



SOVEREIGN DEBT CRISIS: A REVIEW OF REASONS, CONSEQUENCES AND SOLUTIONS

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ABSTRACT

Substantial consequences are things that are often reminded for every country when they fall into a debt crisis and face the risk of default. However, the impact of the sovereign debt crisis on the economy is still controversial when previous studies have produced mixed results. Some studies suggest that insolvent countries need to face serious penalties, while others mention forgiveness, or even an opportunity to boom after insolvency. This article reviews the impact of the sovereign debt crisis in both theoretical considerations and empirical evidence, while depicting the causes and consequences, as well as solutions to solving the debt crisis. Several important solutions have been drawn, including promoting economic growth; developing programs and mechanisms to control lending; debt restructuring; using macroeconomic instruments and tightening policies; interventions of IMF and other financial institutions. In particular, the impact of domestic debt is also thoroughly analyzed in this study.

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INTRODUCTION

Financial supports or loans played a crucial role in development, especially under-developing countries. However, when the government borrows too much money and is unable to repay, then it will face with "sovereign debt crisis". Regarding debt status, total public debt over total revenue or debt to GDP ratio is good indicator to explain debt situation and ability to repay of a sovereign. Each financial area has different requirement ratio, and it also changes over time. In Eurozone at the moment, according to Maastricht Treaty, which applied for all members of European Union, "the national debt should not exceed 60 percent of GDP". According to statistics of Reinhart and Rogoff (2011a) for 90 episodes of external default during 1827-2008, total debt over revenue of cases in Latin America was highest with 4.7 times, Asia was the second with 3.9, European with 3.7 times and the last one, Africa with 2.7 times. In which, some notable defaults should not be forgotten like Spain in 1877 (15.83 times), Argentina in 1890 (12.46 times), China in 1939 (8.96 times), Pakistan in 1998 (6.28 times) or Mexico in 1982 (5.06 times). Recently, based on data from Eurostat (May 2017), European Union is facing with big debt crisis from its members,

including Greece (€316 billion as public debt to GDP ratio 175 percent), Italy (€2.2 trillion as 132 percent), Spain (€1.1 trillion as 99 percent) and Portugal (€244 billion as 129 percent) and soon or later, this will lead a big trouble with EU to keep its community unity and development. Nevertheless, in general literature, data on sovereign debt crisis is inadequate and missing (Reinhart and Rogoff, 2011a); hence a comprehensive database is necessary. These statistics will not only help future government understand characteristics of public debts, but also provide previous experiences to deal with this problem. So, what will happen with a nation and government after a public debt crisis? Will a country receive high punishments or just forgiveness? In fact, there are contrary arguments between theories and empirical studies, and even differences between empirical evidence. Theoretically, Eaton and Gersovitz (1981), Kletzer and Wright (2000), Amador (2004), Aguiar and Gopinath (2006), Kovrijnykh and Szentes (2007), Arellano (2008), Sandleris (2008) found that, defaults would not only exclude sovereigns from competitive financial markets, lead a higher future borrowing costs but also have negative effect on credit for domestic private sectors. Further, lots of adverse effects must be considered, such as hostility in trading process (Rose, 2005), significant reduction of foreign credit to private sector (Arteta and Hale, 2008; Acharya and Rajan, 2013) or even direct sanctions, including military and political pressure

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(Mitchener and Weidenmier, 2010; Sandleris, 2016). However, on the contrary, previous literature and empirical evidence also argued for a “forgiveness” or just short-term consequences, such as Grossman and van Huyck (1988), Sandleris (2016), Gelos *et al.* (2011) or Borensztein and Panizza (2009). Further, the most crucial consideration is solutions of government and how an economy reacts with sovereign debt relief, after facing with consequences from the public debt crisis. However, previous studies seemed to focus only reasons, and they did not provide meaningful solutions for this (Reinhard and Trebesch, 2016). Hence, in this paper, the author focuses on three objectives. Firstly, the paper provides the definition, reasons for sovereign debt crisis in the first section. The knowledge of this sector is critical since it can help sovereigns to understand the origin and nature of this issue, which is essential foundations for meaningful recommendations. In the second section, the author analyzes impacts of the debt crisis on sovereign’s economy, which is useful information resources for debtors’ activities and intervention strategies. In the last section, the author provides some necessary solutions for governments when they are facing high public debt and pre-crisis.

Definitions and Reasons for Sovereign Debt Crisis

Definitions of Sovereign Debt Crisis: According to Investopedia Dictionary (2017), debt is “an amount of money borrowed by one party from another”. The lenders and borrowers are very diversified. They can be an individual, an enterprise, local government, or even a country. There are lots of purposes when a government borrows money, such as investing in infrastructure, supporting production or other plans. Normally, these debts must be repaid within specific periods, such as 10 years, 20 years or 50 years. However, when public debt reaches a critically high level, the government is unable to repay and this country will suffer extremely because of default consequences. This phenomenon was called “Sovereign Debt Crisis”. Sovereign Debt has two kinds of debts: Internal and External debts. In which, internal (or domestic) debt referred lenders within the country, and the debt could be called external (or foreign) debt when lenders are in foreign areas. It also can be classified as short-term or long-term debts, depending on the duration of repayment.

Reasons for Sovereign Debt Crisis: There are lots of reasons for the debt crisis. With banking system approach, Reinhart and Rogoff (2011b) tried to find the link between banking and public debt crisis and found that a more significant increase of external debt was the first sign of banking crisis. Further, the banking crisis was a severe symptom of a very close sovereign debt crisis. They also emphasized that domestic debt was an important issue in debt crisis, but it was usually hidden by the government. The same ideas, Candelon and Palm (2010) used the balance sheet and graphical analysis to measure debt vulnerability and emphasized the strong relationship between banking crisis and sovereign debt crisis. More details, De Bruyckere *et al.* (2013, p.4793) described “contagion” between banks and sovereigns, in which “a weak capital buffer, a weak funding structure and less traditional banking activities” would risk to sovereigns. They also provided three contagion channels through empirical evidence, which might influence to the sovereign, including a guarantee, asset holdings and collateral channels. They also suggested that interventions of government on contagion might be useful, but their effects depend on particular situations. Similarly, Calabrese *et al.*

(2017) emphasized that contagion effects of bank failures might lead a high possibility of systemic risk and threaten the European Union. With the monetary approach, Lane (2012) argued that, with the monetary union such as the European Union, the absences of banking union and buffer mechanisms were major reasons for their debt crisis. The lack of multi-country crisis management was one of the main factors that led a volatility of their monetary cooperation during the crisis. The monetary union was very fragility, but numerous leaders did not know. Further, debt crisis also came from asynchronous monetary policies within the monetary union, such as interest rate policy. Using the same currency, but some countries lived with low-interest rates, while others might face with the very high-interest rate; hence this led a risk to the operation of one currency coalition (Gajewski, 2015). As the results, lots of weak countries might get the loss (for example, in the European Union, they are Greece, Spain and other Benelux countries), while ECB monetary policies seemed to support core countries, such as Germany or France (Crowley and Lee, 2009). Further, with a currency union, the absence of currency market might lead “systemic risk” shift in market pricing behaviour, caused currency crisis and influenced directly to government bond market (Arghyrou and Kontonikas, 2012). Then currency crisis would affect negatively and lagged on debt crisis through contagion effects, in which currency crisis would reduce budget balance and payment of debt service (Dreher *et al.*, 2006). Generally, there is nothing like “perfect equality” in a coalition.

Another important reason is the perception of investors which may influence significantly to a debt crisis. This factor can be negative or positive depending on the reputation of sovereigns, expectation and specific situation, including domestic factors. Barrios *et al.* (2009) found that risk perception was a major determinant of government bond yield spreads. Liquidity, sovereign risk and other domestic factors influenced smaller, but their impacts increased day-by-day and must be considered. With dynamic panel approach, Attinasi *et al.* (2009) concluded that sovereign bond yield spreads were explained by 56 percentage of the international aversion, 21 percentage of the failure of fiscal policies and other small proportions of liquidity proxy (14 percent) and bank rescue (9 percent). In addition, sovereign rating information from credit rating agencies is also a reason which cannot be overlooked. Arezki *et al.* (2011) found that downgrades of sovereign rating influenced significantly to all participants of the financial market through spillover effects. Negative announcements of rating agencies might threaten the stability of the financial market directly. Further, authors proposed three ways to deal with risks from negative spillover effects, including (1) using communication power to assure investors, (2) preparing a contingency plan for bad situations, (3) reviewing credit rating process following financial markets regulations. Although information from credit rating agencies usually is relatively objective, there is still the possibility for bias due to external pressures. On the other hand, there is nothing to guarantee that their data and rating methodology is fully accurate and highly representative. Hence, above solutions are essential steps to help governments correcting any potential mistakes.

Impacts of debt crisis on sovereign's economy: In history, lots of sovereign debt crises happened and how this event influencing to sovereign’s economy is still debatable. In fact, there are contrary arguments between theories and empirical evidence. Further, empirical study on sovereign debt crisis is

very inadequate, and results were mixed. Hence, in next sections, the paper provides multidimensional views on this issue and new practical contributions.

Theoretical Considerations

First view: Consequence of Sovereign Debt Defaults:

Theoretically, Eaton and Gersovitz (1981) explained a permanent exclusion from capital markets and credit ceiling from lenders for borrowers in case of debt defaults. Considering borrowing and lending is “intertemporal barter without exogenous enforcement of commitment”, Kletzer and Wright (2000) emphasized the role of reputation in this process and it could influence significantly. In the political economy model, Amador (2004) concluded that countries with political uncertainty (or numerous parties in power alternately) should not be accepted borrowing again after default because they are unable to save and their incumbent party focused only short-term. In the model of small open economy and emerging markets, Aguiar and Gopinath (2006) showed that default punishments created “sizeable debt to GDP ratios in equilibrium”, meanwhile, there is no “free lunch” for defaulters. In the model of strategic lending, Kovrijnykh and Szentes (2007) referred to monopoly power of lenders after defaults and predicted that only “good shocks” could help debtors access again competitive credit market. In case of 2001 Argentina, Arellano (2008) showed significant default consequences with government’s monetary instruments, including the high volatility of both interest rates and consumption relative to output. Further, he also found a negative relationship between interest rates and output, which caused many difficulties for the government in implementing monetary policies. Besides, he showed an opposite movement between the trade balance and output, in which trade deficit and high debt might reduce output. The same ideas with Eaton and Gersovitz (1981), Sandleris (2008) reminded that sovereign defaults would restrict nation from credit markets, led a higher future borrowing costs and negative effects on credit for domestic private sectors.

Even, a country can recover partially after resolution; sovereign bonds were established to compensate consequences to creditors (Yue, 2010). Additionally, lots of other adverse effects must be considered. Using dataset of 150 countries over 50 years, Rose (2005) described hostility in the trade with reduction of 8 percent a year during 15 years of debt renegotiation. Arteta and Hale (2008) found a significant deduction over 20 percent in foreign credit to private sector, not only during debt renegotiations but also two years after in emerging market. In case of a country with the more developed financial institution or high rate of government bonds, this decline was even more massive (Gennaioli *et al.*, 2014). Domestic financial sector faced enormous adverse consequences by defaults (Acharya and Rajan, 2013). More interesting, direct sanctions were applied significantly in history, including trade credit limitation, asset seizure, gunboat diplomacy, fiscal and international financial control, even military pressure and political control during period 1870-1913 (Mitchener and Weidenmier, 2010). More specifically, Sandleris (2016) suggested three sources of default costs, including direct sanctions from lenders, negative information and reputation about borrower’s government and direct costs from domestic sovereign debt. In overall, there is nothing likely “forgiveness” for defaulters.

Second view: Forgiveness for Sovereign Debt Defaults: On the contrary, Grossman and van Huyck (1988) claimed that the default was forgiven and did not influence to reputation, it has been just about “contingencies”. After the crisis, governments still have no trouble with borrowing costs and their reputation in the financial market. On the other hand, empirical evidence for the consequence of public debt crisis is also limited and provide opposite results with leading theories. Sandleris (2016) suggested that costs from trade penalties or restriction from credit markets were not significant in current time, but information revelation could be. Gelos *et al.* (2011) found that frequency of defaults did not impact the ability of market access, but the vulnerability to shocks, the quality of economic policies and institutions were the major determinants. Similarly, Borensztein and Panizza (2009) assumed that cost of defaults is remarkable, but just in short-term. It is also the same with the sovereign reputation of borrowers, taint or reduction in short-time only. Trade credit might not be influenced by defaults. Further, the connection between theories and empirical evidence about sovereign defaults is still missing (Cruces and Trebesch, 2013). Panizza *et al.* (2009) concluded that there was no empirical evidence supporting the classic theory of significant punishments because of sovereign defaults. More details, he found that financial market exclusions were possible, but only in short-time, cost of future borrowing was small and provisional. Trade reductions were possible, but the literature could not determine sources of reduction. The legal pressure was feeble, and no evidence has been found in case of political or military intervention.

Another chance from debt relief?

While the question about how debt default influencing to the sovereign is debatable and previous studies provided mix results, another confusion about how debt relief impacting on economies is even more meaningful. Regarding the chance for growth, the effect of public debt on economic growth depends on the particular economic situation and the result is also different between short-term and long-term. Elmendorf and Mankiw (1999) provided “conventional view” about public debt and argued that short-term budget deficits can push improvement of income, aggregate demand and national outputs. However, Ricardian Equivalence¹ needs to be held, if not, a higher public debt will lower total investment, both domestic and foreign. This fall might destroy capital stock, increase the interest rate, and then reduce labour productivity and wages also (Panizza and Presbiteno, 2013). Further, following expectation theory, it also leads an increase in future public debt and a decrease in future GDP. After intensive calculation, Elmendorf and Mankiw (1999) assumed that each additional dollar of public debt might reduce 10 cents of gross national output, in which 9 cents came from the reduction of capital stock and another one cent came from tax distortion. The same direction, Panizza and Presbiteno (2013) argued that when public debt increased 100 percent of GDP, economic growth would lose “20 basis points in first twenty years”. This negative impacts even were harder in case of confiscation policy or uncertain reaction of government through inflation

¹Ricardian Equivalence is economic hypothesis assume that customers understand government’s budget fully when making their consumption decisions. This results that method of financing government spending does not affect customers’ decisions. Ricardian Equivalence believed that there is no difference between tax increase or borrowing money. Both their activities boost aggregate demand (Barro, 1979).

and financial restriction (Cochrane, 2011a,b), particularly with developing countries. In these nations, governments tended to use numerous strategies to attract capital and borrowed some money to invest in infrastructure. Since they had low management skills, high-level of red tape, serious corruption problems, their investment projects were very ineffective, while public debt increased significantly. As the results, foreign aids did not help them to increase national capacity but left a sizable debt for next generation. Additionally, there were numerous previous papers determining impacts of debt on growth and providing evidence that this relationship was non-linear and depended on the presence of a threshold (Panizza and Presbiteno, 2013). Checherita-Westphal *et al.* (2014) suggested an “optimal level of public debt” following business cycle, where a nation could maximize their economic growth through capital flows, which is around 43 to 63 percent of GDP. However, Greiner (2011) argued that this effect depended on “presence of rigidities in the economy”, and in a model with no rigidities, public debt definitely reduced investment, labour capacity and economic growth. Furthermore, Greiner (2012) concluded that this relationship (between debt and growth) followed an inverted U-shaped. On the other hand, Sachs (1989) and Obstfeld and Rogoff (1996) believed potential welfare benefits, in which both debtors and creditors could gain from debt restructuring and recovery in debt relief process. In opposite view, Cole and Kehoe (1998), Aguiar and Gopinath (2006) and Arellano (2008) warned about reputation loss, heavy direct sanctions and output deduction. Since consequences of the sovereign debt crisis are debatable, there is a significant confusion that debt relief could recover the damage of debt crisis or not. Moreover, debt relief might limit the incentives to reform sovereigns’ economies (Easterly, 2002), and debt renegotiations might raise collective action problems since it was usually hard to achieve universal decisions. These potential delays could decrease output (Benjamin and Wright, 2009; Pitchford and Wright, 2012). Again, empirical evidence is still missing.

Empirical Evidences

Price of Haircuts: In default study, one of most important consideration is how to evaluate the cost of default, including creditor losses, or so-called “haircuts”. This indicator was based on a crucial conclusion that future borrowing conditions of defaulters depended significantly on the amount of creditor losses. Cruces and Trebesch (2013) had two important contributions. Firstly, they built a new database of haircuts, which covered all data on creditor losses from 1970 to 2010 with nearly 200 different sources. It was calculated by the below formula following the suggestion of Sturzenegger and Zettelmeyer (2008), in which r_t^i is the interest rate (at the exit from default) and H_{Szt}^i is the market haircut:

$$H_{Szt}^i = 1 - \frac{\text{Present Value of New Debt } (r_t^i)}{\text{Face Value of Old Debt } (r_t^i)}$$

This new formula overcame some weakness of IMF formula since it could capture fluctuation of old debt by exchange rate and cumulative investor losses (Cruces and Trebesch, 2013, p.88-90). In the previous measurement of haircuts, bonds and loans were taken into account on the day of exchange, but in fact, the old debt was not fully serviced at the same time in most cases. Further, new haircut estimation method also covered the wealth loss at the exit from default, which did not

mention in the previous methods. To calculate present values of all debts, they first computed contractual cash flows with detail information about amounts, maturity, interest rate, exchange rate and others. Then, they calculated present value for each loan and each bond using imputed discount rate from the voluntary market (Cruces and Trebesch, p.91). The previous papers usually used secondary market, such as Sturzenegger and Zettelmeyer (2008), but data on this market was only available for recent cases with full information. With older debt, a constant rate was used (typically 10 percent) by numerous researches (such as Andritzky, 2006; Benjamin and Wright, 2009). However, this hasn’t been a reasonable assumption since each debt had different conditions and came from various sources and agreements. On the other hand, even discount rate from the voluntary market is good choice to calculate the present value of old debt, but it is still not perfect rate since the voluntary market has their own disadvantage by several selected goods and services. Since the author did not explain in details how to select “voluntary goods and services”, it is hard to identify that author’s selection is enough representative or not. Further, data selection methods could make author’s data more reasonable, but it is also clear that lots of cases were ignored due to very restricted requirements. Besides, since data was collected from 189 different sources, standardization must be applied, but it did not mention in the research.

The second contribution of Cruces and Trebesch (2013) was the discovery of relationship between restructuring outcomes and later borrowing conditions through a fixed effects panel regression with Emerging Market Bond Index Global (EMBIG) for 47 countries, lag up to 7 years and semi-parametric survival models with microdata on more than 20,000 loans and bonds. The model was built based on bond spread equation, which was proposed by Dell’Ariccia *et al.* (2006) or Panizza *et al.* (2009). The new contribution of Cruces and Trebesch (2013) was that they used a continuous measure of investors’ outcomes, which brought more advantage than the previous method with the binary default value. The model was estimated through two steps. Firstly, the author estimated coefficient based on the fundamental model:

$$S_{it} = \{\Phi_1 I_1(i, t) + \Phi_2 I_2(i, t) + \Phi_3 I_3(i, t) + \Phi_{4-5} I_{4-5}(i, t) + \Phi_{6-7} I_{6-7}(i, t)\} H_i + \beta' X_{i,t-1} + \omega_i + \eta_t + u_{it} \quad I=1, \dots, N; t=1, \dots, T \quad (1)$$

In which, $I_T(i, t)$ is an indicator variable, H_i is the haircut arising from that restructuring; $X_{i,t-1}$ - vector of macroeconomic control variables, ω_i - country fixed effect, η_t - time fixed effect; u_{it} - error term and Φ_T - coefficients of the lagged haircut variable.

The second step, the author added the linear term R_t to above equation:

$$S_{it} = \{\Phi_1 I_1(i, t) + \Phi_2 I_2(i, t) + \Phi_3 I_3(i, t) + \Phi_{4-5} I_{4-5}(i, t) + \Phi_{6-7} I_{6-7}(i, t)\} H_i + \{\gamma_1 I_1(i, t) + \gamma_2 I_2(i, t) + \gamma_3 I_3(i, t) + \gamma_{4-5} I_{4-5}(i, t) + \gamma_{6-7} I_{6-7}(i, t)\} R_t + \beta' X_{i,t-1} + \omega_i + \eta_t + u_{it} \quad i=1, \dots, N; t=1, \dots, T \quad (2)$$

where γ_T is the coefficients of the lagged restructuring dummy variable and R_t is a dummy for the existence of a restructuring.

The model (2) was more reasonable than the model (1) since it allowed to disentangle the spread and the coefficients of lagged haircut could capture both default effects and haircut effects at the same time (Cruces and Trebesch, 2013). Further, lots of other control variables were used to increase quality and accuracy of the model, such as: Specific macroeconomic indicators (public debt to GDP, inflation rate, real GDP growth, current account to GDP, primary balance to GDP, reserves to imports, population, GDP per capita), international credit market conditions (credit rating, US low-grade corporate yield, US 10-year Treasury yield) and political situation (ICRG political risk index, government changes). The data was an unbalanced panel, and the regression was implemented with clustered-robust standard errors to eliminate potential autocorrelation and heteroscedasticity. Comparing with previous researches, Cruces and Trebesch (2013) confirmed that substantial investor losses (haircut size) would lead definitely higher spreads up to 7 years. In which, if the haircuts increase 22 percentage points, the spreads will increase 122 basic points in year 4 and 5 and 149 basic points in year 6 and 7 after restructuring. The results were robust, and the estimated cost was much higher than previous studies, which was around 50 basic points in post-crisis spreads (Benzur and Ilut, 2016; Catão *et al.*, 2009). Further, to determine the impacts of haircuts for credit exclusion duration, Cruces and Trebesch (2013) developed Kaplan-Meier Survival Function to estimate a semi-parametric Cox proportional hazard model, which not only allowed constant and time-varying covariates but also could solve the problem of censored observations and multiple events.

$$\hat{S}(t) = \prod_{i \setminus t_j \leq t} \left(\frac{n_j - d_j}{n_j} \right)$$

In which, t_j denotes the time when reaccess happens for country-case j , d_j - number of countries that reaccess at time t_j , and n_j - number of countries that have not reaccessed just prior to t_j .

Hazard rate for the i th individual was explained by below formula:

$$h_i(t) = h_0(t) \exp(\beta' z_i)$$

In which $h_0(t)$ - baseline hazard function, z - set of covariates, and β - vector of coefficients. The model was estimated via a partial likelihood function of the following form:

$$L(\beta) = \prod_{i=1}^n \left(\frac{\exp(\beta' z_i)}{\sum_{j \in W(t_i)} \exp(\beta' z_j)} \right)^{\delta_i}$$

In which, $W(t_i) = (j: t_j \geq t_i)$ denotes the risk set at time t_i and the variance correction method was used to estimate the model following Lin and Wei (1989) suggestion. With robust estimation results, Cruces and Trebesch (2013) found that there was a strong relationship between the size of haircuts and the duration for financial market exclusion. In details, an increase of 30 percent haircut size would reduce 51 percent likelihood of financial market reaccess at any time. This impact was much higher than previous evidence, in which time of exclusion was short, and the reaccess capacity of financial

market came back quickly after restructuring (Gelos *et al.*, 2001; Sandleris, 2016), or even no evidence for impacts of haircut on partial reaccess (Benjamin and Wright, 2009). With this contribution, Cruces and Trebesch (2013) firstly emphasized the importance of restructuring outcome for solving consequences of sovereign debt crisis in term of reaccessed speed to the financial market. Further, Cruces and Trebesch (2013) also noticed that bigger countries (with higher population size, GDP per capita) or the sovereign with better credit rating could be returned financial market sooner, while a country with a high debt to GDP or low fiscal balance would face with longer exclusion duration.

The results found by Cruces and Trebesch (2013) were robust and consistent to explain consequences of the debt crisis on the sovereign financial market. Although findings are different (or even opposite with previous empirical results), they correspond with leading theories on debt crises. However, as the authors explained in their results, they could not identify a direct linking between inventor's losses and later borrowing conditions; hence the results might still get a bias; therefore, further researches to discover impact mechanisms are necessary. Additionally, since the price of haircuts was high, minimization creditor's losses could be a meaningful recommendation, but Cruces and Trebesch (2013) did not totally suggest that. They mentioned to potential benefits in short-term of debt relief process. Hence, should the government try to keep low haircuts or believe better future from debt relief? The author continues to analyze another article for classification.

Aftermath of Debt Relief: As the paper mentioned before, one confusion of every government when facing with the debt crisis is which the strategy used to deal with this hard time. Reinhart and Trebesch (2016) had two new major contributions in analyzing the aftermath of debt relief. Firstly, they analyzed the magnitude of debt relief reflecting through the process of default and restructuring in 48 crisis spells. They monitored the change of macroeconomic indicators during ten years through relief process. Based on these tracking, it was easy to compare economic performance before and after relief event. While previous researches focused on sovereign defaults on private creditors, Reinhart and Trebesch (2016) concentrated on government creditors, which was missed in preceding literature framework. Since comprehensive picture on debt relief was still limited, while Benjamin and Wright (2009) and Cruces and Trebesch (2013) estimated the price of haircuts (investor's losses), Reinhart and Trebesch (2016) tried to compute benefits of debt relief and suggested crisis resolutions. These contributions were very meaningful in providing the different approaches to the sovereign debt crisis. Secondly, they implemented a difference-in-differences (DiD)² regression to provide comprehensive impacts of debt relief on a sovereign's economy. In additions, to solve the problem of time variation in estimation, Reinhart and Trebesch (2016) included country and time fixed effects in estimation and also used robustness checks for confirmation by adding more scenarios with external pressure, such as banking, currency crises, wars or

²Difference in differences (DiD) is an econometric instrument to studying the differential effect of a treatment on different groups (treatment versus control groups) in an experiment. It is effective method to determine the effect of a treatment on an outcome (Abadie, 2005).

political intervention. To evaluate how debt relief changed the economic landscape of debtor countries, Reinhart and Trebesch (2016) examined the evolution of several indexes, including (1) per capita GDP (levels and growth rates), (2) sovereign credit ratings, (3) debt servicing burdens and (4) levels of external and total debt. Results were explained by below figures.

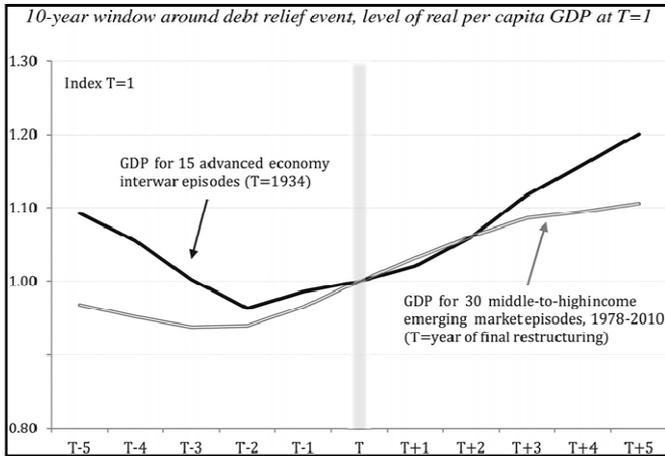


Figure 1. Real per capita GDP around debt relief events in middle- to high- income emerging markets (1978-2010) and advanced economies (1934) (Reinhart and Trebesch, 2016)

As seen, in the figure, GDP of both groups, especially advanced economies faced significant losses during defaults process, however, rebound strongly when relief event happened, in which cumulative growth was 20% from T to T+5. Sovereign took eight years to recover the real capita in T-5. It was also the same as emerging market countries when cumulative growth was 11 percent after five years of relief event.

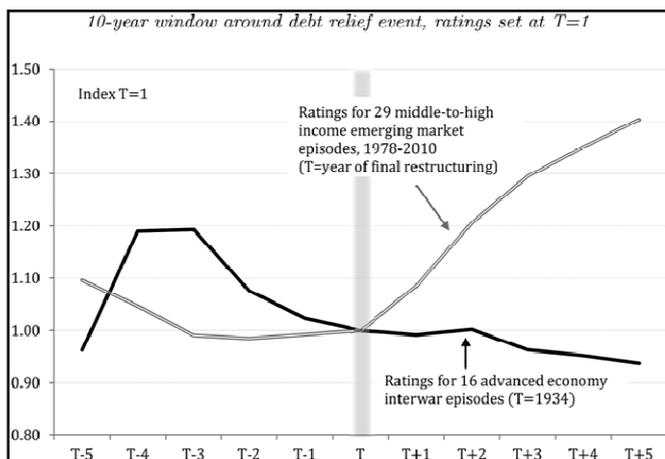


Figure 2. Credit ratings around debt relief events in middle- to high- income emerging markets (1978-2010) and advanced economies (1934) (Reinhart and Trebesch, 2016)

Regarding sovereign credit ratings, there was a significant difference between advanced economies and emerging market after debt relief event. During defaults, both groups showed a significant fall in credit ratings, especially with advanced economies. However, after relief event, while there was a slow decreasing of credit rate in advanced economies, emerging markets showed a considerable variation. In which, credit

ratings rebound strongly with an average improvement of 21 percent after two years and 40 percent after five years of Institutional Investor Rating Index in almost default cases.

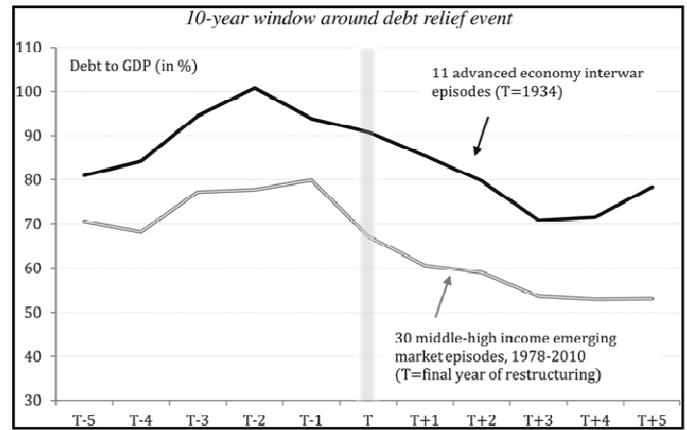


Figure 1. Total debt service to GDP (around debt relief events in middle- to high- income emerging markets (1978-2010) and advanced economies (1934)(Reinhart and Trebesch, 2016)

In debt relief event, the sovereign expected in a reduction of debt servicing costs and this was also confirmed. Reinhart and Trebesch (2016) described a significant deduction of this cost through debt relief event. In details, debt servicing costs reduced from 4.2% of GDP in T-3 to 2.4 percentage of GDP in T+5 (equivalent to 45% reduction) with advanced economies. In case of emerging markets, the cost declined from 8 percentage of GDP in T-4 to 6 percentage of GDP in T+4 (a 25% reduction).

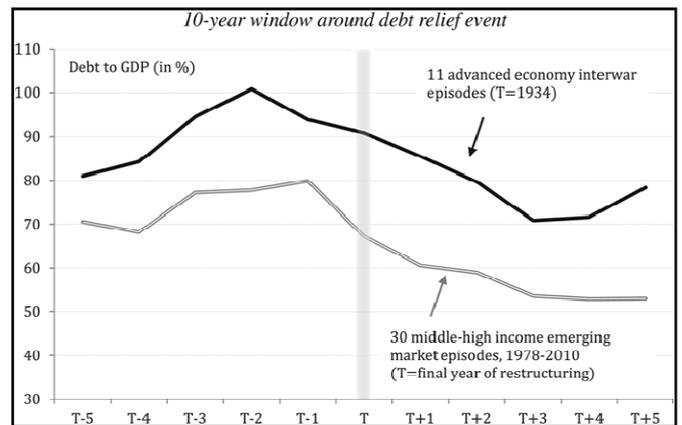


Figure 2. Debt to GDP around debt relief events in middle- to high- income emerging markets (1978-2010) and advanced economies (1934) (Reinhart and Trebesch, 2016)

In debt crisis, a reduction of total sovereign debt is a very important index to reflect the effectiveness of relief event. As expected, data from Reinhart and Trebesch described a significant decline of public debt to GDP in both groups (advanced economy interwar in 1934 and emerging market 1978-2010). In the first group, debt to GDP drop from 100 percent in T-2 to 71 percent in T+3. In the second group, there was also a significant decrease from 80 percent in T-1 to 53 percent after T+3. Overall, although defaults might damage economic output, sovereign's reputation and capacity to access competitive financial market, debt relief could bring the second chance to the sovereign for development. However, it is clear that the outcomes are not the same with all sovereigns

and needs lots of government's efforts. To evaluate more precisely how debt relief influenced to economic performance, Reinhart and Trebesch (2016) ran DiD regressions. A general equation was explained by below function:

$$Y_{it} = \beta_0 + \beta_1 \text{after} + \beta_2 (\text{treat} \times \text{after}) + \delta_i + \gamma_t + \varepsilon_{it}$$

in which, i refers countries, t - the year of observation with $t \in \{\tau_i - 5, \dots, \tau_i - 1, \tau_i, \tau_i + 1, \dots, \tau_i + 5\}$, treat - dummy variable for treated countries, after - special dummy variable in which, it will turn one after the treatment happen, ε_{it} - error term. β_2 - coefficient of interest, which will explain effect of debt relief, δ_i - country fixed effects, γ_t - the time effects. Hoover Moratorium 1931, Baker Plan 1986, Brady Plan 1990 were chosen for analysis. From DiD regression result, Reinhart and Trebesch (2016) found that debt relief improved growth, credit ratings, debt sustainability significantly, especially in the mid-1930s, early 1990. However, crisis solutions, such as debt rescheduling, maturity extensions, bridge loan, reductions of interest rate would not be significant forces for enhancing growth, credit ratings and they were also ineffective instruments to dealing with sovereign debt crisis. Regarding debt stocks to GDP, the regression results recorded a remarkable decline after agreements on debt relief. More interestingly, Reinhart and Trebesch (2016) did not find appreciable impacts of debt relief on future debt servicing. Reinhart and Trebesch (2016) provided meaningful analyses on how debt relief influencing to economic landscape based on numerous default events in history. The comparison technique is useful method in an experiment when it could help to analyze differences between pre- and post-event or control- and treated group, but its accuracy is questionable, depending on data sufficiency. Further, the change of growth or credit ratings during debt relief episodes might not mostly come from relief agreement (R-squared of all regression in Reinhart and Trebesch (2016) lower than 25 percent and just 10 percent in case of GDP growth analysis), even when effects of timing and specific-country-condition were controlled through dummy variables. Also, domestic debt was not mentioned in the study, while its role is disputable.

Role of Domestic Debt: Previous studies evaluated impacts of defaults on economies through external debts because they assumed that domestic debt was just about "internal issue" of governments. Domestic debt held a minor role in defaults and relief process. Besides, differing with external debt, which usually spreads lots of pressure to the sovereign, domestic debt is just about the internal relationship between governments and their own citizens, enterprises and institutions; hence it has never been noticed clearly and accurately, especially with high-corruption-countries. Reinhart and Rogoff (2011a) focused on domestic government debt since they found that nearly two-thirds of public debts were the domestic debt which influenced significantly to economic outcomes. Their contribution can be summarized by following points. Firstly, they discovered that domestic debt held a substantial part of government debt for almost 64 cases in their research. Reinhart and Rogoff (2011a) found that long-term debt occupied a large proportion of total debt and lots of emerging countries must pay market-oriented interest rates on their own domestic debt. An interest rate was a tool for the government to reduce their domestic debt, but it was not reliable and favourite instrument according to data of Reinhart and Rogoff (2011a). Further, domestic debt should be local currency obligations and "foreign currency-

denominated". Private debt influenced significantly to sovereign default through low tax collections and liquidation problem. Both domestic and sovereign debt crises could happen together if bankruptcy institutions are weak (Arellano and Kocherlakota, 2014). When using inflation as a tool of domestic debt reduction, banking system and financial sector might get distortions from high inflation, especially with short-term or indexed debt (Reinhart and Rogoff, 2011a). In some cases, benefits from real debt decline might lower than the price of hyper-inflation. However, the government could gain "sovereign revenues off the monetary base" (Sargent, 1982) and domestic debt reduced naturally when the inflation rate was higher than the interest rate. Further, Reinhart and Rogoff (2011a) emphasized that "presence of significant pre-existing domestic debt" has been forgotten. The domestic debt was a leading factor, which increased government's incentive to inflate. They also suggested that active inflation was a right way for the government to deal with long-term domestic debt. However, it was limited instrument in case of short-term debt since interest rates could increase dramatically to adapt inflation. Further, bank reserve requirements, interest rate regulations or other monetary instruments needed to be taken into account in policymaking.

Secondly, they explained "an extraordinary policy" likely a country with "high public debt" policies in low debt threshold countries. They found that lots of countries faced default situation, although they had very low external debt thresholds. Reinhart *et al.* (2003) found a "serial defaulters" with debt to GDP below 60 percent, meaning still in control following Maastricht Treaty, but they had defaulted. The reasons here were that they did not include domestic debt in their calculation, while in tranquil periods, the role of domestic debt was as important as foreign debt (Reinhart and Rogoff, 2011a). This exclusion distorted debt status of the sovereign (during 1800-2008, external debt to government revenue ratio was 2.38, while this number was 4.21 with total debt). Further, domestic and external debts could also happen together as mentioned before (Aguiar and Gopinath, 2007). Thirdly, Reinhart and Rogoff (2011a) mentioned the lack of transparency in both governments and international agencies in providing entirely data on domestic debt. The national debt was also a good in the secondary market, but global investors did not seem to concern about its history information, while it was usually necessary reference channel in consumption decision. This shortage was also serious for policymakers in detecting crisis risks and problem within their own economy. Further, many governments did not want to publish their data on domestic debt and the role of this debt was not appropriately considered. Although data of Reinhart and Rogoff (2011a) covered only central government debt, lack of long-term dataset and non-classified, it also described the whole picture of domestic debt and its potential impacts on the sovereign debt crisis, while previous studies did not mention. Reinhart and Rogoff (2011a) also raised an important question about our weaknesses in analyzing public debt and underlined role of transparency mechanism in providing sufficient data on government debt. In general, external debt or domestic debt, both are still sovereign's obligations, and the government needs to try its best to manage. The study provides some solutions to control public debt in next chapter.

Solutions to reduce sovereign debt: In general, to reduce debt, the governments need to restrict borrowing money from foreign countries or institutions and try to development based

on their own resources. However, with under- and developing countries, it is hard to grow without help from the international community. Aids and support from international funds are necessary for evolution. Makhoul (2014) suggested several ways to dealing with debt when it reached dangerous levels. Firstly, the government can accelerate GDP growth. Improvement of national capacity can create more jobs, more production and earn more foreign currencies. The government can implement new policies to boost production, such as national marketing strategies, bilateral trade agreements or law reform for attracting more investments. However, promoting growth has never been an easy task. Secondly, sovereigns can initiate a fiscal austerity program. They can review all public spending and cut down non-essential expenses, reduce total employees, narrow welfare funds, increase taxes and other activities. It is an essential step to save the money although they may face with lots of frustrations. Thirdly, they can restructure debt. It is always useful method in short-time since it can bring sovereign more time to solve the economic problems. However, as Reinhart and Trebesch (2016) mentioned before, this not an effective long-term solution. Fourthly, boosting inflationary tendencies can be a useful tool to reduce public debt. It may work with long-term debt, but no longer correspond with short-term debt because of dramatic adaption of interest rate (Reinhart and Rogoff, 2011a). Fifthly, the government can apply financial repression by imposing caps on interest rates, restricting on cross-country financial transactions, tightening regulations on banks and borrowing from funds that are under government control such as public employee retirement funds and social security. It is popular solution applied by numerous governments. However, although financial repression helps by discouraging financial excesses, it can lead to distortions as taxes do at times. Further, it also creates public discontents and reduces living standard of citizens.

Another approach related to controlling mechanism for the borrower. Eichengreen (2003) supposed that one of the major reasons for the sovereign debt crisis was lack of international financial structure and controlling mechanism in providing financial support for development. This argument was supported by Lane (2012). Referring to European Debt Crisis, he mentioned about the ability to borrow money likely “free-rider problems”. So, an intensive and strict mechanism for financial regime or institution is necessary to prevent a sovereign debt crisis in the future. Financial organizations need to build more intensively international or regional standard for financial support programs. Additionally, after debt pre-crises happen, governments need stronger strategies to solve debt obligations. Firstly, they could make rescheduling, swap for long maturities and re-structure the debt (Kaiser, 2013; Miller, 2002). Debtors could negotiate with creditors to give them more time before the maturity date. They also could transfer a loan to a third party as an exchange investment budget. They also might restructure their debt and find external solutions for this (Miller, 2002). In the world, there are some financial institutions to help countries solve this problem, such as Paris Club or London Club. While Paris Club included 19 World’s largest countries and other big creditors, London Club was established by private creditors. In the global level, G7 also an active group in solving debt issues for emerging countries. The last solution to resolve the sovereign debt crisis is the IMF mandate. Initially, IMF was established with lots of function, and one of them is the supporting role for members in “special situations”, including debt crisis. A

country with chronic unbalances, and unsustainable debt can request supports from IMF. In this case, IMF can do by itself or encourages other financial institutions together providing a budget of money to help a nation keep their economy maintenance and recovery later. In return, IMF frequently requires receivers to reform their economy and implement emergency policies, such as cutting government spending dramatically, reducing minimum salary, the pension fund. IMF also encourages creditors to continue rescheduling debts towards long maturity, provide more chances and support for debtors. In general, requirements of IMF are stringent, demand forceful reform and lead a depression of living standard in short-term. However, as mentioned before, this solution could be the last movement in the worst case.

Conclusions

Financial supports or loans are the essential sources for the development of the sovereign, especially under- and developing countries. However, if governments did not use them effectively, the debt crisis can probably happen. In fact, there were lots of big sovereign debt crises in the history of humanity, and they influenced to citizens significantly. How a public debt crisis impacting on a sovereign is a debatable question, and leading theories provided mix results. Further, empirical evidence was insufficient and even provided opposite conclusions. Besides, debt relief was expected to improve economic performance, but it was still questionable. Additionally, the role of domestic debt in default was not well-appreciated. Using fixed effects panel regression and semi-parametric survival model with a new database, Cruces and Trebesch (2013) confirmed again that debt crisis influenced strongly negatively to later borrowing conditions and credit exclusion duration. These findings were reasonable and followed leading theories on public debt. However, keeping low haircuts was not always a good strategy, since sovereign might still have benefits from debt relief. By implementing comparison method and difference-in-differences regression, Reinhart and Trebesch (2016) confirmed that debt relief associated with higher growth, credit ratings, debt sustainability; while popular crisis solutions such as debt rescheduling, maturity extensions, bridge loan would not be effective instruments in long-term. In addition, in very first time, Reinhart and Rogoff (2011a) emphasized significant role of domestic debt in the sovereign debt crisis and provided detail explanation why lots of countries facing with the debt crisis in a low level of external debt. They also suggested how to use inflation as a tool in reducing domestic debt. Overall, policymakers need to know that debt crisis will lead to significant damage on economy and decline of future opportunities in the international environment. Although these consequences might be recovered partially through debt relief process, the price is still very high and need to be considered. Further, the domestic debt must include in calculating debt threshold, and governments need to build sufficient data on their debt with the most transparency. Last but not least, debt is always government’s obligations whether it is domestic debt or foreign debt. The government should try their best to use loan efficiently and implement reasonable solutions to keep the low public debt.

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