

AN AGENCY THEORY APPROACH TO SOVEREIGN DEBT CRISIS

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ABSTRACT

Governments are expected to be a stabilizing force when the economy is in trouble, but recently they are a source of chaos. The cause behind the sovereign debt crisis is debt that far exceeds a government's ability to repay. Why do governments of debt-ridden countries lose the sense of risk that unlimited accumulation of debt would bring their countries to the brink of insolvency? Economic factors alone can not provide a complete explanation. This paper combines agency theory with studies on public finance to develop a model to elucidate a government's behavior in public finance. We find that too much political concern underlies irresponsible fiscal policies. Enhancing the independence of budget offices and intensifying the transparency of public finance can be prescriptions to contain the reoccurrence of sovereign debt crisis.

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KEYWORDS: Budget Deficits, Deficit/GDP ratio, Sovereign Debt Crisis

INTRODUCTION

The subprime mortgage crisis wreaked havoc on the world economy, leading to the worst recession since World War II. Major financial institutions suffered mammoth loss from products and services related to subprime mortgages. Financial markets were in a state of panic, and the rising sense of risk prohibited market players with surplus funds from providing money to those in need. The credit crunch dragged on economic activities, and high unemployment and sluggish, even negative, growth were seen in major economic entities. Governments felt compelled and took actions to revive the almost collapsing financial system. They poured billions of dollars into financial markets to make sure that firms and consumers could gain access to credit needed for their investments and consumptions. A substantial part of the money was used to bail out too-big-to-fail financial institutions. They also increased expenditures with an aim to boost the recession-ridden economy. On the wane the financial crisis, alert investors felt shocked that some countries have accumulated debt to a level which many consider unsustainable. In some instances debt/GDP ratio reached historic highs, even over 100%. With escalating concerns over governments' ability to fulfill their obligations, panicked investors demanded higher risk premiums on government bonds, and the hike in interest payment aggravated governments' financial burden, worsening their ability to repay further. The lack of confidence in government bonds paved the way for the advent of the sovereign debt crisis. A government is expected to be a stabilizing factor when the economy is in distress, but this seemed not to occur.

It is widely believed that the financial tsunami caused by subprime mortgages triggered the outbreak of sovereign debt crisis. Paying bail-out money and increasing government expenditures, fiscal deficits and public debts in major economies escalated during the crisis. A question arises: why some countries undergo debt crisis and other remain intact? The financial condition of most debt-stricken countries had been deteriorating before the last financial crisis. For example, Greece, the epicenter of the sovereign debt crisis, had booked red government balances for many years. The country accumulated huge public debts, with a debt/GDP ratio over 100% before the financial crisis. Italy, the third largest economy in the European Union, also shared a record of high public liability and fell prey to the crisis. Budget deficits of these countries have continued for a long time, and their reliance on debt issues became so heavy that fiscal adjustments were needed. But governments chose to ignore the fact and speculated that they could pass the debt problem during their tenure. When the last financial crisis arrived, governments afflicted with high debt found they had no capacity to play the economic role expected. The last financial crisis was the last straw that broke the camel's back.

We start our analysis with the argument that the sovereign debt crisis is a political agent problem. A government is managed by a group of elected elites. They, like other agents in the economy, seek to maximize their own interests. The policies they pursue are intended to win public support with which allows them to accumulate power. Government spending and taxes are part of the tools they use. We include this political concern into our model and explore how public finance moves with such concern. We find that when competition from rivals is so intense that the margin of victory over the opposition is small, for winning ruling power, policymakers may be induced to be bold in public finance. When the interests of these elected elites diverge from national interests, the policies they take may be pernicious to the long-term value of a country. The sovereign debt crisis is de facto a conflict of interest problem between political agents and the country they serve. We integrate agency theory with studies on public finance to provide an alternative explanation for why a government is inclined to run deficits. The aim of the paper is to contribute to the understanding of government behaviors in public finance and to think of ways to prevent a repeat of sovereign debt crisis.

In the following section we review the related literature on public finance. Next an innovated model is intended to elucidate why a government tends to run deficits will be developed in section 3. The attitude of a political agent toward budget deficits moves under the influence of compensation package for public servants, relative public support ratio, and the effort expended by the agent. The focus is directed to political concern influencing policymakers' decision-making in fiscal policy. In section 4 the model developed is used to investigate how politico-institutional factors exert their influence on a country's public finance. We summarize the main results and offer some suggestions with the aim to contain deteriorating public deficits in section 5.

LITERATURE REVIEW

Agents in the economy pay a great attention to their standing relative to peers within the same group. For example, investors care about their social status in terms of relative wealth (Bakshi and Chen, 1996); CEOs are avid to compare firm performance to competing firms in the same industry (Chang and Chen, 2011). The political elites eager for power need the support of people. More support relative to their rivals enhances those political elites' satisfaction as the possibility of gaining ruling power increases. So the paper involves a measure for relative support for a policymaker in the model, governing her/his tendency to fiscal deficits.

Governments in democracy must respond to what people want them to do. People give their support to those political agents who can create more wellbeing for them. Governments which fail to meet expectations of the public will be sanctioned in the future election. Literature on public policies shows there is a close correspondence between government actions and public preference (Holbot and Klemmensen, 2005, Monroe, 1995). Such political concern induces political agents contending for power to be extravagant in fiscal policies, even in a situation that public deficits worsen and fiscal consolidations are urgently needed. This is the politically induced inclination to public deficit in a democracy.

Literature has shown that economic factors alone can not explain why some countries, developing or advanced, get trapped in debt problems but others do not. Some politico-institutional factors, such as budget procedures, electoral systems, and political structures, have been offered to fill such a gap (Alesina and Perotti, 1999). Alesina, Campante, and Tabellini (2008) argued that procyclical fiscal policies in developing countries are a political agency problem. Corrupt governments in tandem with opaque budget processes are the main cause for large fiscal deficits seen in many developing countries. We diverge from their argument, and instead treat a political agent like other economic agents who try to maximize their interests. The conflict of interest between voters and policymakers leads to irresponsible fiscal outcomes. Budget institutions vary across countries. They are viewed as a determinant of differences in fiscal policies seen in different countries (De Haan, Moessen, and Volkerink, 1999). In Hallerberg and Von Hagen (1999) proportional representative systems in which a common pool problem becomes more severe tend to result in a large public debt; while governments under pluralist systems are more stable and decisive, the condition of public finance in those countries is consequently healthier.

In a coalition government, members coming from different parties are easily confined to their own interests. When these members are allowed to participating in the fiscal decision-making process, the final budget plan will definitely be reckless. A fiscal policy proposed by a single-party government in which there is less diversity among members can be made on a broader basis, and more attention can be directed to sustainability concern. When budgeting power is distributed to spending ministers within a government, the size of the budget will be augmented excessively; if the budgeting process is centralized, the prime minister or finance minister has a complete power to decide the budget size and allocation of funds to each sector of a government, the tendency to deficit can be more restrained. In general, both the weakness of a government (Roubini and Sachs, 1989) and the degree of government fragmentation (Kontopoulos and Perotti, 1999) have their roles in deciding how final fiscal outcomes develop.

MODEL

A government is led by a group of elected elites in democracies. Like other agents in the economy, these political elites have their own interests to satisfy. The ultimate goal for political agents is to win ruling power. They remain in office because people grant power to them. For securing their position of power, they have to manage policies and actions to win people's support. The likelihood of continuing their jobs for another term increases and their social status enhances if the support from people is high. These policymakers feel more satisfied as popularity for them goes up. We embed such political concern into the model developed here and investigate how such political concern affects a policymaker's attitude toward fiscal deficit.

For achieving the zenith of power, policymakers have to expend more or less effort, and in return they gain support from the public in tandem with a package of pay. Here we preclude the possibility of corruption, and no money by embezzlement will go to the policymaker's account. Based on the arguments made above, a utility function at time t for a representative policymaker, such as a president, prime minister, a minister in a government, or a legislator in the parliament, etc., takes the form of $H[s(y_t, \pi_t), p_t, a_t]$, in which $s(y_t, \pi_t)$ is a relative support ratio of a policymaker against her/his principal political rivals. When competition from political rivals is severe, the relative support ratio for a policymaker drops. Such ratio will rise as political competition subsides. So the relative support ratio can be regarded as a measure of competition for a policymaker against her/his political rivals.

We assume there are two sources generating such a support ratio. One comes from the income (or economic) factor y_t (*GDP* or disposable income) and the other from non-income (or non-economic) factors, π_t . These two factors are assumed to be independent from each other, $s(y_t, \pi_t)$ can be re-expressed as $s(y_t, \pi_t) = v(y_t) + v(\pi_t)$, where $v(y_t)$ contains the effect of income factor on support ratio and $v(\pi_t)$ involves the effect of non-income factor. When the economic growth of a country is remarkable, people with better life will grant more support to the government, resulting in a positive v_y . If the public has an increasing and concave utility function with respect to y , v_{yy} is expected to be negative. The effect of non-income factors on the relative support ration is uncertain. In general, more competition arising from non-income factors, like more political rivals (in a proportional representative electoral system) contending for the ruling power, leads to a lower support ratio, $v(\pi_t)$. The utility function for a political agent can then be rewritten as $H[v(y_t) + v(\pi_t), p_t, a_t]$ and its expected form at time t is

$$U[v(y_t) + v(\pi_t), p_t, a_t] = \int_{y^-}^{y^+} H[v(y_t) + v(\pi_t), p_t, a_t] f(y_t | a_t) dy_t .$$

where p_t is the compensation paid to the representative policymaker, a_t is the effort she/he expends, $f(y | a)$ is the density function of y given a , and y^+ and y^- are the maximum and minimum values for y , respectively. Such a utility function has at least second-order partial derivative with respect to each argument involved.

A rise in the relative support ratio contributes to the likelihood of securing the future position in the government and, therefore, increases the representative agent's utility. That is, the utility function is strictly increasing in relative support ratio with $U_v > 0$ and $U_o > 0$. We assume that an increment to the

level of satiation declines gradually as the support ratio for her/him goes up further. That is, the function is concave in public support with $U_{vv} < 0$ and $U_{vv} < 0$. Policymakers, like other agents in the economy, will feel happier when she/he gets more money income, leading to $U_p > 0$. We follow the argument in Holmstrom (1979) that more effort will shift the distribution of y to the right in the sense of first-order stochastic dominance, so U_a is expected to be positive. Assume that the preference structure for the political agent remains unchanged as more pay and/or effort move the utility to the upper level, the marginal utility with respect to public support from income factors decreases, that is, $U_{vp} < 0$ and $U_{va} < 0$.

A government will run a deficit when there is a temporary fall in revenues or more urgent money is needed for coping with adversary movements in economy. The government has to raise funds by means of borrowing or bond issuing to pay for the fiscal deficit, leading to an increase in the level of public debt. The debt issued for the time $t + 1$ must be large enough to cover the repayment of interest and principal of debt issued before as well as the budget deficit, that is, the budget constraint for a government is expected to be:

$$B_{t+1} = B_t(1+r) + G_t - T_t = B_t(1+r) + D_t, \tag{1}$$

where $D_t = G_t - T_t$ is the primary deficit, r is the interest rate which is assumed to be constant for simplicity of exposition, B_t and B_{t+1} is the stock of public debt at the beginning of time t and $t + 1$, respectively. We rearrange the terms in Equation (1) and the dynamic form of the budget constraint is thus obtained,

$$\Delta B_t = B_t r + D_t = B_t r + k_t y_t$$

where k_t is the deficit/GDP ratio at time t , and its continuous-time counterpart is

$$\frac{dB_t}{dt} = \dot{B}_t = B_t r + k_t y_t. \tag{2}$$

Unlike other literature on public debt, we assume that the tenure for a government in office is limited. We also assume that decision-making occurs at any moment of time, so the analysis is made in a continuous-time setting. Now the problem for a policymaker is to control economic performance by means of government expenditures and tax schedules to enhance the level of public support so as to

$$\max_{y_t, p_t, a_t} \int_{t=1}^T e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] dt, \tag{3}$$

subject to

$$\dot{B}_t = B_t r + k_t y_t.$$

We use the dynamic optimization method to solve the problem. With the above objective function and budget constraint, we obtain the Lagrangean as follows,

$$L = \int_{t=1}^T \{e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] - \lambda_t (\dot{B}_t - B_t r - k_t y_t)\} dt, \tag{4}$$

where λ_t is a Lagrangean multiplier for time t , leading to the Hamiltonian

$$H(\lambda, t, B_t, y_t) = e^{-r(t-1)}U[v(y_t) + v(\pi_t), p_t, a_t] + \lambda_t(B_t r + k_t y_t). \quad (5)$$

Now the Lagrangean can be rewritten as

$$L = \int_{t=1}^T [H(\lambda, t, B_t, y_t) + \dot{\lambda}_t B_t] dt - (\lambda_T B_T - \lambda_1 B_1), \quad (6)$$

where $\dot{\lambda}_t = d\lambda_t / dt$, λ_t and λ_T are the Lagrangean multipliers for time t and T in the order, and B_t and B_T are the stocks of public debt at time t and T , respectively.

The first-order conditions for the maximization of $H + \dot{\lambda}_t B_t$ is

$$\frac{\partial H}{\partial y_t} = e^{-r(t-1)}U_{v,y_t} + \lambda_t k_t = 0, \quad (7)$$

$$-\frac{\partial H}{\partial B_t} = \dot{\lambda}_t + \lambda_t r = 0, \quad (8)$$

$$\frac{\partial H}{\partial \lambda_t} = \dot{B}_t. \quad (9)$$

Rearranging Equation (7) we get

$$e^{-r(t-1)}U_{v,y_t} = -\lambda_t k_t. \quad (10)$$

From Equation (8) we can derive the time path for the Lagrangean multiplier starting from time t as

$$\lambda_t e^{-r(T-t)} = \lambda_T. \quad (11)$$

Combining Equations (10) and (11), we get

$$e^{-r(t-1)}U_{v,y_t} = -\lambda_T e^{r(T-t)} k_t. \quad (12)$$

Along the same line of calculation, we get a similar expression for time $t + 1$,

$$e^{-r t}U_{v,t+1} v_{y,t+1} = -\lambda_T e^{r(T-t-1)} k_{t+1}. \quad (13)$$

Divide Equation (13) by Equation (12),

$$\frac{U_{v,t+1} v_{y,t+1}}{U_{v,t} v_{y,t}} = 1 + \frac{\Delta k_t}{k_t}. \quad (14)$$

Take the Taylor's expansion of $U_{v,t+1} v_{y,t+1}$ around (y_t, π_t, p_t, a_t) , Equation (14) changes to

$$\frac{\Delta k_t}{k_t} = \left(\frac{y_t U_{vv,t} v_{y,t}}{U_{v,t}} + \frac{y_t v_{yy,t}}{v_{y,t}} \right) \frac{\Delta y_t}{y_t} + \frac{v_t U_{vv,t}}{U_{v,t}} \frac{\Delta v_t}{v_t} + \frac{p_t U_{vp,t}}{U_{v,t}} \frac{\Delta p_t}{p_t} + \frac{a_t U_{va,t}}{U_{v,t}} \frac{\Delta a_t}{a_t}, \quad (15)$$

where $\Delta k_t / k_t$ is the rate of change in the deficit/GDP ratio, measuring the inclination of a policymaker to budget deficits and determining the trend for the public finance of a country. A rise in $\Delta k_t / k_t$ exhibits that the policymaker is inclined to be extravagant in government expenditures, leading to an increase in budget deficits and, therefore, more public debts will be booked in the financial balance of a country. A

drop $\Delta k_t / k_t$ means that the policymaker tends to avoid running deficits, an improvement in a country's public finance will be expected and, therefore, a reduction of public debts will follow.

Equation (15) shows the attitude of the political agent towards budget deficits is closely related to economic performance and changes in the public's preference from non-income factors, the pay package for the policymaker, and the level of effort the policymaker expends. The following will explore the impact of these factors on the public finance of a country.

The Economic Growth and Public Deficit

We start our analysis with the relationship between economic performance and budget deficits. The effect of economic performance $\Delta y_t / y_t$ upon the public finance depends on the sign of its coefficient $(y_t U_{vv,t} v_{y,t} / U_{v,t}) + (y_t v_{yy,t} / v_{y,t})$. As we have stated that $U_{v,t} > 0$, $U_{vv,t} < 0$, $v_{y,t} > 0$, and $v_{yy,t} < 0$, the sign for the coefficient of $\Delta y_t / y_t$ is negative. When economic performance is good, the public enjoys a better life. More support will flow to the government, and the need for expansive fiscal policies as well as tax cuts diminishes. On the other hand, people in a good financial shape can afford more public spending cuts and unfavorable tax schemes needed in fiscal consolidation with aim to reverse worsening public finance. So a government will pay more attention to fiscal sustainability. On the contrary, when the economy of a country is sluggish, i. e., $\Delta y_t / y_t < 0$, to secure public support and maintain its ruling position, a government needs to inject more public funds to revive the economy or shore up collapsing financial markets, thereby mitigating sufferings of people and maintaining financial stability. The final fiscal outcome in case of economic downturn is that deficits in public finance worsen and accumulation of public debts increases. Ireland and Spain can be included in this case.

PROPOSITION 1: With other things being unchanged, economic growth generates more public support for a political agent in office, reducing the need for expansive fiscal policies and allowing more room for fiscal adjustments. The financial condition of a country tends to be healthier. On the contrary when the economy in trouble, a government is induced to run deficits and accumulate more debts.

Countries in OECD enjoy more or less economic growth before the financial crisis caused by subprime mortgages, but most of them still run budget deficits and depend heavily on debt financing. This is in conflict with the prediction of traditional literature on public finance that budget deficits go down when the economy moves up. There must be some other factors which influence government financial policies.

Non-Income Factors

A government has the ruling power because they get more support from people over its contenders. The aim of a government is to take actions and policies in a specific political and institutional system to respond to needs of the public in order to secure its ruling position. The actions and policies, including fiscal policies and tax scheme, generate different outcomes and reactions from the people. When the outcome of a policy threatens to damage a government ruling position, other policies aiming at winning back public support are needed. Perhaps, when people are dissatisfied with some political or diplomatic policies, an expansionary fiscal policy might be appropriate. More government expenditures or more transfers and subsidies are sometimes used to shore up public support. On the other hand, the existing political system and/or institutional structure may also impose some restrictions on public finance. A strong resistance due to a reduction in funds allocated to an interest group, who has critical influence on the election result, may put a brake on a fiscal consolidation intended to improve deteriorating budget deficits. In sum, political and/or institutional factors influence public finance through their effects on public support.

The term $(v_t U_{vv,t} / U_{v,t})(\Delta v_t / v_t)$ in Equation (15) incorporates the effect of non-income factors on the tendency of a government towards fiscal deficits. If non-income factors drive up public support, the level of the policymaker's utility moves up, that is $U_v > 0$. The marginal utility of a policymaker with respect to public support from income factors decreases at a higher level of utility given the preference structure for

the policymaker remaining unchanged, so $U_{vv,t} < 0$ and the coefficient of $\Delta v_t / v_t$ is negative. A rise in public support arising from factors other than income, that is, $\Delta v_t / v_t > 0$; for example, some achievements in diplomatic affairs or political reforms, then the inclination of a policymaker to running deficits reduces, bringing about an improvement in public finance. A drop in support due to non-income factors with $\Delta v_t / v_t < 0$, generates an incentive for a policymaker to use aggressive fiscal policies to make up for the loss in public support caused by non-economic policies.

PROPOSITION 2: *Non-income factors have their influence on fiscal deficits through public preference. When public support is driven up by the non-income factors, the need for the use of expansive fiscal policies disappears, contributing to an improvement in public finance. On the contrary, more government spending and tax cuts are used to fill the gap left by the loss in public support from non-income factors.*

The Effect of Pay and Effort

As we have shown that $U_{vp,t}$ is negative, so $p_t U_{vp,t} / U_{v,t} < 0$. A rise in pay, that is, $\Delta p_t / p_t > 0$, will reverse a policymaker's inclination towards budget deficits. Government officials, like other agents in the economy, will feel happier when they get more money earnings. A raise in pay means that the public are satisfied with what they've done. The hike in public support reduces the need to take expansive fiscal policy. This leads to an incentive for policymakers to restrain themselves from excessive spending and would be helpful to financial health for the country.

PROPOSITION 3: *With other things being the same, a hike in pay for a policymaker is helpful to restrain a policymaker from excessive public spending and reduce government debts as higher pay means more public support.*

As we have posed in the above that $U_{va,t} < 0$, and this leads to a negative $a_t U_{va,t} / U_{v,t}$, the coefficient of $\Delta a_t / a_t$ in Equation (15). All effort expended by a policymaker is intended to produce better government performance, thereby increasing public support. A hard-working government surely earns its popularity. More favor from the public leads to a higher level of utility for the agent as her/his position in power looks firmer. The need for the government to acquire more favor from the public by means of fiscal policies lessens. On the other hand, a responsible government will pay more attention to fiscal sustainability. So a positive $\Delta a_t / a_t$ will help a country's public finance develop into a better shape.

PROPOSITION 4: *If the relationship that more effort by a political agent brings in a good government performance exists, a hard-working government will be more responsible in public finance.*

The global economy was in an upturn before the last financial crisis, but some countries still booked red balances in public finance. The unpredicted result can be explained by intense political competition from non-income factors inducing those political agents to use expansive fiscal policies to woo public support. According to our model, the term $\Delta v_t / v_t$ in Equation (15) was negative, leading to widening budget deficits. When the last financial crisis emerged, for covering the loss in support from people who suffered terribly from the last crisis, governments increased public spending and injected bailout money to save those too-big-to-fail financial institutions. With a drop in y_t , $\Delta y_t / y_t$ in Equation (15) turned out to be negative. The final fiscal outcome was an enormous shortfall in public finance. For those countries already afflicted with huge debts, the additional fiscal burden from the last financial crisis severely weakened their fiscal sustainability and ability to fulfill their obligations. When worsening financial conditions of a country severely dented investors' confidence in its solvency, a sovereign debt crisis breaks out. The sovereign debt crisis is attributable to both income and non-income factors. The model developed here offers a complete explanation to how a sovereign debt crisis evolves.

POLITICO-INSTITUTIONAL FACTORS

Now we use the model to explore how those politico-institutional factors work. All the effects of politico-institutional factors are captured by the term $\Delta v_t / v_t$ in Equation (15), the relative support ratio

from non-income factors which measures the level of competition arising from non-income factors.

Electoral Systems

Proportional representation (PR) systems allow for more parties to contend for the ruling power. More contenders mean more competition. The relative support ratio for the political agent falls and $\Delta v_i/v_i$ in Equation (15) turns out to be negative when compared to other electoral system, resulting in a widening shortfall in public finance. Governments in PR systems are prone to deficit financing. On the other hand, austerity measures which are needed to cope with broadening financial imbalance will be excluded as they may provoke the public's fury and the possibility of electoral sanction increases. As public spending increases and fiscal adjustments is a taboo to governments, the unhealthy fiscal condition is often seen in countries in PR systems. Literature has proved such an expectation. In pluralist electoral (PE) systems the number of parties competing for the power is smaller when compared to the PR systems. As competition becomes less severe, the term $\Delta v_i/v_i$ in Equation (15) turns to be positive, generating an improvement in budget deficits. In PE systems, as politicians have more room and flexibility in fiscal planning, more attention will be directed to fiscal sustainability. The financial condition of a country in PE systems is more stable than the one in PR systems.

COROLLARY 1: Proportional representation systems are prone to produce budget deficits as political competition is more intense, and more sustainable fiscal policies are seen in pluralist electoral system with a relaxation in competition.

Political Structures

Coalition governments are typical of the PR systems. Such a government type consists of diverse parties that do not share the same political idea. Each party has its own political beliefs and has its own interests. Members in the government contend with one another for expanding their power base. So each member of a government faces competition not only from opposition parties but also from colleagues within the same government. Consequently, the relative support ratio from non-income factors in equation (15) for each political agent in a coalition government is lower compared to other political systems, resulting in a negative $\Delta v_i/v_i$ and positive $\Delta k_i/k_i$. That is, a coalition government more easily falls prey to fiscal deficits.

As for single-party governments, which are common in the pluralist electoral system, members in the government have the same political ideas and it is easier to reach agreements on policies. Less competition among members within the government also makes the government more rational about public finance. When compared to a coalition government, competition is less intense and $\Delta v_i/v_i$ is positive in Equation (15), so irresponsible fiscal policies seen in a single-party government are rare.

COROLLARY 2: A coalition government tends to pose debt problems while a single-party government is more rational about public finance.

Budgetary Institutions

Different rules and procedures governing the formulation, approval, and implementation of the budget result in varied fiscal outcomes. Suppose the budget preparation is decentralized to divisions of an administration. Each minister competes with other administration members for a limited budget share. For acquiring higher opinion of her/his performance from the public, each minister is induced to augment fiscal needs, then, she/he can obtain additional funding. The division budget plan is extravagant and the resulting fiscal result is an enormous debt burden. A minister is like a political agent in our model. As she/her feels compelled to exhibit better performance relative to other divisions in the same government, such intense competition leads to a lower support ratio, that is, the term $\Delta v_i/v_i$ in Equation (15) is negative. So the fiscal outcome of the decentralized budget process tends to be shortfall in budget. If lawmakers are also allowed to have power to influence the budget outcome, the financial condition of the country is expected to worsen.

When the budgetary process is centralized and the prime minister or finance minister is granted the power to decide the size and composition of the budget, the financial result for a country will be different. Each minister uses money allocated to get the work assigned done. The sensitivity of such a political agent to public preference becomes less acute with a lower value of $|U_{vv,t}/U_{v,t}|$ in Equation (15). The competition among ministers within the same government is less severe when compared to the decentralized budgetary process, generating a positive $\Delta v_t/v_t$. So the inclination of a minister to deficit is reversed. The budget plan in a centralized process is expected to be made on a broader basis, not just on the need for a division of a government. The competition from opposition parties, the priority of needs from each department, and sources of revenues, etc., will be considered when preparing the budget. A government in a centralized budgetary process will be more responsible in public finance than the decentralized one, but a drop in administrative efficiency should be mitigated by complementary measures.

COROLLARY 3: In a decentralized budget process government spending tends to be aggressive. Fiscal sustainability receives more attention in a centralized budgetary process.

The preceding corollaries do not have to hold all the time. As note earlier, what a political agent does is to seek public support to secure her/his ruling position. Such political concern is pervasive in both coalition governments as well as single-party governments. If such political concern dominates everything, especially when the competition among political agents is intense, fiscal sustainability might be sacrificed. Some countries in majoritarian systems, such as France, United Kingdom, and United States, etc, have run deficits for years and accumulated substantial public debts before the last financial crisis. The fiscal problem is global, not just confined to any particular political systems or budgetary processes. It is seen that debt-stricken governments hesitate to take necessary fiscal adjustments when financial imbalance for their countries is getting worse. The fear of losing power dulls governments' sense of risk that the continuance of deficit financing will sink their countries into insolvency. Governments build their power at the expense of fiscal sustainability. Too much political concern is the main cause of sovereign debt crisis. The sovereign debt crisis will haunt the world in a repeated manner if no measures are taken to contain such patron-client relationship between politicians and voters in democracies.

If a budget office can be isolated from political concerns, a budget plan coming out from such an organization could be made on a broader basis with more attention directed to the interest of a country and fiscal sustainability. When there is a temporary shortage of tax revenues or expansive government spending is needed in a situation of economic downturns, deficits financed by debt issuance are allowed. On the contrary, if financial condition for a country is deteriorating to the level that the fiscal consolidation is needed, some austerity measures are taken without hesitation. People would like to entrust the budgetary power to an organization that is independent of any politicians or political parties. Increasing independence of budget offices should be put at the top of the list in future fiscal overhaul.

Fiscal transparency should be also strengthened. The financial condition of a country could be made public to the people. When people know well the inflow and outflow of public finance, they can easily distinguish responsible fiscal policies from unsustainable ones. The more information people have, the more rational they can be about public finance. They will vote for those politicians or parties that are responsible in public finance. Any fiscal adjustments needed to reduce budget deficits will get more support from the public if necessity of such measures is justified by people based on their understanding of public finance. At the same time, those fiscal moves with only political motives will be disdained.

CONCLUSION

When most countries around the world worked laboriously to get out of the recession caused by the last financial crisis, the government debt problems broke out and almost sank the world economy into a double-dip recession. Governments are expected to be a stabilizing factor when the economy is in trouble, but rather have become a source of chaos. The literature has shown that some politico-institutional factors have their role to play in determining fiscal results, but each of those factors is concerned with only one or more aspects of public finance. Countries facing the same factors have different fiscal outcomes. Thus

explanations based on politico-institutional factors are incomplete.

The paper integrates agency theory with studies on public finance to present a model of the inclination for a government to budget deficits. The political concern to win ruling power increases the likelihood of irresponsible fiscal policies when there is intense competition from political rivals. For this reason a government runs deficits and accumulates large debts even when the economy is in an upturn. When a financial crisis falls on the economy, the paucity of a government’s capability to withstand an economic tsunami leads to the breakout of a sovereign debt crisis. If a budget institution is independent of any political influence, more attention is put on fiscal sustainability of a country as strong interference from political concerns subsides. More budget transparency and more support for responsible fiscal policies come from the people. So we suggest that enhancing the independence of budget institutions and intensifying budget transparency should be top priority to stave off sovereign debt crises in the future. The model developed here is intended to address the sovereign debt problem, but it can also be extended to analyze the conflict between public preference and government policies. For testing the validation of our model, an empirical study is needed. Some problems might arise as data on some variables in our model may be unobtainable. It needs more effort to make the model more empirically available, and this is the focus of our future research.

APPENDIX

(1) Budget constraint:

$$B_{t+1} = B_t(1+r) + G_t - T_t = B_t(1+r) + D_t$$

$$\Delta B_t = B_t r + D_t = B_t r + k_t y_t.$$

where k_t is the *deficit/GNP* ratio for time t .

The continuous-time counterpart to ΔB_t is

$$\frac{dB_t}{dt} = \dot{B}_t = B_t r + k_t y_t \tag{A1}$$

(2) The problem for a government is to

$$\max_{y, t \in [1, T]} \int_{t=1}^T e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] dt \tag{A2}$$

subject to

$$\dot{B}_t = B_t r + k_t y_t$$

(3) The Lagrangean:

$$L = \int_{t=1}^T \{e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] - \lambda_t (\dot{B}_t - B_t r - k_t y_t)\} dt$$

$$= \int_{t=1}^T \{e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] + \lambda_t (B_t r + k_t y_t) + \dot{\lambda}_t B_t\} dt - (\lambda_T B_T - \lambda_1 B_1). \tag{A3}$$

From (A3), Hamiltonian is thus obtained

$$H(\lambda, t, B_t, y_t) = e^{-r(t-1)} U[v(y_t) + v(\pi_t), p_t, a_t] + \lambda_t (B_t r + k_t y_t) \tag{A4}$$

and the Lagrangean can be rewritten as

$$L = \int_{t=1}^T [H(\lambda, t, B_t, y_t) + \dot{\lambda}_t B_t] dt - (\lambda_T B_T - \lambda_1 B_1). \tag{A5}$$

(4) One of the first-order conditions for the maximization of $H + \dot{\lambda}_t B_t$ for time t :

$$\frac{\partial H}{\partial y_t} = e^{-r(t-1)}U_{v,t}v_{y,t} + \lambda_t k_t = 0$$

$$e^{-r(t-1)}U_{v,t}v_{y,t} = -\lambda_t k_t \tag{A6}$$

(5) Another first-order conditions for maximization:

$$-\frac{\partial H}{\partial B_t} = \dot{\lambda}_t + \lambda_t r = 0$$

then $-r = \dot{\lambda}_t / \lambda_t$ and $\int_{j=t}^T -rdj = \int_{j=t}^T (\dot{\lambda}_t / \lambda_t) dj$. We can derive the following

$$\lambda_t = \lambda_T e^{r(T-t)} \tag{A7}$$

(6) Combine Equations (A6) and (A7), t

$$e^{-r(t-1)}U_{v,t}v_{y,t} = -e^{r(T-t)}\lambda_T k_t$$

$$U_{v,t}v_{y,t} = -e^{r(T-1)}\lambda_T k_t \tag{A8}$$

(7) Along the same line of calculation, a similar expression for time $t+1$ can be obtained as

$$e^{-r t}U_{v,t+1}v_{y,t+1} = -e^{r(T-t-1)}\lambda_T k_{t+1}$$

$$U_{v,t+1}v_{y,t+1} = -e^{r(T-1)}\lambda_T k_{t+1} \tag{A9}$$

(8) Divide (A9) by (A8),

$$\frac{U_{v,t+1}v_{y,t+1}}{U_{v,t}v_{y,t}} = 1 + \frac{\Delta k_t}{k_t} \tag{A10}$$

(9) Take the Taylor expansion of $U_{v,t+1}v_{y,t+1}$ around (y_t, π_t, p_t, a_t) ,

$$1 + \frac{\Delta k_t}{k_t} = \frac{1}{U_{v,t}v_{y,t}} \left\{ U_{v,t}v_{y,t} + [U_{vv,t}(v_{y,t})^2 + U_{v,yy,t}] \Delta y_t + U_{v\pi,t}v_{y,t}v_{\pi,t} \Delta \pi_t + U_{vp,t}v_{y,t} \Delta p_t + U_{va,t}v_{y,t} \Delta a_t \right\},$$

$$\frac{\Delta k_t}{k_t} = \left(\frac{y_t U_{vv,t} v_{y,t}}{U_{v,t}} + \frac{y_t v_{yy,t}}{v_{y,t}} \right) \frac{\Delta y_t}{y_t} + \frac{v_t U_{v\pi,t}}{U_{v,t}} \frac{\Delta v_t}{v_t} + \frac{p_t U_{vp,t}}{U_{v,t}} \frac{\Delta p_t}{p_t} + \frac{a_t U_{va,t}}{U_{v,t}} \frac{\Delta a_t}{a_t} \tag{A11}$$

where $\Delta v_t = v_{\pi,t} \Delta \pi_t$, is the change in relative support ratio caused by non-income factor.

REFERENCES

- Alesina F.A., R. Perotti (1999) “Budget Deficits and Budget Institutions,” in: James M. Poterba and Jürgen von Hagen (Eds.), “Fiscal Institutions and Fiscal Performance,” *University of Chicago Press*, p. 13-36.
- Alesina F.A., F.R. Campante, and G. Tabellini (2008) “Why Is Fiscal Policy Often Procyclical?” *Journal of the European Economic Association*, vol. 6(5), September, p. 1006-1036.
- Bakshi, G.S. and Z. Chen (1996) “The Spirit of Capitalism and Stock-Market Prices,” *American Economic Review*, vol. 86(1), March, p. 133-157.
- Chang, G.D. and F.W. Chen (2012) “CEO Behavior and Subprime Mortgage Crisis,” *The International Journal of Business and Finance Research*, vol. 7(3), p. 13-25.

De Haan, J., W. Moessen and B. Volkerink (1999) “Budgetary Procedures-Aspects and Changes: New Evidence for Some European Countries”, in: James M. Poterba and Jürgen von Hagen (Eds.), “Fiscal Institutions and Fiscal Performance,” *University of Chicago Press*, p. 265-300.

Hallerberg, M. and J. von Hagen (1999) “Electoral Institutions, Cabinet Negotiations, and Budget Deficits in the European Union,” in: James M. Poterba and Jürgen von Hagen (Eds.), “Fiscal Institutions and Fiscal Performance,” *University of Chicago Press*, p.209-232.

Hobolt, S.B. and R. Klemmensen (2005) “Responsive Government? Public Opinion and Government Policy Preference in Britain and Denmark,” *Political Studies*, vol. 53(2), p. 379-402.

Holmstrom, B. (1979) “Moral Hazard and Observability,” *The Bell Journal of Economics*, vol. 10(1), Spring, p. 74-91.

Kontopoulos, Y. and R. Perotti (1999) “Government Fragmentation and Fiscal Policy Outcomes: Evidence from OECD Countries”, in: James M. Poterba and Jürgen von Hagen (Eds.), “Fiscal Institutions and Fiscal Performance,” *University of Chicago Press*, p. 81-102.

Monroe, A.D. (1998) “Public Opinion and Public Policy, 1980–1993,” *The Public Opinion Quarterly*, vol. 62(1), Spring, p. 6-28.

Roubini, N. and J.D. Sachs (1989) “Political and Economic Determinants of Budget Deficits in the Industrial Democracies,” *European Economic Review*, vol. 33, May, p. 903-933.

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