

T.C.
BAHÇEŞEHİR ÜNİVERSİTESİ

**SOVEREIGN AND EXTERNAL DEBT
SUSTAINABILITY DYNAMICS**

Yüksek Lisans Tezi

GÖKHAN ERMİŞ

İSTANBUL, 2014

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SOSYAL BİLİMLER ENSTİTÜSÜ

SERMAYE PİYASALARI VE FİNANS

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Tez Danışmanı: DOÇ. DR. DENİZ GÖKÇE

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DEDICATION

I thank my thesis advisor, Deniz Gökçe, for enlightening about Turkish and global economic trends and making me able to find interconnections between macro economic indicators and able to interpret these findings.

I, also, thank my manager in Akbank T.A.Ş. where I currently work, Hatice Karaduman, in enabling reading financial statements of diverse companies and transmitting this knowledge in reading the budget and external balances of the diverse countries.

ABSTRACT

SOVEREIGN AND EXTERNAL DEBT SUSTAINABILITY DYNAMICS

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Thesis Supervisor: Doç. Dr. Deniz Gökçe

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This study deals with the dynamics that determine sustainability of government and external debt. Government debt sustainability analysis requires budget balance analysis and the analysis of structure of public debt. Sustainability of public debt is determined by interest rate charged on government debt, domestic inflation rate, growth rate and primary budget balance. External debt sustainability analysis requires balance of payment analysis which involves a detailed look into the current account and capital account and a detailed look into the structure of external debt.

In this study, to discuss sustainability of both government and external debt, two main criteria has been articulated: Solvency and liquidity. A country is solvent if total of discounted value of all future balances (primary balance for sovereign debt analysis, interest excluded current account balance for external debt analysis) can cover current government or external debt. A government is liquid if this government short term receivables, one year government balance and liquid assets can compensate short term government debt. A country is liquid if reserves of this country, short term receivables and non interest current account balance are sufficient to meet short term external debt.

Besides public debt and external debt structure; international capital mobility, accessibility of public-private borrowers to domestic and international financial markets and credit rating agencies have an impact on sustainability of public and external debt.

Keywords: Debt Sustainability, Public Debt, External Debt, Solvency, Liquidity

ÖZET

SOVEREIGN AND EXTERNAL DEBT SUSTAINABILITY DYNAMICS

Gökhan Ermiş

Sosyal Bilimler Enstitüsü-Sermaye Piyasaları ve Finans

Tez Danışmanı: Doç. Dr. Deniz Gökçe

Mayıs 2014, 29 Sayfa

Bu çalışma kamu borçlarının ve dış borçların sürdürülebilirliğini belirleyen dinamikleri incelemektedir. Kamu borçlarının sürdürülebilirliği analizi, bütçe dengesinin ve kamu borç yapısının analizini gerektirmektedir. Kamu borçlarının sürdürülebilirliği, hükümet borçlarına tahakkuk eden faizle, ülkenin enflasyon oranı, büyüme oranı ve faiz dışı fazla ile tespit edilmektedir. Dış borç sürdürülebilirliği analizi ödemeler dengesi tablosunun-cari denge ve sermaye dengesinin detaylı incelenmesini ve dış borç yapısının analizini gerektirmektedir.

Bu çalışmada, hükümet borçlarının ve dış borçların sürdürülebilirliği için iki ana kriterden bahsedilmiştir. Borç ödeme gücü (solventibilite) ve likidite. Hükümetlerin borç ödeme gücü, bütün gelecek dönemdeki faiz dışı kamu dengelerinin iskontolanmış değerlerinin bugünkü borcu karşılmasını, ülkelerin dış borç ödeme gücü ise gelecek dönemdeki faiz dışı cari dengelerinin iskontolanmış değerlerinin bugünkü borcu karşılmasını belirtir. Bir hükümet, bir sene içinde elde ettiği faiz dışı fazlalar, bir sene içinde tahsil edeceği alacaklar ve hazır değerleri ile kısa vadeli borçlarını karşılayabiliyorsa, bu hükümet likittir. Bir ülke, rezervleri ve bir sene içinde meydana gelen faiz dışı cari dengesi ile kısa vadeli dış borçlarını ödeyebiliyorsa bu ülke likittir.

Kamu borcu ve dış borçların yapısının yanı sıra, uluslararası sermaye hareketliliği, kamu-özel sektör borçlularının uluslararası ve yerel finansal piyasalara ulaşım kabiliyeti ve kredi derecelendirme kuruluşlarının da hükümetlerin borçları ve ülkelerin dış borçlarının sürdürülebilirliğinde önemli etkileri vardır.

Keywords: Borç Sürdürülebilirliği, Kamu Borcu, Dış Borç, Borç Ödeme Gücü, Likidite

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ABBREVIATIONS

- ASEAN: Association of Southeast Asian Nations
- CPIA: Country Policy and Institutional Assessment
- CRA: Credit Rating Agencies
- DSA: Debt Sustainability Analysis
- EU: European Union
- FDI: Foreign Direct Investment
- FX: Foreign Exchange
- GDP: Gross Domestic Product
- GNP: Gross National Product
- HIPC: Heavily Indebted and Poor Countries
- IMF: International Monetary Fund
- IGRD: Interest-Growth Rate Differential
- LIBOR: London Interbank Offered Rate
- PBOC: People's Bank of China
- SOE: State Owned Enterprise
- TIBOR: Tokyo Interbank Offered Rate
- UK: United Kingdom
- USA: United States of America
- USD: United States Dollar
- WB: World Bank

1. INTRODUCTION

In developed countries, government debts have increased due to low growth and bailout efforts to protect banks after global financial crisis. Some banks which had weak financial structures were nationalized or recapitalized. This situation required government spending. Moreover, due to reduced production and consumption, growth rates declined and some European countries had minus growth, which resulted in contraction. This not only increased debt amount itself but also debt/GDP ratios increased rapidly.

This situation increased concerns about sustainability of sovereign and external debts not only at administrative level of governments, but also at academic level. In this thesis, the dynamics of sovereign and external debts will be discussed. Debts can be departed into two, as public (sovereign) debt and external debt.

In order to understand dynamics of public debt, the detail of government balance, which is budget balance, will be analyzed, and then composition and nature of public debt will be discussed. The interrelation of budget balance and government debt with macroeconomic data (interest rate, inflation, growth rate) will be mentioned. In this context, IMF approach to debt sustainability analysis will be criticized.

To understand the dynamics of external debt, components of external balance, which are included in balance of payment table, will be analyzed and its interrelation with external debt sustainability will be discussed. Moreover, composition and nature of external debt will be mentioned.

In addition to sovereign and external debt dynamics, other issues which involve significance of institutional mechanism to manage government debt, effects of credit rating agencies, debt limit question, relevance of domestic and international money markets on sovereign and external debt sustainability, relation between external debt sustainability and international capital flows and models that are used in debt sustainability analysis will be briefly analyzed.

2. LITERATURE REVIEW

In this area, Morris Goldstein, in the article “Debt Sustainability, Brasil and the IMF”, mentions about shortcomings of IMF approach in analysing external debt sustainability of emerging economies. Then, by pointing high interest rates and low growth are problems for debt sustainability for Brasil. Moreover, for Lula Government, he calculates 5,25 percent primary surplus to sustain repayment of government debt, to grant Banc Central do Brasil operational independency and make effort to negotiate trade arrangements to increase trade openness (Goldstein, 2003, pg: 25)

Yılmaz Akyüz, in his article, “Debt Sustainability in Emerging Markets: A Critical Appraisal” makes some criticisms about solvency criteria and debt limit question. He argues that due to future uncertainties to correctly estimate future cash flows and neglecting a country’s socio-economic structure, assessing solvency criteria in debt sustainability analysis is problematic. Another criticism is that IMF focuses primarily on payment of government debt without taking proper account in its policy recommendations of financial instabilities and effects of business cycles on sovereign and external debt sustainability (Akyüz, 2010, pg: 37)

Nouriel Roubini, In his article of “Debt Sustainability: How to Assess Whether a Country is Insolvent”, makes some conclusions that according to solvency criterion, debt to GDP ratio or debt to any indicator that shows payment capacity (export or government ratio) should not increase continuously in a time horizon. Moreover, he argues that, trade gap-fiscal gap should be estimated in whether a country’s government or external debt is sustainable, and whether a debt relief-reduction may be suitable. Another point he captures is that implicit tax on domestic investment to pay back debt may create a “debt overhang” which will result in reduction in incentives to invest and to build capital. Lastly, increases in sovereign spreads may decrease the capacity of a country to pay its debts which may result in unsustainable debt situation even if economic indicators and economic policy of the government are sound (Roubini, 2001, pg: 2).

In “Analysing Government Debt Sustainability in the Euro Area” released by ECB Monthly Bulletin – April 2012, it is mentioned that after global financial crisis in 2008, debt ratios increased and this was combined with sovereign government bond yield spreads vis-à-vis Germany. Due to cyclical downturn and fiscal stimulus programs, USA debt ratio increased from 65 percent to 95 percent between 2007 and 2011 and in Japan it increased from 190 percent to 220 percent. After these introduction, static conventional debt analysis’ equation is mentioned which involve interest growth rate differential and primary balance. Then it argues that this equation involves gross debt, not net debt (financial assets excluded gross debt) and so

they should be included into equation. However, it is also argued that state owned enterprises may not be sold to high price in weak economic conditions. Then, a projection for debt/GDP ratio for Euro area is made and according to baseline scenario debt/GDP will be between 85-90 percent. Moreover, it is argued that classical debt sustainability analysis does not capture interdependencies between interest rate, growth rate and primary surplus, so, to capture these interdependencies, correlation of shocks, fiscal responses and future uncertainties, dynamic stochastic general equilibrium models and fan chart approach will be suitable for debt sustainability analysis. (ECB, April 112, pg: 66)

Atish R. Gosh, Jun I. Kim, Enrique G. Mendoza, Jonathan D. Ostry and Hamvash S Qureshi, in the article “Fiscal Fatigue, Fiscal Space and Debt Sustainability in Advanced Economics” makes a mathematical and statistical analysis and looking at the diverse indicators (output gap, inflation, trade openness, oil price etc.) they argue that there are diverse debt limits for diverse Eurozone countries and developed countries, which ranges between 150-250 percent. Moreover, article mentions about the concept of fiscal space to reach maximum sustainable debt ratio and analysis finds that there is limited fiscal space for Greece, Iceland, Italy, Japan and Portugal. There is enough fiscal space for Austria, Korea and Nordic Countries. (Gosh, Kim, Mendoza, Ostry, Qureshi, 2011, pg: 34)

Markus Eller and Jarmila Urvova in the article “How Sustainable are Public Debt Levels in Emerging Europe” makes a stochastic analysis for four Eastern European Countries; Czech Republic, Hungary, Poland and Slovakia. For these countries, fan charts for five scenarios are baseline scenarios (which is not very much different than traditional DSA approach of IMF), no reaction to output gap scenario, no reaction to debt scenario, stronger reaction to debt scenario and stability and convergence program target scenario. (Eller, Urvova, 2012, pg: 63-67). However, Eller and Urvova has some criticisms to stochastic analysis, that this analysis does not solve the problem of availability of data in emerging markets. Stochastic analysis is conducted on the assumption that fiscal shocks are drawn from normal distribution while, in reality, shocks are distributed asymmetrically. Moreover, effects of fiscal responses on a countries data (such as fiscal multipliers) are not taken into account. (Eller, Urvova, 2012, pg: 68-69)

Eduardo Ley, staff of Economic Policy and Debt Department in World Bank, gives in the article of “Fiscal (and External) Sustainability” the details and logic of the debt sustainability equation. He mathematically identifies government budget constraint, amortization of debt, issuance of new debt. Then, he reaches an inter-temporal debt level formula, by which identify a policy to reach a target debt ratio can be conducted and debt stabilizing primary balance level can be determined. Moreover, by taking foreign currency denominated debt and exchange rate

movements into account, he calculates effective interest rate level on total government debt. Then, he creates similar mathematical equation by using foreign interest-inflation rate and interest excluded current account. However, he admits that debt stock neglects contingent liabilities and private debt can turn into public debt in systemic banking crisis via nationalizing banks which has weak financial structures. (Ley, 2010, pg: 2-12).

Henning Bohn, in the Book “Sustainability of Public Debt” edited by Reinhart Neck and Jan-Egbert Sturm, assesses the sustainability of USA public debt via using an econometric model and finds that between 1979 and 2003, growth effect in USA has covered entire interest payments on USA public debt. (Neck, Sturm 2008; pg: 45). Other writers in this book evaluate sustainability of public debt of Italy, Netherland, UK, Denmark and other Western European Countries.

Marcus Arruda, in the book “External Debt: Brasil and International Financial Crisis” (2000) makes a critical approach to IMF and neo-liberal approach to crisis. Arruda firstly analyzes the details of debt crisis of Brasil and gives a preliminary explanation of nature of external debt between pg 5-22. Then the impact of adjustment project on the economy and society of Brasil is articulated. This book gives a clear understanding of in which circumstances external debt’s sustainability gets problematic.

Jason Manolopoulos, in his book “Greece’s Odious Debt: The Looting of Hellenic Republic by the Euro, the Political Elite and the Investment Community” paces the trajectory of the current debt crisis of Greece. At first, he makes a comparison between Argentina’s and Greece’s economic and political history and he argues that a combination of oligarchical business structure, an undiversified economic system, economic and political corruption and risk appetite of international investors in liquidity boom that lasted until 2008, resulted in debt crisis in Greece. This book, despite its non-mathematical explanations, gives an intuition about the dynamics of public debt sustainability.

3. DEBT SUSTAINABILITY

2008 Global financial crisis which burst out due to the inability of subprime mortgage debtors to pay their debts (combined with utilization of Mortgage Backed Securities to create derivative instruments) influenced the macroeconomic indicators of each developed and emerging countries. Financial institutions in developed countries, including Lehman Brothers, AIG, Fannie Mae, Freddie Mac and Merrill Lynch became bankrupt or were bailout by government intervention. In 2008 and 2009, due to increased unemployment, decreased demand and reduction in global liquidity, international trade came down. This situation affected Europe via financial markets. Asian markets were not drastically involved in derivative and toxic instruments as much as European markets did, however, Asian markets were influenced via international trade.

Reduction in global private demand meant reduction in growth rate or minus growth. In developed countries, governments were not able to raise their tax revenues because of minus growth, moreover, due to effects of automatic stabilizers (increased unemployment benefit expenses) government expenditures increased. Moreover, bailouts of banks required government expenditure. In Asian states, the effects of automatic stabilizers were limited due to less coverage with respect to European counterparts, but, governments have to increase domestic demand via government expenditures.

In short, government expenditures resulted in increased government deficits and increased level of public debt. Rising government debt, especially in Greece, Ireland and Portugal, turned into a debt crisis, because there were difficulties in paying back these debts. Greece, in 2010 demanded financial aid from IMF and EU, and then Standard and Poor's decreased credit rating of Greece into junk bond-default.

The rapid increase in public debts in unstable economic conditions created questions in minds about how to assess the pay-ability of government debts and how to understand when a government debt becomes unsustainable. (Eller, Urvova, 2012, pg: 48). The answer requires a comprehensive study of macroeconomic indicators of diverse countries in general and micro level detailed analysis in particular. In order to understand the nature of sustainability of debts, its definition and logic should be described.

Debt sustainability analysis is a type of analysis which estimates the ability of a country to pay back its external debt or ability of a government to pay its government debt. In a time snapshot, if a country is not able to pay mature debts with its income, liquid or predetermined assets and if

mature debt is not able to be rolled over via refinancing, debt is called unsustainable. In this approach, government debt has to be paid in any point in payment times, and for this reason, government has to be solvent and liquid. (Eller, Urvova, 2012, pg: 49). Another approach for debt sustainability, which is adopted by IMF, is that is that if a country cannot pay its debt without major correction in income-expenditure and in macroeconomic indicators, this debt is unsustainable. (IMF, 2002, pg: 5; Compendium on Debt Sustainability and Development, 2009, pg: 3)

How can sustainability of a public debt be understood? In order to understand sustainability of a debt, two criteria is generally be taken into account. First criterion is solvency criterion in which debt sustainability analysis is conducted basically by discounting future flows of unit of analysis (central government or a country as a whole) to today and compares it with today's debt. If discounted-projected future primary surpluses (current surpluses or non-debt creating FDI inflows) are equal-greater than current government debt (country's external debt), this debt is sustainable and government-country is assumed to be solvent. In external debt analysis it can be read that if future current surpluses are sufficient to cover external debt amortizations, external debt is sustainable. (Compendium on Debt Sustainability and Development, 2009, pg: 3)

Second criterion is liquidity criterion and it is analyzed that if country or government is able to meet its short term obligations by using short term inflows, liquid assets and by maintaining access to financial markets (ECB, April 2012, pg: 60). A country might be solvent, but if it does not have significant liquid assets, short term obligations may not be met and debt can be assumed as unsustainable. In this analysis, not only future inflows of country, but also liquid assets and assets which are in portfolio of privatization (to be privatized in one year) should be taken into account. While analyzing government debt, liquid assets are not able to be estimated clearly, because, government has the capacity to marketize a public lands or enterprises and get government revenue, and has a potential to get seigniorage revenue. (These are related to the marketability of public ownership and legal status of central banks). But, in analyzing external debt of countries, reserves of country-receivables of which maturity is less than one year and value of state owned enterprises can be assessed as liquid assets and they can be used in debt sustainability calculations. For instance, China reported 47 percent gross debt ratio, while government of China had deposits that is equal to 15,3 percent of GDP in PBOC and other commercial banks and value of SOE's is equal to 50 percent of GDP (Compendium on Debt Sustainability and Development, 2009, pg: 131). Despite hidden liabilities analyzed by Richard

Hemming, he concludes that these assets are additional cushion for sustainable debt management.

3.1 THE RELATION OF DEBT SUSTAINABILITY WITH ECONOMIC DATA

In order to analyze debt sustainability, debt have to be departed into two. Initially, the dynamics of public debt will be analyzed, and then, integral parts of external debt will be discussed.

3.2 PUBLIC DEBT ANALYSIS

Public debt has a relation with budget balance. If budget has a surplus, the amount of government debt declines and vice versa. So, we have to look at the details of budget balance.

3.2.1 Budget Balance Analysis

Total government revenues have basically two types of income: tax income and non-tax income. Tax income can be divided into mainly three: Tax from personal income, tax from consumption and tax from assets of citizens. Non tax income is composed of grants, domestic-foreign aids, rent income, oil income, seignorage, revenue of SOE's etc.

Total government expenditures have mainly two types of expenses: Interest expenses and non-interest expenses. Non-interest expenses are mainly composed of personnel expenses, transfer expenses (excluding interest; pension, unemployment and health expenses) and government investment expenses.

A detailed look in government revenue and government expenditure is important in estimating the elasticity of expenses-revenues and the multiplier and accelerator effects of these expenditures. Moreover, this analysis is crucial in order to understand the dynamics-causes of budget deficit and to prepare a strategy to reduce budget deficit or create budget surplus. Government debt sustainability requires a sustainable revenue infrastructure; if government revenues are heavily relied on one off incomes, sustainability of public debt becomes problematic.

A government may have a significant SOE profits in one year budget constraint. Besides tax income, SOE profits become an important additional income for budget. However, if these incomes are sensitive to business cycles, in downward business cycles, SOE incomes may be exposed to substantial drop and this situation may make government face a substantial debt crisis.

Another issue in budget and business cycle is automatic stabilizers. Automatic stabilizers are fiscal policy instruments which lessen the waves of business cycles and reduce negative effects of recession. These instruments are composed of increased rate income tax tariff, unemployment benefits and agricultural subsidies. In downturn business cycle, due to increased unemployment, government expenses increase and besides lower tax revenue, government budget deficits increases. (Ferrarini, Jha, Ramayandi, 2012, pg: 17)

Government expenses elasticity in the budget is another topic in debt accumulation. Personnel expenses, pension and unemployment benefits and government investment expenditures which have maturity more than 1 year to be completed are expenditures which are not able to be avoided, so these expenses have inelastic feature. If such kind of expenses composes an important portion of budget, budget becomes inelastic and in business cycles, government budget deteriorates more.

Moreover, governments' pension expenses might compose a striking portion of budget due to early retirement regulations. If there is a significant imbalance between life expectancy of people (statistically calculated) and retirement age, it might distort budget balance and it may result in increased budget deficits. According to the analysis that is conducted by Thierry Chauveau and Rahim Loufu, youth dependency ratio will be stable and old dependency ratio will increase in developed countries (Canada, France, Germany, Italy, Japan, UK, and USA) which will be combined with marked slowdown of growth (Broer, Lassaia, 1997, pg: 68). Under these findings, it can be concluded that developed countries might have problems of rising debt ratios, due to increased pension expenditures and low growth.

Another important part of government debt sustainability is the tax base and tax system of a country. If there are areas that are taxable (or under-taxed), tax base of a country can be increased without having much tax expenditure. Moreover, there may be tax arrears and evasions. If fiscal inspection and audit is done more effectively, tax base and tax revenue can be increased without changing the tax rates. If there is a large informal economy which is not able to be registered and taxed effectively, tax base may not be enlarged which is problematic in sustainability of public debt. For instance, despite being members of EU, in Greece, Italy, Spain and Portugal, there is a large informal economy which makes tax collection problematic (Contessi, 2012, pg: 198), and currently, they face dramatic debt sustainability problems.

In order for a country to pay back debt without any arrears of principals or any moratorium, government should have a budget surplus. Indeed, in mathematical calculations, primary balance is taken into account. In analysis made by diverse academicians and official institutions

(IMF, WB, ADB), it can be seen that although a country has a budget deficit, if it has a sufficient primary surplus, debt of this government can be sustainable.

3.2.2 Macroeconomic Data Utilization In Debt Sustainability Analysis

In order to analyze the ability of government debts to be paid, not only current tax revenue-expenses but also the growth of tax base and domestic economy should be taken into account. Historical and projected growth rates are important in estimating potential increase in tax revenue that is a primary source to pay government debts. Moreover, the more real growth a country experiences, the less debt ratio the government faces.

Another macroeconomic data that should be used in debt sustainability analysis is the interest rate that is accrued on government debt. The more interest rate a government faces, the longer the period public debt is being paid (if it is sustainable). If interest expenses are not covered by tax or grant incomes, it can be assumed as unsustainable.

In this context, interest on government debt is not sufficient to be taken directly into analysis. In order to utilize interest rate on government debt, it should be cleared from inflation rate. Inflation rate does not only reduce real value of government debt, but also decrease real interest rate.¹ Via using Fisher equation, real interest rate can be derived and it can be used in the analysis.

According to the mathematical calculation made by Reinhard Neck and Jan-Egbert, debt ratio will rise to upper levels if real interest rate exceeds real GDP growth unless there is sufficient primary surplus (Neck, Egbert, 2008, pg: 7). However, if a county has a negative interest-growth rate differential (IGRD) in which real growth rate is greater than real interest rate, debt ratio tends to fall (unless primary deficit exceeds a certain level) and sufficiently large negative difference between interest and growth erodes debt ratio. (Ferrarini, Jha, Ramayandi, 2012, pg: 63)

3.2.3 Composition And Nature Of Public Debt

Another detailed look should be oriented at the dynamics of government debt.

Debts can be either to official creditor, central bank of the country, private creditors or people. Borrowing from central bank may have lower interest cost, due to the fact that borrowing from

¹ Fisher equation is important to remember how to derive real interest rate: $(1+i)/(1+inf)=(1+r)$ where i shows nominal interest rate, inf shows inflation and r shows real interest rate.

central bank increases monetary base and reduces interest rates. However, it increases inflation (which has a potential to inflate away public debt²) and after a certain inflation rate, it may disrupt both economic activities and expectations of private sector and real balance of collected taxes may decline (Tanzi effect). Borrowing directly from people may also be less interest costly; however, operational expenses might have important cost that may have potentials to exceed interest costs of borrowings from other sources. Private creditors consist of local and international banks and financial institutions. Local creditors lend government in terms of local and foreign exchange and international creditors lend government in terms of foreign exchange. These borrowings have interest cost. If domestic interest rate is lower than interest rate that international finance involves, government tend to borrow from domestic creditors, however, if international finance interest rate is lower than domestic interest rate, governments tend to apply to international borrowing. International creditors add risk premium on the most trusted governments' interest rate (in real world, they are USA and Germany) and this risk premium involves political risks of government and economic risk like financial, liquidity, maturity and default risks. Official creditors are governments and international organizations like IMF, WB. IMF gives short term loans and IMF loans' main function is to help states which have significant current account imbalances. WB gives long term development loans. Official loans are not only given for development purposes and cures against current account imbalances, but also given for recovering unsustainability of a government debt. In this kind of debt relation, pre-debt is refinanced by new official debt and interest rates are lower than debts which are given by private creditors. HIPC initiative has been formed for this purpose. If net present value of debt of a highly indebted and poor country (HIPC) is below 35 percent of nominal amount of debt, it is called concessional debt. (IMF Staff Country Reports, September 2003, pg: 72)

Debts can be in terms of local or foreign currency or both. In emerging countries, local interest rates are generally higher than interest rates of foreign borrowing, therefore, these countries-governments are intended to borrow from outside. Borrowing in terms of local currency may have more interest cost, however, there is not a currency mismatch, because revenues are also in terms of local currency. However, borrowing in terms of foreign currency involves currency mismatch. If due to a significant current account crisis, market exchange rates move up drastically and if portion of external debt in government debt is high, government revenues may not be sufficient to cover currency losses which results in unsustainable government debt situation. In highly indebted poor countries, public debt was identified with external public

² In a monetary union, inflating away debt with money printing is out of option, due to the fact that governments do not have any control over supranational monetary agency. Greece does not have this option to pay its debt via money printing, because Greece in Eurozone area, which uses Euro and ECB is only agent to print Euro.

borrowing by IMF and WB; however, in emerging countries, this identity is lessened due to external private borrowing. (Akyüz, 2010, pg: 1)

Government debt can be divided into fixed interest rate and debt with floating interest rate. Generally, debts with floating interest rates involve a risk premium as a fixed part and a variable part, like LIBOR and TIBOR. If variable interest part is corrected upward significantly, government's weighted average cost of borrowing gets higher and this may add extra burden on government budget. However, it should be noted that, LIBOR and TIBOR are interest rates of which they are charged to most trusted customers in international markets, so, they are low. Moreover, as long as countries in which these interest rates are determined do not require significant macroeconomic corrections due to a crisis, these rates are kept stable. However, it should be noted that an increase in LIBOR and TIBOR increases interest payments of borrowing countries.

Maturity structure of government debt is also important. Debts of which maturity is less than one year are short term debts, while debts of which maturity is greater than 1 year can be classified as long term debt. This is important in determining liquidity constraints and elasticity of government budget to service this short term debt. If primary balance plus liquid assets (including government fixed assets which are in the portfolio of privatization and they are to be privatized in 1 year) can compensate short term debts, it means that debt is serviceable and it is sustainable. However, if primary balance and liquid assets are not sufficient to compensate short term debt, it is unsustainable in terms of liquidity.

If significant portion of government debt is in terms of local currency and if government has problems in servicing debt with revenues and liquid assets, government may apply to borrow long term from central bank, which means seigniorage revenue for government. Government can pay its short term debt; however, this policy has some negative implications. Monetary expansion creates inflation and this may reduce real return of creditors (even they may have negative real return because real balance of debt gets smaller) and this situation may result in loss of confidence to government. In following treasury auctions, due to the effects of adding inflation on the required-demanded real interest rate and loss of confidence to government, treasury may borrow from higher nominal interest rates. Moreover, this loss of confidence to government may create problems in borrowing of treasury, because, no financial institution want to lend government due to risk that lended loan may be evaporated due to further monetary expansion. Inflation indexed bonds came out of this kind of problems. Inflation indexed bonds are revalued in certain dates and monetary expansion does not have any impact on indexed bonds.

Besides component of debt structure, debt management strategies, and tools for debt management are important. The weights of local currency-foreign currency debt and fixed-variable interest rate determine the risks and risk management tactics of government debt. If foreign currency debt has a significant part in government debt, treasury managers may use forward-future instruments to hedge the FX debt and limit the payment of FX installments in terms of local currency. If debt with variable interest rate composes important part of total government debt, treasury managers may use interest futures in order to fix interest payment. However, all these operations should be done with a detailed risk and cost analysis.

Up to now, details of debt and budget have been mentioned. But, in order to assess the debt sustainability, the relation between debt, revenues and expenses and the relation of these three with general economic indicators should be expressed.

Mentioned above, to sustain solvency condition (no Ponzi game condition), discounted amounts of government's net operational inflows should at least be equal to current government debt. Due to they are discounted by interest rate, current and future interest expenses-incomes should be excluded. Therefore, amount of primary balance (operational balance), rather than budget balance, gets attention.

Moreover, level of domestic and foreign interest rates is important, since weighted average of these interest rates will be used in discounting future operational balances. The more weighted average of interest rates are higher, the less discounted primary surpluses will be (Weighted average of interest rates can be calculated by total interest payments (foreign public debt interest plus domestic public debt) over total public debt) and the more time interval total public debt is apt to fall down.

In order to estimate level of weighted average effective interest rate, depreciation rate of foreign exchange should be taken into account. Depreciation in foreign exchange increases the value of installments to be paid in maturity and it is a kind of financial expense for government.

Ratio of public debt is inversely related with growth rate of a country. The more a country grows, the more consumption and employment there will be and the more income and consumption tax revenue government will collect. So, growth rate is an important factor to assess debt sustainability.

Another important point in public debt sustainability is the rollover ratio of debts. If some portion of debt is able to be refinanced, this positively influences the liquidity condition of debt. However, rolling over debt may demand more interest and unless global-local interest rates are

in down trend, refinancing debt increases weighted average of interest rate and this may shows problems in sustainability of public debt (due to interest-growth rate differential increases) and in order to stabilize debt ratio, more primary surplus amount may be required. In this situation postponing of interest and principle payment should be regarded as financing debt via new debt.

3.2.4 IMF Approach To Debt Sustainability Analysis And Shortcomings

In conventional debt sustainability analysis that IMF uses in its DSA template, debt sustainability analysis is done by focusing generally on primary balance and debt as a ratio with respect to GDP and real interest and growth rates. However, this approach has some shortcomings.

Firstly, too much attention on the public debt assessment may be problematic if fragilities of private sector are ignored, because some private sector debts have potential to be turned into public debt. Bailout policies to recapitalize highly leveraged banks in crisis times and insurance on individual deposits may require more government deficits which can into higher public debt ratios. Asian financial crisis in 1997-1998 which started from private sector's foreign exchange problems resulted in increased budget deficits (Goldstein, 2003, pg: 9). Moreover, central government debt does not include guarantees of government to private sector projects and borrowings (off balance sheet liabilities). Another type of implicit liabilities is debts of local government units (municipalities) and debts of state owned enterprises (SOE's). Classical debt sustainability analysis does not take such kind of implicit debts into account; however, under certain conditions (especially in crisis times) they emerge as liquid debt. In order to asses debt sustainability of a government, government assets (which can be marketable) and implicit government liabilities (individual deposits in banks, potential recapitalization requirements, treasury guaranteed infrastructure projects and borrowings and debts of SOE's and municipalities) should be taken into account.

Classical debt sustainability analysis gets gross public debt amount (ratio) as a starting point in analysis. But, there are some government assets by which some debts can be paid back. For instance, there are accumulated amount of government assets in social security system, or there are reserves in central banks of the country. According to the liquidity of these assets, they can be used in debt amortization; however, classical debt sustainability analysis does not take these assets into account.

Another shortcoming of IMF approach is the ignorance of negative effects of fiscal policy tightening over growth rate. IMF's approach to debt sustainability analysis is that in order to be

able to pay back government debts, a government should create primary surplus. Despite its mathematical trueness, IMF framework does not tell about how to possess a primary surplus without decreasing domestic demand and without reducing growth and this approach has a potential to slowdown economy. Even if primary surplus is created, due to reduced growth, interest growth rate differential may narrow and contrary to wishes, debt may be unsustainable (Goldstein, 2003, pg: 10).

Moreover, standard DSA formula does not answer the question how to change macroeconomic indicators that affect debt sustainability like interest rate, exchange rate and growth rate (Goldstein, 2003, pg: 11). Although central bank can control short term interest rate, long term interest rates are determined in financial markets (demand and supply) and there are millions of people that affect these variables and interest rate cannot be decreased quickly. Exchange rate appreciation makes government's debt more manageable due to decrease of debt in terms of local currency, however, if this country has problems with foreign exchange reserves and serious current account problems, appreciation of local currency may further deteriorate current account and reserves of country may decline rapidly. In this situation exchange rate revaluation or appreciation may not be a feasible option to make debt sustainable.

Sometimes, governments' debts seem to be in terms of local currency. However, debts which are to be paid in terms of local currency, does not necessarily mean that they do not have currency risk. Some portion of local currency debt can be indexed to a foreign currency. An upward adjustment in currency results in increase in debt amount. However, if a country does not give sufficient about currency indexed debt, debt sustainability analysis that is conducted according to formula that IMF uses may result in wrong deductions.

Lastly, IMF debt sustainable baseline projections are criticized as overtly optimistic rather than realistic.

3.3 EXTERNAL DEBT SUSTAINABILITY

External debt has a relation with current balance. If current account has a surplus, the amount of external debt declines and vice versa. So, we have to look at the details of current balance.

3.3.1 External Balance Analysis

External balance is mainly composed of two main parts; flow items and change in stock items. It can be formulized that current balance table is a composition of income statement of a company (flow items) and cash flow statement (change in stock items).

Current account is mostly weighted by export and import. The differential of this items compose trade balance. Next part of current account involves service inflow-outflows (especially tourism), interest income-expense, construction revenues and other inflows-transfers. Trade balance plus service and income balances composes current balance.

A detailed look into the composition of current account balance is important in determining whether exports are sustainable, resistant to seasonal shocks, and whether imports are temporary or permanent. Here, elasticity of imports and exports and trends in other inflows and outflows gets attention. If certain goods compose a weighted portion of exports, foreign exchange inflows are not elastic in terms of terms of trade. If terms of trade in this good have gone worse, foreign exchange inflow will drop drastically. Same analysis can be implemented in imports, too. An increase in international prices of a good that composes a great portion of imports may result in a dramatic outflow of foreign exchange.

Elasticity of trade balance is not only determined by concentration of certain goods in total volume of exports and imports, but also the substitubility of import and export items. If a country's export goods which are crucial for a country to receive significant amount of foreign exchange has a lot of substitute goods globally, in a decrease in the price of substitute good, terms of trade will tend to decline due to reduction in global demand to export good and country will face a reduction in foreign exchange inflow. Conversely, a drastic rise in price of a good which does not have appropriate substitute goods in external markets results in important foreign exchange outflow. Oil crisis in 1973 resulted in foreign exchange crisis in developing countries, and even developed countries had suffered from rising oil prices.

Moreover, export goods and certain service incomes have seasonal features. Some agricultural products and tourism revenues involve this seasonality. If in ripening times weather is not suitable for agricultural products, export revenue of these goods will decline. Moreover, if in summer, temperature is far below the seasonal averages, tourism revenues may decline significantly. If country is dependent heavily on income that is vulnerable to seasonal shocks, these incomes have the potential to evaporate in shock times, which means that these incomes are not sustainable.

Type of goods that are imported is also important in current account analysis. If current account seems to be negative due to imported capital goods and intermediary goods which are used in export industries, it may have an effect on future export growth which may narrow trade deficit; even it may turn into a trade surplus. In order to understand the effectiveness of imported goods, the productivity of imported capital goods and export volume that is created by marginal imports should be estimated. If none of imported capital goods are operated for outside markets, current account balance will not recover without major correction in macroeconomic indicators.

“Change in Stock” item of the balance of payment table is capital account balance. This part is related to the money inflows and outflows which occurs from financial transactions, not trade transactions. Financial inflows and outflows are mainly composed of four parts: foreign direct investment, portfolio investment (stocks and treasury-corporate bonds), borrowings and changes in reserves. For countries which have a current surplus, capital account shows the utilization of foreign exchange while for countries which have a current deficit, capital account shows the financing source of current deficit.

Foreign direct investment is a long term capital inflow, because foreign investor brings productive equipment's and new technology, of which dismantling of them for foreign investor would be costly. This has a potential to increase productivity and employment within the country. Moreover, incoming capital does not create debt for government and domestic private sector. So, financing current account deficit with FDIs is least problematic in alternative sources.

Portfolio investments are composed of investments in stock and bond markets. Investing in stock markets does not create debt for both government and private sector, while investments of foreigners on government and corporate bonds may increase government or private sector liability (if foreigners buys bond in secondary financial markets, this operation does not result in increase in government-private sector debt). However, foreign investors can quickly sell these stocks and bonds and fly out of the borders of country if stocks-bonds that foreign investors possess are liquid securities (having more transaction volume and financial strength of underlying company), so financing current deficit with portfolio investments has the potential to create problems in paying external debts.

Borrowing can be conducted by private sector, treasury or central bank from both official (governments and international organizations) organizations and financial markets. Unless borrowing is long term, financing current deficit by borrowing will create problems.

Current account deficit can be financed lastly by asset sales (reduction in reserves). If reserves are in down trend due to insufficient money inflows via 3 types of finance sources, it may signal problems in sustaining external balance without a major change in economic indicators.

It should be noted that there is an integral part of current account deficit: Net errors and omissions. These are foreign exchanges of which its source is not known in diverse bank accounts. Feature of these funds are not determined (whether they are money that is acquired as an income or not), hence, they are classified as net errors and omissions.

3.3.2 Composition And Nature Of External Debt

External debts are generally paid in foreign currency, not in local currencies. Unless local currency is not a currency that is accepted worldwide, seignorage does not help a country to pay external debt. For USA, of which currency is admissible worldwide, USA does not have to accumulate reserves, and in order to pay debts to foreign institution, it has the authority to pay external debts via printing USD. However, emerging countries does not have the right to print foreign exchange and this situation makes emerging countries to be dependent on capital flows and foreign trade balances, by which these countries can only increase their foreign exchange reserves.

In analyzing government debt, it was mentioned that increase in domestic inflation reduces the real balance of government debt. In external debt analysis, inflation in creditor countries involves relevance. If inflation in creditor countries is greater than expected inflation, real value of debt declines, and value of exports tend to increase and debt for debtor country becomes sustainable. (However, if external inflation is caused by goods that are imported, this may deteriorate external debt sustainability.)

Government debt is managed by a monolithic institution, like treasury, or, by several institutions coordinated by government, like treasury and tax authority. However, external debts can be owed by governments or private sector or commercial-development banks to official institutions and private creditors. So, management of external debt is conducted by more than one authority - given that there is perfect capital mobility. Due to the fact that there are a lot of market players who have to manage debt via borrowing or amortization of debt and using derivative instruments to hedge FX or interest risks, controlling external debt is not so easy (compared to government debt).

The productivity of imported physical capital and orientation of products that are produced by these equipments towards export markets are important in debt sustainability. If machines that are imported are not oriented towards sectors which earns income in terms of foreign exchange and if imported goods are used in sectors which earns money in terms of local currency, external debt sustainability may be problematic.

In undeveloped countries in which there is low penetration into the global financial markets and in which there is not significant amount of FDI, focusing on government and private external debts in order to make debt sustainability analysis is appropriate. However, in developed countries of which currency is not accepted globally (but accepted regionally) and in emerging countries of which financial markets are integrated to global financial system and they have significant amount of FDI, focusing directly on external debt can be problematic. External debts may be paid by foreign exchange that is attracted by issued treasury bonds in terms of local currency. Apparently, external debt has declined; however, foreign investors have a claim over the assets of the country. These securities can be liquidated and converted into FX (with its accumulated interest) and they can go out of the borders of the country. This situation shows us that focusing only on debts that are in terms of foreign exchange is problematic.

As mentioned above, flow part of external balance is reflected in current account table. External debts that are supposed to be in terms of foreign exchange partially compose stock part of external balance. However, in order to fully comprehend the amount of foreign liabilities, international investment position should be analyzed.

International investment position is composed of assets of a country in terms of foreign exchange and liabilities of the country (government and private sector). Reserves in terms of foreign exchange, credits that are lended to governments, central banks and private sector-including banks outside, subsidiaries of domestic private sector outside and stocks of foreign companies (quoted to stock markets like Dow Jones and Nasdaq) that are acquired by local investors involve in asset side of the international investment position. Foreign direct investments, portfolio investments that foreigners invest on government debt securities and stocks in stock markets, borrowings from official organizations and international financial markets and commercial liabilities that are resulted from purchase of intermediary and capital goods compose liability side of international investment position. The more negative net investment position there is, the more income demand from the country. Investors which have FDI ownership and stock investors claim dividend revenues to be transferred to home country, while creditors and government-corporate debt security owners claim interest revenues. If liability side of international investment position is weighted by FDIs and long term

borrowings, in short term, there is a limited risk of foreign capital owners to get out of the borders of the country, however, if in liability side of the international investment position, portfolio capital has a significant weight, risk of fly away of foreign capital is very high. If this risk is realized, reserves of the country will drop dramatically. Portfolio investors are very sensitive to exchange, interest and inflation data and political instability. If there are economic and political instabilities in a country, portfolio investments come in and get out of the country very quickly which further disrupts macroeconomic indicators.

International investment position, therefore, does not only show us external debts, but also shows us other liabilities that are in terms of FX. In order to assess external debt, other kind of FX liabilities (FDI inflows and portfolio investments) should be taken into account.

There are four ways for external debts to be paid: Creating trade surplus and non interest current surplus, attracting foreign capital (non-debt creating FDI's), attracting pension funds via stocks and bonds and using reserves (asset sale). Here, solvency and liquidity criteria should be sustained in order to mention debt sustainability. If in some time of the future, a country can create current surplus and discounted values of "interest payments excluded current account surpluses" is equal or greater than total external debt, it can be assumed that external debt is sustainable. But, in countries which have a sustained current deficit, this idea becomes useless due to the vague uncertainty of the country to produce current surplus in the future.

However, if a country that has a non interest current account deficit has a stable FDI inflows, if foreign investors have a complete trust and confidence in the institutions, commercial codes and infrastructure of the country and they continuously make FDI's in this country, FDI inflows can be taken into account in external debt sustainability analysis. In this calculation, solvency criterion is calculated.

Moreover, liquidity analysis should be made in order to understand the short term debt sustainability. In this analysis, the capacity of annual foreign exchange income to meet short term debt and annual payments and interests of long term debts is analyzed. Moreover, the capacity of reserves to meet total external debt, short term external debt and annual imports is important in determining liquidity of the country. In analyzing external liquidity, debt service/GDP (GNP), debt services/reserves, debt services/export ratios gets significance³ (IMF, External Debt Statistics Guide for Compilers and Users, 2003, pg: 171-183). If there ratios increase in a certain time series, the country which releases these ratios is prone to be a currency crisis due to decreasing external debt sustainability.

³ <http://www.imf.org/external/pubs/ft/eds/eng/guide/file4.pdf>

Besides these ratios, countries' ability to find new finances in international money-capital markets and the ability of debtors to rollover these debts via these markets is an important factor in analysis.

This mentions about sustainability of marketable debts. In history, due to inabilities of some emerging countries to pay their debts to creditors, there were some operations like restructuring debt or erasing some portion of debts. Under the umbrella of Paris Club which initially comes together in 1956, creditors and debtors met and made negotiations on the conditions of external debt. The HIPC Initiative was initiated by the International Monetary Fund and the World Bank in 1996, and these initiatives are formed in order to ease the conditions of debts to be paid by underdeveloped countries. If debt is not sustainable and if debt burden limits the economic activities of a country, it can be given concessional debt. Concessional debts are debts of which NPV is below 65 percent of its nominal amount. Interest rates of these concessional debts are so low that debt service burdens gets smaller.

If a country's terms of trade get narrower, it implies that its competitiveness in international trade declines and the capacity of a country to produce FX income declines. Due to reduction in competitiveness, it may result in decline in current surplus (increase in current deficits) which makes external debt unsustainable.

3.4 INTERRELATION OF PUBLIC-EXTERNAL DEBT SUSTAINABILITY

Public debts and external debts have interdependent components. Public debts may involve foreign exchange denominated debts and if ratio of this part to total public debt is very high, public debt sustainability problem can turn into external debt sustainability problem. Or, if there is foreign exchange crisis in the country, government might not be able to pay FX denominated debt although level of FX denominated debt in public debt and debt/government revenue is not high, which can turn into external debt problem.

External debt sustainability problem can also turn into public debt problem. If banks have a currency mismatch and due to a strong currency adjustment, banks are exposed to significant capital shrink or bankrupt, government can interfere in the circumstance and recapitalize the banks or pay to the owners of individual deposits in bankrupt banks. Therefore, government may have significant budget deficits and it can increase level of public debt. Another link of external debt problem with public debt problem can be established like that if certain private sector projects which have government guarantees like construction of energy plants and other infrastructural construction projects can fail to pay back their FX denominated commercial

debts (to foreign vendors) and if government has to pay these loans to foreign vendors, this can increase budgetary spending and increase in budget deficits can result in significant rise in public debt ratio.

3.5 DEBT SUSTAINABILITY AND INTERRELATION OF INPUTS

In debt sustainability analysis, it is mentioned above that weighted average of domestic and foreign interest rates, exchange rates, growth rates, primary surpluses and debt ratio itself is used for mathematical calculations. It is assumed that (in IMF and WB DSA templates) they are exogenous variables. However, there are relations between these variables and they are endogenous. Such as, an increase in interest rates may attract foreign capital which enables local currency appreciate and decrease debt ratio to go down, but reduce real growth rate and primary surplus. Moreover, an increase in government expenditure on investments of which coefficient of capital/output ratio is lower may increase future growth that government debts become sustainable while with given budget deficits and public debt ratio, debt seems to be unsustainable. Interrelation between inputs should be taken into account in debt sustainability.

3.6 RELATION BETWEEN CREDIT RATING AGENCIES-DEBT SUSTAINABILITY

Credit Rating Agency's main function is to analyze the macroeconomic indicators of a country in order to assess whether that country is able to pay its debt. Their notes are not recommendations, but these notes show their opinions about willingness of country to pay sovereign debt and sustainability of sovereign and external debt. Moreover, these agencies fulfill the function to eliminate asymmetric information between creditors and debtors (Compendium on Debt Sustainability and Development, pg: 166). They use both quantitative and qualitative methods and they give certain notes to these countries (Compendium on Debt Sustainability and Development, pg: 168). They classify countries from non-default countries to default countries. Rating notes that these CRAs give are taken by international creditors into account in lending loans to emerging countries and the more the note is closer to sovereign debt default probability, the more risk premium international creditors charge. Although this has a logic that creditors venture the counterparty risk and they want more return in order to cover this risk, higher risk premium increase the cost of financing of the government and private sector borrowers in that country. This creates problem, due to the fact that they will have to be charged more interest payment and interest rate with higher risk premium have the potential to decrease growth rate. This has the potential to make a sustainable debt payment unsustainable.

Other issues in CRAs is that they are criticized on being an oligopoly in financial markets, thanks to barriers to entry, which creates a lack of competition; opaque methodologies, procedures and processes, lack of mechanisms to protect investors if these agents make significant mistakes (Compendium on Debt Sustainability and Development, pg: 177-179). Especially, their credibility has been weakened on the basis that countries which had A –rating or “investable” ratings has been facing significant budgetary and financial problems. Nevertheless, there is not any other agencies which can rate credibility of governments to pay debts and sustainability of external debts of countries, therefore, their ratings still assumed to show sustainability of debts.

3.7 DEBT SUSTAINABILITY AND ACCESS TO MONEY MARKETS

As mentioned before, debts are paid by incomes that are acquired currently and in the future, asset sales (using reserves and privatizing state owned enterprises), seignorage incomes (if available) and with new borrowings. New borrowings require domestic and international money-capital markets. If a government has budget deficit, it can finance it by domestic and international financial markets; but if there is current account deficit, and if there is insufficient FDI inflows and non-FX debt creating portfolio investments, it should be financed by international markets. If there is a complete access to these financial markets, it can be assumed that regardless of macroeconomic indicators, a country (government) can borrow unlimited amount of money and use it in diverse sectors. However, due to domestic and international liquidity conditions and creditors’ concerns in collecting back the loans that they lend to borrowers; full access to financial markets becomes unrealistic.

Access to financial markets is a crucial condition not only to finance expenditures, but also to finance debt repayment. If creditors think that macroeconomic outlook of the country has deteriorated and due to credit rating agencies downgrade that country’s credit notes, creditors stop to lend loans to debtor country (government), this means that debtor has lost access to financial markets and even for refinancing its debt, it does not find financing which results in default. So, even for rolling over debt, access to international markets has to be sustained. Loss of market access for debtors means unsustainability of debt.

3.8 EXTERNAL DEBT SUSTAINABILITY AND CAPITAL FLOWS

International capital flows can mainly be distinguished by two points: Long term capital flows (FDI and long term borrowings) and short term capital flows (hot money). Short term capital

flows are characterized by foreign investors' investment on government bonds and equity markets. Although foreign investors who invest on government bonds and stock markets are pension funds and other investment companies and they have a long term outlook, due to easy convertibility of these assets into foreign exchange and almost complete capital mobility, investment on bonds and stocks is classified as short term funding.

In debt sustainability analysis, international capital flows has two contrary effects.

If a country is a closed economy and if capital mobility is prohibited legally, debtors which has FX liabilities may not be able to find foreign resources to refinance their debts, and for those debtors, 1 year loss or a provision expense due to inability of an FX receivables to be collected, may affect their balance sheets and they may not pay FX liabilities. Moreover, in the absence of capital mobility, a country may miss the opportunity of attracting productive foreign capital and miss the potential to grow at a higher rate. Therefore, being open to international capital and allowing capital mobility has a growth effect.

However, complete capital mobility has also perverse effects, too. If a country's current account deficit is mostly financed by non-productive short term funds, and if these funds have gone out in existence of crisis signals, some debtors who have FX debt payment may face default due to reduction in reserves, local currency may face a strong depreciation/devaluation and due to currency losses, firms and banks which had short FX position may bankrupt. In short, leaning on short term foreign financing can result in unsustainable debt situation.

The inability of a country (regardless of debtor being the government or private sector) to pay maturing debt due to capital outflow may decrease the capacity of production (due to bankruptcies) and debt sustainability can deteriorate further.

Capital mobility does not only create problems in debtor countries, but also create problems in creditor countries, too. If debtor country cannot pay its foreign debt to creditors (due to illiquidity), the creditor country's receivable becomes illiquid and creditor country may also have problems in fulfilling its own liabilities to other creditors. Therefore, a foreign debt-exchange crisis can spill over to tightly related countries. Moreover, if these funds are used in financing current account deficits, flow of short term capital from a region to another region may create major exchange rate corrections in the region that funds get out and creates the potential to create crisis in region that money is coming. So, international financial flows create contagious effects in countries that these flows circulate.

East Asian crisis is a striking example of crisis and unsustainable debt structure. 1990s, in ASEAN countries, short term external borrowing and portfolio funds increased. These funds were used in financing investments and this situation increased leverages of both corporate institutions and financial intermediaries. Increase in leverage in banks also increased level of fragility of financial system. Moreover, financing of long term investments with short term funds resulted in not only FX mismatch, but also maturity mismatch. Until 1997, there was also increasing domestic demand, creation of offshore banking and implicit and explicit government guarantees to banks and certain corporate sector increased excessive risk taking. Inefficient regulatory mechanisms (insufficient capital adequacy ratios, legal lending limits) contributed to the culmination of crisis potential (Agenor, Miller, Vines, Weber, 1999, pg: 9-64). All these resulted in unsustainable debt structure (in terms of illiquidity) and Asian financial crisis happened.

3.9 DEBT SUSTAINABILITY AND DEBT LIMIT QUESTION

In some debt sustainability analysis, debt ratios are classified as sustainable debt level and unsustainable debt level. In Maastricht treaty, members of EU should keep debt/GDP ratio below 60 percent (Wolff, 1998, pg: 2). Despite the fact that this ratio is so-called legalized in order to keep fiscal policy of each states coordinated with each other and avoid in fluctuations in Euro, almost all of Eurozone countries' debt ratios are above Maastricht criteria and above this level, member states has problems in sustaining their fiscal policies. It is observed in Greece and Cyprus of which spreads (over interest rate of Germany's government bonds) were large and growth rates were minus which resulted in debt crisis.

However, there is a question: Is there a universal debt ratio above which is unsustainable and below which debt is sustainable? The answer is no, because, a country which has 50 percent debt ratio may seem unsustainable while a country which has 200 percent debt ratio may not have problems in paying back its debts. It is all about the earning capacity of countries (export, government revenue), growth of economy, interest rate, and utilization of these borrowed funds (to finance debt or to finance productive investments). Moreover, debt ratio may have a tendency to grow and it may be projected to increase in 5 years, and it can exceed presumed level of unsustainable debt level, however, if debtor has huge liquid or marketable assets, or if this country has significant and credible income projections in the future (supported by determined economic policies), it may be too early to say that this debt is unsustainable. Therefore, there is not a certain debt ratio above which debt is unsustainable.

3.10 DEBT SUSTAINABILITY ANALYSIS MODELS

There are mainly two models in debt sustainability analysis: Deterministic model and probabilistic-stochastic model. In deterministic model, using external-government debt sustainability formula and projections in growth rate, interest rate, exchange rate and primary surplus-deficit (current account), debt ratios for 5-10 years are analyzed. Besides basis scenario, good scenarios and scenarios that involve shocks in interest-exchange and growth rates and primary balances are prepared and several paths are established in a chart.

This model has significant applicable features and IMF and WB uses this approach in order to assess indebtedness of country. However, this approach does not take interdependence of data and reactions of debtor to shocks into account. In order to cover the weaknesses of deterministic model, probabilistic-stochastic debt sustainability analysis is conducted. In this analysis, possible paths which debt ratio will follow and the probabilities that end period debt ratio can become is calculated. Due to long lasting process (if it is conducted manually) and including unknown factors (Epsilon), it is calculated by using computer programs and diverse simulations, like Monte Carlo simulation. The findings of analysis are displayed on a fan chart and possible debt ratio ranges can be found.

3.11 INSTITUTIONAL ARRANGEMENT OF DEBT SUSTAINABILITY

Ameliorating macroeconomic indicators (reduction in interest rate, increasing growth rate and increasing primary surplus) is important in debt sustainability, however, in order to ameliorate indicators, institutional design of the government should have some significant features.

Firstly, the duties of institutions should be clearly defined in related laws. Such as, ministry of finance is responsible in collecting taxes, using them in public services, and preparing strategies how to increase tax revenues. Tax authority should have personnel who know law and accounting but they may not need to know sophisticated financial management techniques and statistics. However, debt management is a different area which involves both technical skills and personal skills. In order to fulfill debt management, an institution should have personnel's who have sufficient level financial management, accounting, and law and statistics knowledge in order to assess risks that derive from debt management. The duties of tax authority and debt management authority should be clearly divided.

Moreover, central bank, which controls short term interest rate, should have operational independence in order to reach middle term plans of government. This is important not only for

isolating economy from political effects, but also for sustaining accountability and effectiveness of central bank.

State officials which implement operational jobs and daily transactions should be audited and controlled effectively. If they are not audited, there is a possibility that these officials may make frauds. Even though they do not fraud, they might make mistakes or unknowingly they make transactions which are contrary to laws and regulations. In order to prevent fraud and faulty operations, state officials and their operations should be audited and controlled.

Another point, which is not directly related to institutional arrangements, but related to legal aspects of economic activities is that, civil, debt, commercial and bankruptcy laws should respond to current global economic relations and there should not be blurred areas in regulations. This is crucial in that if there are gray areas in these regulations, or if these regulations contain points that hardens foreign investors' daily job operations, foreign direct investment cannot be attracted.

IMF uses an index to assess institutional capacity and quality of governments. It is named as CPIA. CPIA involves diverse standards to assess quality of institutions of a government and all government is rated from 1 to 6. If a government is well rated in this index, it is considered that this government has low operational risk and if they lend to a government, the risk of default is lower than the governments that has badly rated and it has the power that reduces political risk of this country. So, this index itself has an effect on reducing interest rates.

4. CONCLUSION

Debt sustainability analysis can be departed into two: public debt sustainability and external debt sustainability analysis.

A sustainable public debt requires a sustainable budget, which is dependent on healthy income sources. Seignorage, or income from money printing is least healthy revenue, due to inflationary effects which has potential to deteriorate expectations of corporate real investors. Revenues of state owned enterprises are healthier than seignorage, however they may be exposed to business cycle and this income may not be stable. Tax revenue is healthier than seignorage and SOE revenues. If government finance is weightily based on tax incomes, government revenues are more sustainable than previous ones.

Moreover, expenses should be elastic, too. If certain structural expenses, like personnel expenses and investment expenditures of which investment will be completed in more than one year, compose an important part of government expenses, this results in inelasticity of budget expenses and in in downtrend in business cycle, due to inability to reduce these expenses, budget deficit may rise.

To finance budget deficit, governments borrow from either banks, or official creditor, or directly from people or central bank of the government. As mentioned above, borrowing from central bank creates inflation so; it may not be a viable option. Domestic borrowers may charge higher interest rate than international creditors, however, international borrowing involves FX debt, so debtor government faces a currency risk (tax incomes are generally in terms of local currency). Official creditors give credit for developmental purposes (WB), or to recover short term imbalances (IMF) or to enlarge maturity and cut interest rate for heavily indebted poor countries (HIPC) to make their debts sustainable.

For a sustainable government debt, two criteria should be fulfilled. Firstly total amount of discounted future cash flows (primary surplus) should be equal or greater than current government debt (No Ponzi game condition). To sustain this, there should be sufficient primary balances and growth rate of the country, and real interest rate accrued on government debt should not exceed a certain level. Second criterion is liquidity criterion, in which the ability of government to repay short term debt via government revenues, liquid assets and assets that is easily liquidated in short term.

There are diverse mathematical formulas that are used in government debt sustainability analysis. In conventional debt sustainability analysis, IMF's debt sustainability formula is generally used. However, there are some criticisms to IMF's debt sustainability analysis, as analysis of IMF neglects off balance sheet liabilities of government, like banking liabilities (deposit insurances and potential recapitalization requirements); never mentioning how to change macroeconomic variables (increasing growth and reducing interest rate) and criticizing that baseline projections are overly optimistic.

External debt sustainability involves a detailed look at current account balance and capital account balance and understanding the reasons of deficit or surplus of current account (components of foreign trade and service balance) and if there is deficit, the financing of this deficit. If imports are not elastic and if exports are exposed to global business cycles (if exports decline sharply if global demand is decreasing), external balance may not be sustainable. If current deficit is financed by short term debt or portfolio flows, this has a potential to affect external debt sustainability in a negative way. Portfolio flows may be invested in stock markets and bonds which are denominated in local currency, however, due to the fact that portfolio flows can be exchanged with foreign currency and reverse away, they have a potential to negatively affect sustainability of external debt. So, in external debt analysis, not only foreign debt, but also international investment position should be analyzed.

In external debt analysis, as government debt analysis, there is solvency criterion and liquidity criterion. In solvency criterion, discounted future non-interest current account surpluses should be at least equal to current external debt. In liquidity criterion, foreign reserves and FX revenues in one year should compensate one year liabilities. In this analysis, debt service/reserves, import/reserves ratios are generally used.

Credit Rating Agencies, which are rating sovereign and external debt payment performance, has an effect on debt sustainability. Although governments can sustain their entrance to financial market via using these rating notes, risk premiums that are charged by international private creditors inversely affect debt sustainability. The more negative macroeconomic indicators a country have the more risk premium this country is charged, so this is problematic for debt sustainability of this country.

International capital mobility has two contrary effects. Positive effect of it is that a country can attract FDI-non debt creating capital, not only attracting FX, but also increasing productivity in the country and increasing potential to grow. Negative effect of it is that if portfolio capital is

attracted and it is used in financing current account deficit, the reversal of portfolio flow means potential problems in paying back external debt.

Institutions are important in debt management. If rules and regulations of related institutions clearly define the tasks of personnel and the duties of institutions, debt can be effectively managed. Moreover, auditing and inspection is important in these institutions in order to avoid operational risk and fraud.

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