response. As previous literature supposes, the findings of this study imply that the increase of foreign exchange reserves as the precautionary demand ironically provides incentives for the private sector to increase external debt. This paper suggests two interpretations for the empirical results: (1) if the central bank absorbs foreign currency into reserves, it can cause the lack of foreign currency liquidity in the domestic FX market and lead to the increase of international borrowing by the private sector; and (2) increased foreign exchange reserves lower the credit risk of the country and facilitate international borrowing of the private sector, leading to the increase of external debt.

Keywords: External debt, Foreign exchange reserves, Foreign currency liquidity, Sectoral analysis
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1. Introduction

Foreign exchange reserves have been dramatically increasing over the past few decades, especially in emerging and developing countries. Among the ten biggest holders of the foreign exchange reserves, eight countries are the developing or emerging countries: China, Saudi Arabia, Taiwan, Russia, Hong Kong, India, Korea, Brazil.[1]

As a large amount of foreign exchange reserves have been accumulated, many countries are faced with its side effects such as costs of holding and operating reserves, which refer to quasi-fiscal costs or social costs (Rodrik, 2006; Yeyati, 2008). Most studies analyzing the costs of the foreign exchange reserve accumulation have mainly focused on its direct or physical costs such as the quasi-fiscal costs. However, besides these costs, increased foreign exchange reserves can cause unexpected and indirect economic costs as well. Based on this view, I attempt to determine its impacts on the international investment position, especially on external debt in this paper.

This study finds that foreign exchange reserves have positive impacts on changes in external debt, particularly external debt held by the private sector. The result can be supported by two cases. The first case is that absorbing foreign currency

[1] The rest two countries are Japan and Switzerland. Both countries are classified as the developed countries according to the Bank for International Settlements (BIS) standard.

from the domestic foreign exchange market and holding it as reserves would cause a lack of liquidity of foreign currency in the market. In this case, firms and financial institutions need to finance foreign currency directly from abroad, which leads to an increase of external debt in the private sector. Secondly, one country's large amount of foreign exchange reserves would signal low credit risk to the domestic and international markets, and lower the barrier to international borrowing. Then it provides incentives to enlarge external debt for the private sector.[2]

There exist little literature studying the impacts of foreign exchange reserves on external debt. Fukuda and Kon (2010) examines the impacts of foreign exchange reserve accumulation on external debt and its maturity using pooled ordinary least squares (OLS) regression models. It shows that foreign exchange reserves increase both liquid and total external debt, while shortening the average maturity under the assumption of small open economy (SOE) model where the reserve accumulation reduces the costs of liquidity risk. However, the regression model in this study is too simple, including only one explanatory variable, GNI.

Also, Kim (2011) focuses on the impact on short-term external debt using panel analysis for emerging countries. It shows foreign exchange reserves have positive impact on both the growth rate of short-term external debt and the share of short-term debt of total external debt. This study explains the result in terms of moral hazard of financial institutions.

[2] Kim (2011) explains this case in terms of moral hazard of domestic financial institutions and risk-taking behaviors of foreign investors.

Both studies presuppose the increase of foreign exchange reserves provides sufficient incentives to increase short-term (or liquid) external debt in the private sector by reducing the liquidity risk. However, they do not present any empirical evidence for the sectoral – the private and public sector – differences. So, this paper attempts to develop the previous studies by including the sectoral analysis and figure out the impact of foreign exchange reserves on external debt with panel regression model.

The rest of the paper is organized as follows. Section 2 provides an overview of external debt and foreign exchange reserves. This section also discusses possible scenarios for the positive correlation between external debt and foreign exchange reserves. Section 3 describes the data and empirical model, and the empirical results are reported in section 4. Section 5 concludes the paper.

2. Overview of External Debt and Foreign Exchange Reserves

Before introducing external debt, I first examine one country's external liabilities recorded in the International Investment Position (IIP). The externality means that residents of an economy have liabilities to nonresidents. Liabilities are classified intro four functional categories: Direct investment, Portfolio investment, Financial derivatives (other than reserves) and Employee Stock Options(ESOs), and Other investment.[3]

External debt, however, is defined as the outstanding amount of actual current and not contingent liabilities that require payments of principal and/or interest by the debtor at some points in the future and that are owed to nonresident by residents of an economy. Thus, external debt excludes liabilities which are not outstanding or do not include arrears of principal or interest: all equity, investment fund shares, financial derivatives and ESOs.[4] External debt, therefore, equals to debt liabilities in the IIP statement. Details of the link between liabilities and external debt are in Table 1 below.

[3] Balance of Payments and International Investment Position Manual (2009)
[4] External Debt Statistics: Guide for Compilers and Users (2014)

Liabilities by functional category	External Debt Position
Direct investment	
Equity and investment fund shares	
Debt instruments	DI: Intercompany lending
Portfolio investment	
Equity and investment fund shares	
Debt securities	Debt securities
Financial Derivatives (other than reserves) and ESOs	
Other investment	
Other equity	
Debt instruments	
SDRs	SDRs (allocations)
Currency and Deposits	Currency and Deposits
Loans	Loans
Insurance, pension, standardized guarantee schemes	Other debt liabilities
Other accounts receivable/payable	
Trade credit and advances	Trade credit and advances
Other accounts receivable/payable – other	Other debt liabilities
Total liabilities	
Of which: Total debt instruments	**Gross EDP**

Table 1 Link between Liabilities and External Debt

(*Note*: 1) Shaded areas do not cover debt liabilities. 2) EDP means external debt position.)

(*Sources*: IMF, External Debt Statistics)

Foreign exchange reserves (forex reserves) consist of monetary gold, SDR holding, IMF reserve position and other reserve assets (financial derivatives, loans to nonbank nonresidents and other claims) as well as foreign currency reserves held by a central bank or monetary authority.[5] Corresponding to liabilities in the IIP, forex reserves are covered in assets as reserve assets in the IIP and the Balance of Payment (BOP).

Forex reserves are defined as external assets for the central bank's or the monetary authority's specific purposes: for meeting balance of payments financing needs, for intervention in exchange markets to affect the currency exchange rate, for maintaining confidence in the currency and the economy, and for serving as a basis for foreign borrowing.[6] Thus, determining the level of forex reserves is strongly dependent on precautionary and stabilizing needs. Therefore, even after the end of the Bretton Wood system and most countries adopted the flexible exchange rate regime, forex reserves still have a strong tendency to rise in many countries. Aizenman and Marion (2003) and Aizenman and Lee (2007) explain this upward trend in terms of precautionary demand. Both studies suggest that risk aversion against volatility risks or sovereign risks, accompanied by commercial and financial market open, leads to growing precautionary demand for forex reserves.

In response to the increase in forex reserves, however, unexpected impacts can

[5] International Reserves and Foreign Currency Liquidity: Guide for a Data Template (2013)
[6] Balance of Payments and International Investment Position Manual (2009)

occur in the private sector. The central bank absorbs foreign currency from the domestic foreign exchange market into forex reserves to stabilize its currency exchange rate, but it also affects liquidity of foreign currency, leading to a lack of liquidity. In the case of the lack of liquidity in the domestic market, firms or banks will be faced with troubles in financing foreign currency from the domestic market and need to borrow from abroad, leading to the increase of external debt.

Forex reserves also signify one country's economic and financial sustainability or vulnerability. Thus, a large amount of forex reserves of a country can lower the credit risk of the country and facilitate international borrowing. It also leads to the increase of external debt.

Figure 1 shows the positive co-movements between external debt and forex reserves that are consistent with the expectation above.

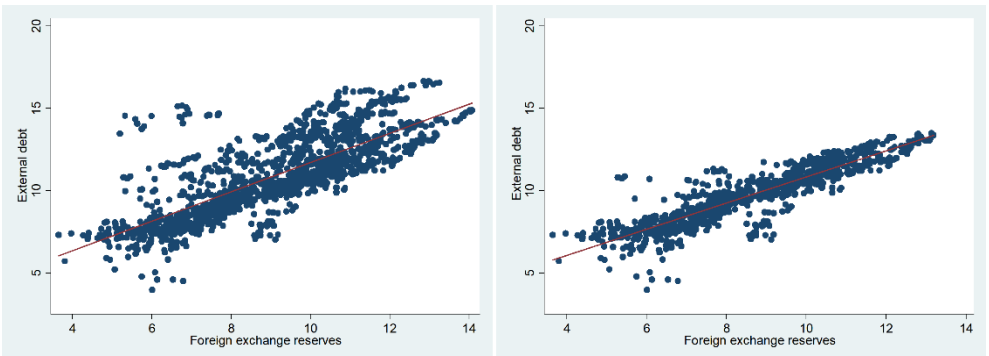

Figure 1 Correlations between External Debt and Foreign Exchange Reserves, 1998-2015
: for the whole sample countries and for developing countries respectively[7]

[7] The whole sample including reserve currency countries covers 108 countries.

3. Data and Empirical Model

The equation for panel regression analysis of this study is as follows:

$$Y_{i,t} = \beta_0 + \beta_1 X_{i,t} + u_i + \varepsilon_{i,t}$$

The dependent variable, $Y_{i,t}$, is the first difference of external debt of country i at period t. Variable $X_{i,t}$ is comprised of forex reserves and the other explanatory variables: the real interest rate gap between the domestic and the world (%), the broad money per GDP (%), the economic growth rate, the current account and the capital control indicator. Forex reserves are also used as the first difference. The capital control indicator is used as the dummy variable which indicates whether a country's restriction level is higher or lower than the average level of sample countries. If one country's restriction index is higher than the average value, the dummy variable has 1, otherwise 0.[8] u_i is country fixed effects and $\varepsilon_{i,t}$ is the error term.

The data covers 73 countries from 1998 through 2015, but unbalanced across countries. The issuers of reserve currencies are excluded in the sample countries.[9] I

[8] The higher the level of index, the more capital flows are restricted.

[9] According to the Currency Composition of Official Foreign Exchange Reserves (COFER) of the IMF, the major reserve currencies are as follows: U.S. dollars, Euros, Japanese yen, Pounds sterling, Canadian dollars, Australian dollars and Swiss francs.

use gross external debt as the dependent variable to examine the overall relationship between external debt and forex reserves in the baseline model. Then I reclassify the institutional sectors into two groups – the private and the public sector – to examine whether external debt responds to forex reserves differently by each sector. The private sector covers deposit-taking corporations except the central bank, other financial corporations and nonfinancial corporations, households, and NPISHs.[10] The public sector covers central bank and monetary authorities (where relevant) and general government. Since the nature and purpose of holding external debt are different by each sector, I expect that the results would be also different.

To ensure comparability of data for external debt across countries, I use data for liabilities from the IIP statement and calculate gross external debt by aggregating the amount of debt liabilities of each functional category: direct investment excluding equity and investment fund shares, portfolio investment excluding equity and investment fund shares, and other investment excluding other equity.

Explanatory variables are chosen based on Kim (2011) and previous studies on the international capital flows. The current account is used as the proxy for net capital flows. I also include the capital control indicator developed by Fernández et al. (2015) to control various levels of capital liberalization and capital mobility by country. Lastly, I use key macroeconomic and financial variables. The economic growth rate is calculated as the growth rate of real GDP. The U.S. real interest rate is used as the

[10] NPISHs indicates nonprofit instruction serving households.

proxy for the world variable when measuring the interest rate gap between the domestic and the world market, and the broad money is used as a share of GDP (%).

Data for external debt, forex reserves and the current account are from the Balance of Payment and the International Investment Position of the IMF. Data for the real interest rate and the broad money per GDP are from the World Bank. Data for the real GDP and the capital control indicator are from PWT 9.0 and Fernández et al. (2015) respectively. More details are in Table 2. Table A1 in the Appendix shows the summary statistics and the sample periods for each sample country.

Dependent variables	
EDP	External debt position, billion$ Source: International Investment Position (IIP)
EDP_private	External debt position by private sector, billion$ Source: International Investment Position (IIP)
EDP_public	External debt position by public sector, billion$ Source: International Investment Position (IIP)
Explanatory variables	
Reserves	Foreign exchange reserves (Reserve assets), billion$ Source: Balance of Payment (BOP)
Interest rate gap	Real interest rate gap between the domestic and the world, % Source: World Bank
Broad money	Broad money per GDP, % Source: World Bank
RGDPg	Growth rate of real GDP Source: PWT 9.0
Current account	The current account balance, billion$ Source: Balance of Payment (BOP)
Dum_ capital control	Overall restrictions index (ka) of capital control indicators Source: Fernández et al. (2015)

Table 2 List of Variables

4. Empirical Results

4.1. Panel Analysis

Table 3 reports the estimated results for gross external debt. The coefficients in regression (1) are from the pooled ordinary least squares (OLS) regression, and regression (2) – (5) report the results from panel analyses with fixed effects. In all cases, the estimated coefficients on forex reserves are positive, which are statistically significant at 1% level. Regression (3) – (5) additionally include the current account and the dummy variable for the capital control indicator: regression (3) includes the current account only, regression (4) includes the capital control indicator only, and regression (5) includes both.[11]

Although there exist differences in size, the estimates on forex reserves are robustly positive and significant at 1% level in every regression. These results support the argument that the increase of forex reserve holdings can bring about the increase of external debt.

[11] In regressions including the capital control indicator, 23 countries are excluded due to the absence of the data, thereby leading to the sample of 50 countries: Argentina, Bahrain, Bangladesh, Bolivia, Brazil, Bulgaria, Burkina Faso, Chile, Hong Kong, Colombia, Costa Rica, Czech Republic, Denmark, Ecuador, Georgia, Hungary, Iceland, India, Indonesia, Israel, South Korea, Kuwait, Kyrgyz Republic, Latvia, Malaysia, Mauritius, Mexico, Moldova, Morocco, New Zealand, Nicaragua, Nigeria, Norway, Peru, Philippines, Poland, Romania, Russian Federation, Singapore, South Africa, Sri Lanka, Swaziland, Sweden, Tanzania, Thailand, Togo, Uganda, Ukraine, Venezuela, Zambia.

The estimated coefficients on the current account are negative and statistically significant in both regression (3) and regression (5) where the estimates are -0.442 and -0.363 respectively. The negative coefficients are not surprising because the current account deficits need to be financed, and international borrowing is one way of financing the deficits. The dummy variable for the capital control indicator reports negative but insignificant results in both regression (4) and regression (5). Notwithstanding the statistical insignificance, the negative sign of coefficients still supports the intuitive interpretation that the more capital flows are restricted, the more difficult to make international lending/borrowing.

The GDP growth rate and the broad money (per GDP) report robust results in all regressions. Both variables show the positive and statistically significant coefficients. The real interest rate gap, however, have negative but insignificant estimates in all cases.

	(1)	(2)	(3)	(4)	(5)
Reserves	0.718***	0.565***	0.631***	0.390***	0.461***
	(0.0581)	(0.119)	(0.0984)	(0.112)	(0.108)
Interest rate gap	-0.125	-0.125	-0.0906	-0.204	-0.175
	(0.0853)	(0.118)	(0.0747)	(0.149)	(0.126)
Broad money	0.156***	0.350*	0.326*	0.415**	0.384**
	(0.0174)	(0.185)	(0.176)	(0.190)	(0.185)
RGDPg	65.00***	101.0**	106.1**	143.1**	148.9**
	(21.56)	(46.44)	(46.22)	(66.85)	(66.12)
Current account			-0.442***		-0.363**
			(0.128)		(0.164)
Dum_capital control				-4.264	-7.719
				(6.730)	(5.272)
Constant	-5.540***	-17.66	-15.87	-19.64	-15.64
	(1.666)	(11.63)	(11.35)	(13.63)	(13.29)
Fixed Effects	No	Yes	Yes	Yes	Yes
Observations	795	795	795	537	537
Number of country		73	73	50	50
R-squared	0.283	0.191	0.234	0.157	0.184

Table 3 Estimated Results: The Whole Sample Analysis
(*Notes:* 1) Numbers in parentheses are standard errors for Column (1) and robust standard errors for Column (2) - (5). 2)*, ** and *** indicate significance at 10%, 5% and 1% respectively.)

4.2. Subsample Analysis

I additionally analyze for the subsample which covers the developing countries only.[12] The results for subsample analyses are in Table 4. All regressions in this section include all explanatory variables like regression (5). Regression (6) reports the estimates from panel analysis using gross external debt as the dependent variable. Regression (7) and regression (8), however, present the estimated coefficients for the sectoral analysis.[13] Each regression uses external debt held by the private sector and by the public sector as the dependent variable.

In regression (6), the estimate on forex reserves is still positive and significant. The estimated coefficient for the subsample countries (0.506) is slightly larger than that for the whole sample countries (0.461). The current account still shows the negative and significant coefficient (-0.494) and the dummy variable for the capital control indicator also reports the negative but insignificant coefficient.

The interest rate gap, interestingly, has statistical significance at 10% level in the subsample analysis, while it is insignificant in the whole sample analysis. It implies that the positive interest rate gap between the domestic and the international market causes capital inflows into the developing countries, and therefore decreases the needs for international borrowing. The broad money and the GDP growth rate still have statistically significant positive coefficients.

[12] More precisely, the subsample includes developing and emerging countries.
[13] Due to the absence of data, several countries are dropped in the sectoral analysis.

Regression (7) and (8) report the estimated results for each sector analysis, and they show significantly different results for forex reserves as well as other explanatory variables. The estimated coefficients for the private sector analysis in regression (7) are similar to the those in regression (6), showing significant responses to the forex reserves as well as the financial and economic variables. However, the estimated coefficients in regression (8) have very low statistical significances, and thus hardly explain the correlation between forex reserves and external debt in the public sector.

These results imply that the increase of forex reserves has no significant impacts on external debt which is held by the public sector (the general governments and the central banks), but on external debt in the private sector (deposit-taking corporations, other financial corporations and nonfinancial corporations, households, NPISHs). Also, the differences between two sectors support the expectation that the purposes of creating external debt vary by each sector or institution, and thus external debt will respond differently to forex reserves and other variables by the sector.

	(6)	(7) Private Sector	(8) Public Sector
Reserves	0.506***	0.480***	0.00416
	(0.0415)	(0.0518)	(0.0676)
Interest rate gap	-0.155*	-0.239**	-0.116
	(0.0848)	(0.116)	(0.0992)
Broad money	0.215*	0.187	0.0419
	(0.123)	(0.124)	(0.0536)
RGDPg	42.21**	57.59**	-4.564
	(20.51)	(22.26)	(12.05)
Current account	-0.494***	-0.408***	-0.137*
	(0.125)	(0.123)	(0.0672)
Dum_capital control	-6.427	-5.526	-1.625
	(5.869)	(3.946)	(2.902)
Constant	-2.913	-4.145	1.636
	(6.570)	(7.949)	(4.083)
Fixed Effects	Yes	Yes	Yes
Observations	445	332	319
Number of country	40	32	31
R-squared	0.347	0.414	0.054

Table 4 Estimated Results: The Subsample Analysis
(*Notes:* 1) Numbers in parentheses are robust standard errors. 2)*, ** and *** indicate significance at 10%, 5% and 1% respectively.)

4.3. Robustness Check

In this section, I test robustness of the results. I change the regression model, normalizing the variable – external debt, foreign exchange reserves and the current account – as the share of GDP (%) to control the countries' level effects. Table 6 shows the results for the robustness check. Regression (9) and (10) report the estimated coefficients for the whole sample and the subsample analysis respectively, and the remaining regressions show the estimated coefficients for the sectoral analysis. The estimates on reserves (per GDP) are still positive and statistically significant in regression (9), (10) and (11), while the size of estimates increase over the original estimates. Also, as shown in regression (12), the impact of foreign exchange reserves and other variables on external debt held by the public sector are insignificant, which is consistent with the original result in the previous section. The fundamental results for foreign exchange reserves are unaltered, and thus the results are robust even after controlling the level effects of the countries.

	(9)	(10)	(11) Private	(12) Public
Reserves/GDP	0.883**	0.581***	0.587***	0.150
	(0.373)	(0.130)	(0.121)	(0.0927)
Interest rate gap	-0.172	-0.0260	-0.0359	0.0109
	(0.364)	(0.0403)	(0.0436)	(0.0497)
Broad money	-0.0425	0.0135	-0.00632	-0.00332
	(0.137)	(0.0297)	(0.0217)	(0.0168)
RGDPg	175.9**	30.60***	34.53***	0.104
	(72.89)	(9.675)	(11.00)	(7.497)
Current account/GDP	-0.974	-0.548***	-0.648***	0.00887
	(0.759)	(0.143)	(0.144)	(0.109)
Dum_capital control	-13.97	-0.922	-1.406	0.177
	(8.707)	(1.394)	(1.108)	(0.616)
Constant	7.350	0.443	1.234	0.429
	(8.906)	(1.793)	(1.438)	(1.262)
Fixed effects	Yes	Yes	Yes	Yes
Observations	537	445	332	319
Number of country	50	40	32	31
R-squared	0.037	0.184	0.340	0.014

Table 5 Robustness Check
(*Notes:* 1) Numbers in parentheses are robust standard errors. 2)*, ** and *** indicate significance at 10%, 5% and 1% respectively.)

5. Conclusion

This paper analyzes the impact of foreign exchange reserve accumulation on external debt. I find that foreign exchange reserve accumulation can cause the increase of external debt from the analysis of gross external debt. This result is robust for both whole sample countries and subsample countries. The impact of increased foreign exchange reserves is greater in the developing countries than in the whole sample countries. Among the other explanatory variables other than foreign exchange reserves, the current account and the GDP growth rate are the most significant variables in explaining changes in external debt.

The sectoral analysis which categorizes the debt holders into the private and the public sector shows that the size and significance of the impact varies across the institutional sectors. External debt in the private sector responds positively to foreign exchange reserves, which is also statistically significant. In the public sector, however, foreign exchange reserves hardly explain changes in external debt. This finding supports that increased foreign exchange reserves provide incentives to increase external debt for the private sector such as firms and banks.

However, there remains an endogeneity problem due to the reverse causality and omitted variables. As external debt grows, for example, the central bank is likely to increase foreign exchange reserve holdings as a self-insurance. Also, there exist other factors that can explain changes in external debt. It leaves potential for the

estimated results to be overestimated. Therefore, the analysis can be improved by including instrumental variables in the regression model or developing the methodology.

As foreign exchange reserves steadily and rapidly increase, economic costs of holding reserves should be considered. This study suggests one of the potential costs, and further research is needed.

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Appendix

	EDP		Reserves		Interest rate gap		Broad money		GDPg		Current account		Dummy _capital control		Sample period
	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.	mean	S.D.	
Argentina	-1.064	11.645	0.290	7.167	-1.713	10.356	27.530	2.429	0.032	0.063	0.747	7.605	0.733	0.458	1999 – 2013
Bahrain	2.333	24.130	0.291	0.598	0.089	8.111	69.870	8.060	0.050	0.020	1.464	1.151	0.000	0.000	2001 – 2013
Bangladesh	1.193	1.234	1.226	2.448	4.299	0.543	50.653	9.499	0.057	0.008	0.647	1.218	1.000	0.000	2001 - 2004, 2011 - 2014
Bolivia	-0.001	0.784	1.318	0.813	1.821	5.525	64.449	10.217	0.049	0.010	1.111	0.587	0.000	0.000	2004 – 2013
Brazil	32.791	39.714	26.912	31.303	33.804	8.566	70.427	11.634	0.037	0.022	-26.387	38.576	0.417	0.515	2002 - 2013
Bulgaria	2.783	4.993	1.122	1.879	1.896	4.069	56.441	15.411	0.031	0.042	-2.833	3.986	0.000	0.000	1999 - 2013
Burkina Faso	1.288	1.773	0.024	0.292	3.055	3.321	26.689	4.097	0.059	0.017	-0.537	0.426	1.000	0.000	2006 - 2013
Chile	6.799	6.176	1.653	4.015	0.448	5.179	73.984	10.198	0.041	0.024	-0.289	5.067	0.267	0.458	1999 - 2013
Hong Kong	57.505	78.464	16.077	21.559	3.049	3.207	289.378	41.887	0.039	0.032	17.199	8.457	0.000	0.000	2001 - 2013
Colombia	4.080	5.339	2.292	2.096	4.135	6.034	33.799	5.946	0.037	0.027	-4.414	4.367	1.000	0.000	1999 - 2013
Costa Rica	4.171	0.108	1.288	1.150	10.513	1.956	48.569	0.823	0.043	0.012	-2.421	0.014	0.000	0.000	2012 - 2013
Czech Republic	7.535	6.744	2.907	3.494	1.036	2.374	62.887	7.734	0.026	0.031	-4.095	2.091	0.000	0.000	1999 - 2013
Denmark	10.324	19.015	2.922	7.520	-0.089	1.633	50.361	2.962	0.020	0.016	3.404	1.083	0.000	0.000	1999 - 2002
Ecuador	-0.117	1.152	0.032	0.466	7.456	20.657	23.459	5.288	0.034	0.039	0.201	1.013	0.000	0.000	1999 - 2006
Georgia	0.791	0.752	0.192	0.227	9.484	5.399	21.344	8.421	0.059	0.042	-1.070	0.811	0.000	0.000	2000 - 2013

Hungary	11.693	22.034	2.478	3.660	1.369	3.099	53.032	7.055	0.020	0.030	-4.009	4.804	0.133	0.352	1999 - 2013
Iceland	6.775	14.513	0.253	1.513	5.571	2.303	72.635	22.770	0.029	0.038	-1.227	1.466	0.333	0.488	1999 - 2013
India	22.090	18.371	17.384	26.794	2.289	2.089	68.225	10.146	0.071	0.022	-22.150	29.718	1.000	0.000	1999 - 2013
Indonesia	10.170	13.930	5.948	11.294	1.637	5.378	41.122	4.034	0.055	0.007	0.265	13.289	1.000	0.000	2002 - 2013
Israel	2.725	4.977	3.936	5.711	2.159	2.258	119.420	32.540	0.038	0.025	3.571	4.149	0.000	0.000	1999 - 2013
Korea	18.130	34.177	19.863	26.861	1.164	1.455	114.325	23.745	0.049	0.027	21.690	21.338	0.400	0.507	1999 - 2013
Kuwait	-3.224	6.593	3.010	1.277	1.143	14.724	70.145	8.968	0.016	0.067	56.144	21.860	0.000	0.000	2009 - 2013
Kyrgyz Republic	0.424	0.345	0.177	0.115	10.924	7.103	26.932	5.270	0.048	0.039	-0.404	0.373	0.000	0.000	2003 - 2013
Latvia	3.832	4.850	0.427	0.798	-2.417	5.961	35.069	7.083	0.067	0.045	-2.191	2.169	0.000	0.000	1999 - 2008
Malaysia	13.012	11.935	8.730	10.562	-0.862	4.307	131.318	6.043	0.051	0.022	22.331	9.893	1.000	0.000	2002 - 2013
Mauritius	11.884	52.869	0.297	0.111	4.683	0.709	97.719	0.845	0.036	0.005	-1.036	0.366	0.000	0.000	2010 - 2013
Mexico	68.485	15.215	20.077	6.490	-0.466	1.104	46.510	1.800	0.036	0.016	-16.800	10.669	1.000	0.000	2010 - 2013
Moldova	0.339	0.303	0.179	0.203	4.115	6.845	41.739	13.462	0.044	0.046	-0.375	0.316	1.000	0.000	1999 - 2013
Morocco	0.116	1.056	2.036	2.025	8.404	1.007	86.298	5.033	0.047	0.017	1.197	0.335	1.000	0.000	2003 - 2005
New Zealand	13.060	18.198	1.277	3.133	1.403	1.926	83.180	6.407	0.025	0.021	-5.056	3.537	0.000	0.000	2001 - 2010
Nicaragua	0.859	0.165	0.041	0.079	6.073	3.123	35.213	1.955	0.048	0.004	-1.139	0.058	0.000	0.000	2012 - 2013
Nigeria	2.269	8.522	1.768	9.148	-0.223	19.309	26.551	9.136	0.060	0.011	20.923	9.167	0.000	0.000	2006 - 2013
Norway	74.228	84.774	0.426	8.743	-2.163	7.034	56.221	3.112	0.010	0.021	55.932	12.148	0.000	0.000	2006 - 2009
Peru	2.046	3.731	3.715	4.734	16.387	3.927	34.118	4.233	0.052	0.027	-1.826	2.959	0.000	0.000	1999 - 2013

Philippines	2.941	4.225	5.625	5.967	1.494	1.593	58.818	5.119	0.052	0.019	4.867	3.918	1.000	0.000	2002 - 2013
Poland	13.852	12.483	2.526	2.818	4.103	3.678	42.311	2.243	0.039	0.016	-9.440	3.677	1.000	0.000	1999 - 2006
Romania	8.310	8.650	3.101	3.330	3.054	4.269	33.532	3.873	0.034	0.042	-8.182	7.521	0.267	0.458	1999 - 2013
Russia	46.936	49.128	33.158	55.412	-6.715	8.384	37.080	11.258	0.050	0.042	59.474	27.047	0.667	0.488	1999 - 2013
Singapore	72.975	70.312	16.414	8.869	1.561	3.186	119.079	10.702	0.062	0.042	37.795	16.272	0.000	0.000	2002 - 2013
South Africa	6.681	10.305	2.947	2.838	1.489	2.058	67.878	9.389	0.033	0.018	-8.321	7.597	1.000	0.000	1999 - 2013
Sri Lanka	3.579	1.098	0.373	0.023	1.818	0.109	43.480	1.736	0.068	0.006	-3.275	1.038	1.000	0.000	2012 - 2013
Swaziland	0.027	0.108	0.027	0.123	0.818	4.631	21.238	3.333	0.027	0.011	-0.082	0.196	1.000	0.000	1999 - 2013
Sweden	46.197	43.682	1.156	2.068	-0.369	1.699	45.079	4.705	0.032	0.013	16.563	5.404	0.000	0.000	1999 - 2005
Tanzania	0.947	1.706	0.292	0.300	1.154	5.381	23.178	0.936	0.067	0.012	-2.029	1.631	1.000	0.000	2002 - 2013
Thailand	4.786	11.628	10.360	13.066	0.768	2.122	110.114	7.666	0.044	0.027	5.009	8.158	1.000	0.000	2001 - 2013
Togo	0.043	0.560	0.010	0.177	1.536	4.473	38.223	6.262	0.035	0.015	-0.224	0.049	1.000	0.000	2005 - 2012
Uganda	0.351	1.160	0.177	0.258	9.002	8.510	20.061	2.087	0.071	0.021	-0.874	0.770	0.000	0.000	2001 - 2013
Ukraine	10.140	7.671	1.444	5.786	0.729	9.050	48.399	10.043	0.035	0.069	-4.165	7.705	1.000	0.000	2002 - 2013
Venezuela	5.408	9.037	0.402	5.547	-6.366	8.473	30.006	10.173	0.029	0.075	11.805	9.751	0.400	0.507	1999 - 2013
Zambia	1.519	1.613	0.237	0.304	4.177	4.783	19.009	0.875	0.079	0.015	0.567	0.856	0.000	0.000	2007 - 2013

Table A1 Summary Statistics and Sample Periods

국문초록

본 연구는 기축통화 발행국을 제외한 73개 국가에 대하여 1998년부터 2015년까지의 연간 패널 데이터를 이용하여 외환보유고가 대외채무에 미치는 영향을 실증 분석하였다. 추정 결과 외환보유고의 증가는 대외채무에 유의한 양의 영향을 미치는 것을 확인하였다. 또한 대외채무의 차입주체를 민간과 공공부문으로 구분하여 추정한 부문별 분석을 통해 민간부문의 대외채무는 외환보유고 증가에 대하여 유의하게 반응하는 반면 공공부문이 보유한 대외채무의 반응은 유의하지 않음을 확인하였다. 이는 선행연구에서 주장한 바와 같이 향후 위기에 대비한 예비적 동기에 따라 외환보유고를 증가시키는 것이 오히려 민간 경제주체로 하여금 대외채무를 확대할 유인을 제공함을 의미한다. 이에 대해 본 연구는 두 가지 가능성을 제시하였는데 (1) 중앙은행이 시중의 외환을 외환보유고로 흡수하여 국내 외환시장에 외환유동성 부족이 발생할 경우 민간 경제주체의 외환차입에 따라 대외채무가 증가할 수 있으며, (2) 외환보유고의 확충에 따라 국가의 신용위험이 낮아질 경우 민간 경제주체의 국제차입이 용이해져 대외채무의 증가로 이어질 수 있다.

주요어: 대외채무, 외환보유고 축적, 외환유동성, 차입주체 부문별 분석
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