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Fiscal Policy Issues in Korea after the Current Crisis

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Abstract

This paper examines fiscal policy issues in the Republic of Korea (hereafter Korea) after the 2009 global financial crisis, including the timing of fiscal policy responses, the effectiveness of expansionary measures, and the long-term implications for government debt. In order to evaluate more accurately Korea's fiscal response since late 2008, this paper conducts an empirical analysis using historical data from Korea and other countries and derives stylized patterns on counter-cyclicality of fiscal policy and its role in the recovery process. The analysis suggests that Korea's fiscal stimulus in 2009, while having contributed greatly to the economy's fast recovery, was unusually large compared with typical fiscal responses during economic downturns. This paper also investigates whether the rapid increase in Korea's fiscal debt burden is admissible in terms of long-term sustainability. Although existing evidence suggests that Korea's fiscal debt is still manageable, the sizeable deficit and the increasing trend in the debt to GDP ratio in recent years call for vigilance. The paper concludes with some suggestions for fiscal consolidation in Korea: a stricter practice of medium-term budget planning, expansion of automatic stabilizers and reduction of discretionary components, use of more comprehensive measures of government debt, and further reforms in the national pension system are discussed.

JEL Classification: E30, H50, H60

Contents

1. INTRODUCTION

This paper examines fiscal policy issues in the Republic of Korea (hereafter Korea) after the 2009 global financial crisis, including the timing of fiscal policy responses, the effectiveness of expansionary measures, and the long-term implications for government debt.

As in most other countries, fiscal policy turned expansionary in Korea after the onset of the current crisis. While government expenditure increased by 15% in 2009, revenues increased by only 2% in nominal terms. As a consequence, the consolidated budget balance and operational budget balance of the central government a share of gross domestic product (GDP), were -2.1% and -5%, respectively, in 2009, and they are expected to be -0.4% and -2.9%, respectively, in 2010. It is widely recognized that the sizeable fiscal stimulus has contributed to Korea's rapid recovery. For example, the International Monetary Fund (IMF) estimates that the fiscal stimulus added 0.9-2.8 percentage point to baseline GDP growth in the first half of 2009. In this paper, I attempt to summarize fiscal policy developments in Korea since last year and assess how effective fiscal policy has been in curbing the impact of the global crisis. In particular, I conduct an empirical analysis using historical data from the Republic of Korea and other countries and derive stylized patterns on counter-cyclicality of fiscal policy and its role in the recovery process. Using these patterns, I am able to evaluate more accurately Korea's fiscal response since late 2008. My analysis suggests that Korea's fiscal stimulus, while having contributed greatly to the economy's fast recovery, was unusually large compared with fiscal responses during other periods of recession.

To help us assess the possible long term implications of expansionary fiscal policy, I provide a review of existing studies on the sustainability of fiscal debt in Korea. Prior to the 1997–1998 Asian crisis, fiscal policy was not actively used as a stabilization tool in Korea, and thus fiscal deficits or government debt were not issues of primary concern. After the 1997–1998 Asian crisis, however, the trend changed and government debt started to increase rapidly. The current expansionary fiscal policy by the government will further accelerate this rising trend in government debt. I investigate whether the rapid increase in Korea's fiscal debt burden is admissible using conventional theoretical frameworks.

Moreover, I will attempt to assess what policy frameworks are needed to secure long-term fiscal sustainability in Korea. I suggest that implementation of more fiscal rules, such as automatic stabilizers and reforms in the national pension system, can be important.

2. RECENT TRENDS IN KOREA'S FISCAL BALANCE

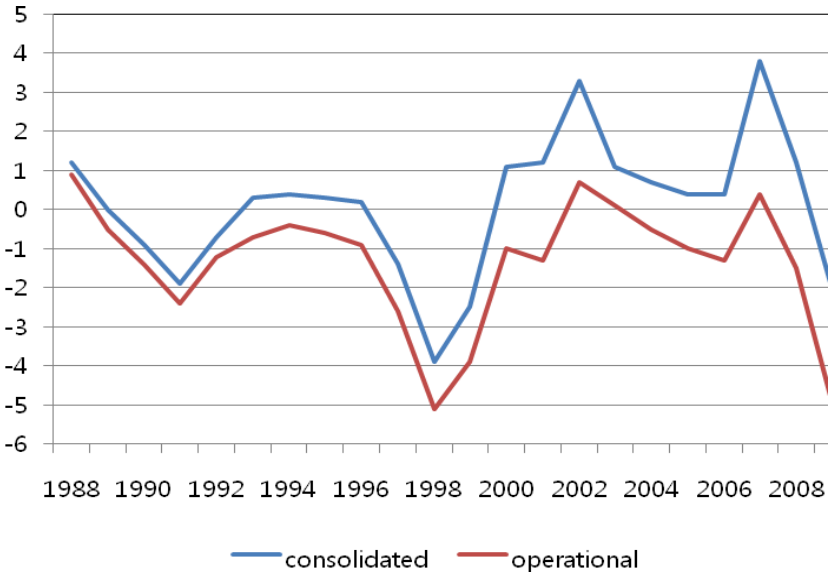
Korea's government budget has been largely in balance, except for the periods of the 1997–1998 Asian crisis and the 2008–2009 global crisis. In its management of the government budget, the Korean government put fiscal discipline above all else and followed the principle of "spending within budget." Other objectives of fiscal policy were subordinated to the fiscal balance management.

The fiscal stance was even briefly tightened immediately after the breakout of the Asian crisis in late 1997, in accordance with IMF guidelines, in order to improve current account balance and to stop further depreciation of the Korean won. In 1998, however, as the negative impact of the crisis turned out to be much more severe than had been expected, the Korean government and the IMF agreed to switch to an expansionary fiscal policy. A large proportion of fiscal expenditure during this period was used to bail out financial institutions in trouble. It is widely believed that the expansionary fiscal policy adopted during this period was particularly effective as it provided a stimulus to the economy through money and credit creation in addition to the traditional Keynesian multiplier effect (Lee, Rhee, and

Sung 2006). The sharp increase in the government budget deficit in 1998 and 1999 marked a structural break from the long time tradition of balanced budgets in Korea. This departure was made possible because the tradition of balanced budgets had kept government debt at low levels.

Figures 1 and 2 show the time series of Korea's government budget balance and government debt as percentages of gross domestic product (GDP). In Figure 1 presents both the consolidated budget balance and the operational budget balance of the central government. The operational budget balance, defined as the consolidated budget balance minus the social security balance plus redemption of public funds, is used for more rigorous evaluations of fiscal soundness.[1] As the figure shows, government budgets have been largely balanced in Korea, with the consolidated budget balance to GDP ratio and the operational budget to GDP ratio recording 0.2% and -1.15% on average, respectively. 1998 and 1999 were exceptional years in terms of the magnitude of the government budget deficit: the consolidated budget balance as percentages of GDP was -4% in 1998 and -2.5% in 1999. After 1999, the government budget balance to GDP ratio returned to its pre-crisis level.

Figure 1: The Fiscal Balance to GDP Ratio in Korea*

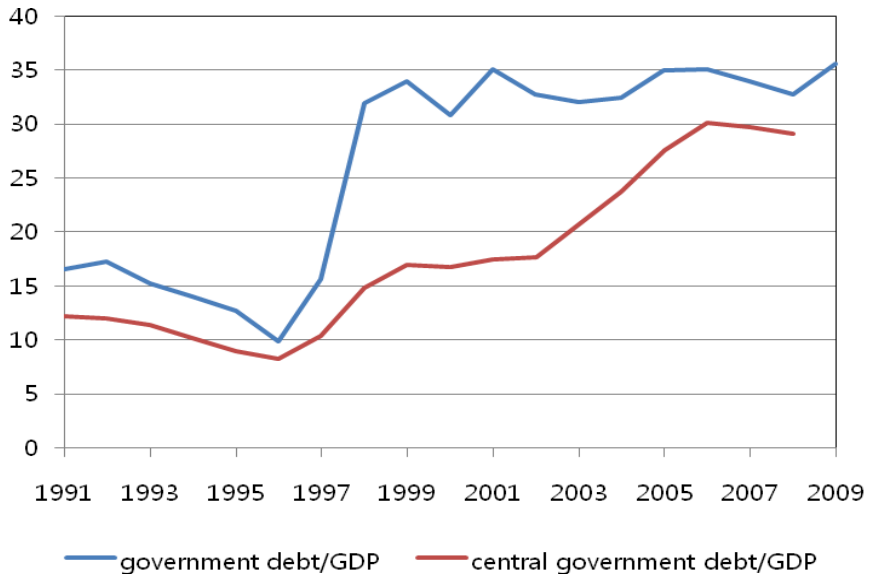


*Central government

Source: Ministry of Strategy and Finance

1 In Korea, the social security balance has been in surplus because the national pension system, which requires a minimum contribution period of twenty years for eligibility, has been accumulating surpluses since it was first introduced in 1988. The balance will, however, deteriorate quickly in the coming years as participants in the national pension system start to retire and become recipients of pension benefits. In fact, at the current contribution rate and the replacement rate, the pension system is expected to go bankrupt within a few decades. Hence, it may be misleading to include the social security account in the overall government budget.

Figure 2: The Fiscal Debt to GDP Ratio in Korea



Source: Ministry of Strategy and Finance

However, the fiscal balance to GDP ratio in Figure 1 may be misleading because, as Figure 2 shows, the fiscal debt to GDP ratio has been increasing quite rapidly since 1998. Fiscal debt of the general government jumped from 10% of GDP in 1996 to 34% of GDP in 1999 and has remained high ever since. For the central government, the increase in government debt was more gradual but equally large. By 2008, the central government debt to GDP ratio had increased to 29%, not much lower than the general government debt to GDP ratio. The discrepancy between Figures 1 and 2 arises because some components of government debt are not taken into account when calculating the government budget balance. For example, the Foreign Exchange Stabilization Bond issues by the central government to raise funds for stabilization of the foreign exchange market and the National Housing Bond used for public provision of housing services are taken into account when calculating government debt, but not in calculating the government budget deficit. Moreover, public funds that were raised during the Asian financial crisis through the issuance of bonds by the Korea Deposit Insurance Corporation and the Korea Asset Management Corporation were gradually turned into government debt starting in 2003. The rapid increase in central government debt in recent years has been caused by the expansion of these items.

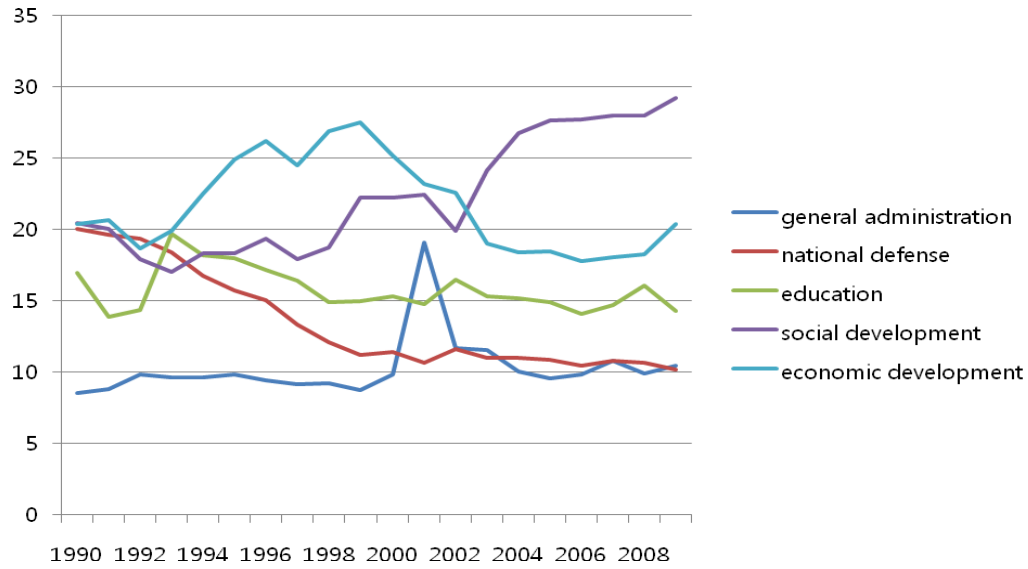
People have different views on the nature of these liabilities. Some argue that they can be offset by corresponding assets and thus the rapid increase in total fiscal debt may not be a serious problem. Others argue that poor management of the funds has incurred losses and therefore can pose a threat to long term fiscal stability. However, regardless of the nature of these particular liabilities, the true fiscal burden of the Korean government is likely to be substantially greater than Figures 1 or 2 may suggest. It is widely known that numerous quasi-fiscal accounts of public funds and public enterprises in Korea are not included in the IMF definition of fiscal debt (for example, Lee, Rhee, and Sung 2006). When these hidden liabilities are added, the fiscal debt figure increases substantially. For example, Ok (2007) argues that, with the liabilities of quasi-governmental bodies included, Korea's fiscal debt at the end of 2007 amounted to about 76% of GDP, almost twice the official figure.[2]

[2] Of course, other countries may have similar problems: under a more comprehensive definition of the government, the fiscal debt to GDP ratio may substantially increase in other countries as well. However, many people including OK (2007) seem to believe that the size of quasi-fiscal accounts omitted from the official data is particularly large in Korea.

In 2009, the Korean government ran another major deficit to contain the negative effects of the global financial crisis. Government expenditure increased sharply while tax revenues remained almost unchanged compared to 2008. Preliminary estimates indicate that Korea's consolidated central government budget balance as a % of GDP was -2.1% in 2009 and is expected to be -0.4% in 2010. The operational budget balance to GDP ratio was -5% in 2009 and is expected to be -2.9% in 2010. Due to the sizeable deficit, the fiscal debt to GDP ratio must have further increased in 2009. The Korean government estimates that the general government debt to GDP ratio increased from 32.8% in 2008 to 35.6% in 2009.

Most of Korea's fiscal stimulus was concentrated in the areas of social development and economic development. As Figure 3 shows, the share of expenditure on social development and economic development increased in 2009, while the share of education and national defense decreased at the same time. Social development includes public health, social welfare, housing, regional development, entertainment, etc., and economic development includes energy, industries, transport, communication, etc. These two areas take up almost 50% of total expenditure and also are to a greater extent subject to cyclical fluctuations than other areas. As can be expected, the share of these two areas exhibited a similar increase in 1998. The sharp increase in fiscal expenditure and the heavy focus on large-scale infrastructure investment have raised concerns about possible distortions in resource allocations. In particular, critics argue that the current Lee administration has a strong inclination towards fiscal expansion which may lead to waste of resources. For example, the Four Rivers Restoration Project, a multi-billion dollar project with the stated goals of preventing water shortages and promoting tourism, is being criticized by many as economically inefficient and environmentally harmful. The project may help boost the country's construction sector, but only at the expense of taxpayers.

Figure 3: The Composition of Fiscal Expenditures in Korea



Source: Ministry of Strategy and Finance

To summarize, favorable initial conditions of Korea in terms of fiscal debt and contingent liabilities enabled the government to adopt a large fiscal stimulus package in 2009 in response to the global crisis. However, this expansionary policy is likely to accelerate the already rapid expansion of Korea's fiscal debt.[3] The rapid increase in the fiscal debt to GDP ratio can be a serious threat particularly because a more comprehensive measure of

[3] Korea is not the only country that will witness a sharp increase in the fiscal debt/GDP ratio. In fact, according to IMF (2009b), most OECD economies are expected to see a similar jump in 2009 and 2010.

government liabilities that takes into account numerous quasi-fiscal activities in Korea would likely be substantially greater than the official figures indicate.

In the next section, I examine how Korea's fiscal policy in 2009 fares against typical policy reactions during economic downturns. To do so, I use historical cross-country data from a comprehensive set of countries including Korea. Through this empirical analysis, I intend to determine how counter-cyclical Korea's fiscal response was in 2009 compared with other periods of economic downturn in Korea and other economies. We have seen that most countries, including Korea, recorded substantial deficits in 2009. Strictly speaking, however, a fiscal deficit does not necessarily mean a discretionary expansion. Even without any active discretionary policy changes, the government budget balance would typically turn into deficit during economic downturns because of the existence of automatic stabilizers such as income tax and transfer payments. In other words, the government may record a government budget deficit during a recession simply because the economy is in such a bad shape. To make a proper policy evaluation, one needs to distinguish between cyclical components and discretionary components in fiscal variables and examine how the discretionary components changed during a particular economic downturn. The next section provides such analysis.

3. EMPIRICAL ANALYSIS OF POLICY RESPONSES AND RECOVERY

Most of this section's analysis is borrowed from Hong, Lee, and Tang (2010b).

3.1 Data

In my analysis, I investigate 21 developing Asian economies and 21 industrialized economies. While most previous studies on recessions and recoveries consider only developed economies (Claessens et al. 2008; IMF 2009a), this paper examines Asian developing economies as well to provide a more useful comparison with the Korean economy. The developing Asian economies in my sample include: the 10 Association of South East Asian Nations (ASEAN);[4] Bangladesh; People's Republic of China (PRC); Hong Kong, China; India; Kazakhstan; Korea; Kyrgyz Republic; Pakistan; Papua New Guinea; Sri Lanka; and Uzbekistan. The industrialized economies refer to 21 Organization for Economic Co-operation and Development (OECD) countries, namely Australia; Austria; Belgium; Canada; Denmark; Finland; France; Germany; Greece; Ireland; Italy; Japan; Netherlands; New Zealand; Norway; Portugal; Spain; Sweden; Switzerland; United Kingdom; and US. The sample period is from 1961 to 2008. The data set is unbalanced due to missing observations.

In dating recession periods, I use annual, not quarterly, real GDP figures from World Development Indicators and OECD. Quarterly GDP series for developing economies are very limited and not seasonally adjusted in most cases. For analyzing policy responses, we use changes in government consumption expenditure as a measure fiscal policy and changes in the call interest rate as a measure of monetary policy. Fiscal policy response is my main interest and monetary policy is considered mainly for controlling purposes. I use government consumption expenditure instead of a more standard measure such as primary balance because the latter has very low data availability, especially among developing Asian economies.[5] Both the call rate and government consumption are obtained from the

[4] ASEAN includes Brunei Darussalam, Cambodia, Indonesia, Lao People's Democratic Republic (Lao PDR), Malaysia, Myanmar, Philippines, Singapore, Thailand, and Viet Nam.

5 Also, they changed the accounting framework for government finance from cash basis to accrual basis around 2004. The switch from cash-basis accounting to accrual-basis accounting was recommended by the

International Monetary Fund's International Financial Statistics and OECD. The call rate is adjusted for inflation, where inflation is defined as annual growth in consumer price inflation.

3.2 Definitions of Recession and Recovery

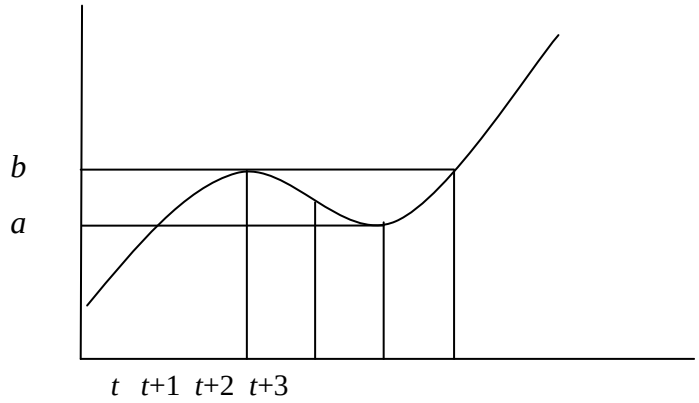
I first date peaks and troughs in GDP series based on the concept of "classical" business cycles which was formalized by Burns and Mitchell (1946) and later implemented in algorithm by Bry and Boschan (1971) and Harding and Pagan (2002). While relatively simple, this dating practice is known to closely match the business-cycle dates provided by the National Bureau of Economic Research (in the case of the United States) or other more complicated approaches. When applied to an annual series, Harding and Pagan's rule implies that period t should be defined as a trough if $x_t < x_{t+k}$, for k = -1 and 1, and a peak if $x_t > x_{t+k}$, for k = -1 and 1. In other words, any year of negative growth can be regarded as a recession or a downturn. Watson (1994) uses the same reasoning in his analysis of annual data. I apply this rule to my annual real GDP series.[6] Once peaks and troughs are dated, a recession is naturally defined as the period that lies between a peak and the following trough. The duration is simply given by the length (number of years) of a recession, and the amplitude by the peak-to-trough fall in the logarithmic value of the series. According to these definitions, the sample probability of recession is 8.4% for OECD and 9.9% for developing Asia. Also, the average duration of a recession is 1.3 years for OECD and 1.5 years for Asia, while the average amplitude is -1.7% for OECD and -6.3% for Asia. For the Korean economy, the recession probability is only 4%: Korea has experienced only two recession episodes during the whole sample period and each one lasted for one year. The amplitude of Korea's recession was -4% on average.

It is less straightforward to define a recovery, because people seem to use the word "recovery" to imply many different things. In this paper, I use the following two definitions: (1) the time length until recovery to previous peak, and (2) the growth rate during the first year of recovery. The first definition measures how long GDP, after hitting a trough, remains below the previous peak. The second definition measures the GDP growth rate during the one year period that immediately follows a trough. These are the same definitions as those used in World Economic Outlook by IMF (2009a). Figure 4 illustrates an example. In the example, the series reaches a peak in period t and a trough in period t+2. The duration of the downturn is thus 2 and the amplitude ab. After hitting a trough in period t+2, the series recovers the value of b in period t+3. Thus, the time until recovery to previous peak is 1 (or t+3 minus t+2), and the growth during the first year after the trough is also ab.

Government Finance Manual 2001 of the International Monetary Fund (IMF). The newly constructed government finance data are available only for 1990 and afterward, while the old series are available only up to 2001. The two series are not consistent with each other and thus cannot be combined.

6 It is clear that we do not need a separate censoring rule for annual series, because a complete cycle (from peak to peak) will always take at least 2 years, which is greater than 5 quarters.

Figure 4: Definition of Recession and Recovery



Source: author's illustration

3.3 Definitions of Policy Responses

A difficulty in measuring policy responses is to distinguish between discretionary changes in policies and the component of policies that automatically responds to economic fluctuations. Government spending, for example, is largely constrained by government revenue which in turn is determined by economic activity. Consequently, government spending tends to decrease during recessions even when the government switches to an expansionary stance by running deficits. In order to properly evaluate discretionary policy responses by the government, one needs to control for the automatic positive correlation between government consumption and GDP that may originate from income elasticity of tax revenue. In this paper, I address this problem by making cyclical adjustments for policy variables using a simple regression framework. More specifically, to cyclically adjust government consumption, I estimate the following equation separately for each of the developed-economy group and the developing-economy group:

$$\text{government consumption gap}_{i,t} = \beta_0 + \beta_1 * \text{GDP gap}_{i,t} + e_{i,t}, \quad (1)$$

where government consumption gap and GDP gap are residuals from Hodrick-Prescott filtering of logarithm of government consumption expenditure and logarithm of GDP, respectively.[7] Cyclically adjusted government consumption is given by the residual in equation (1).[8] It can be regarded as a measure or proxy of discretionary fiscal policy, with a positive value indicating an expansionary stance.

For the call interest rate, the following equation is estimated for each of the developed-economy group and the developing-economy group:

$$\text{real interest rate}_{i,t} = \gamma_0 + \gamma_1 * \text{GDP gap}_{i,t} + \gamma_2 * \text{inflation}_{i,t} + \gamma_3 * \text{dummy\_85}_{i,t} + \varepsilon_{i,t}, \quad (2)$$

where dummy_85 is a dummy variable that takes the value of 1 for periods after 1985. It is included to allow for a possible structural shift in the equilibrium interest rate. A cyclically adjusted interest rate is given by the residual in equation (2). Since equation (2) corresponds

[7] A smoothing parameter of 6.25 is used for an annual series and a parameter of 1600 is used for a quarterly series..

[8] To reduce endogeneity bias, we use instrumental variables estimation for the government consumption equation, with one year lagged value of GDP gap used as the instrument.

to the Taylor rule for monetary policy, a positive deviation from the rule can be regarded as a discretionary tightening of monetary policy.

Now, using cyclically adjusted policy variables obtained from equations (1) and (2), I can measure the policy response over the course of a recession. Specifically, I define the policy response as the cumulative sum of changes in the cyclically adjusted policy variable during a recession period (from a peak to the next trough).

3.4 Stylized Facts

I first cite some summary statistics about recovery from Hong, Lee, and Tang (2010b). As Table 1 shows, the average time until recovery to the previous peak is 1.89 years for developing Asian economies while only 1.44 years for OECD economies. The slower recovery in Asia can also be seen from Figure 5, which illustrates the probability that an economy will remain below the previous peak beyond a certain number of years. The probability to "survive" (to remain below the previous peak) is estimated using a Weibull distribution. It is clear from Figure 5 that the survival function takes consistently higher values for developing Asia. For example, the probability to "survive" (to remain unrecovered) two years after the trough is about 50% for developing Asia and about 40% for OECD. Using the same sample of countries, Hong, Lee, and Tang (2009a) reported that both the duration and the absolute magnitude of the peak-to-trough amplitude are greater for developing Asia. Table 1 and Figure 5 indicate a recession is not only longer-lasting and more severe but also harder to overcome in developing Asia. The median length of time to recovery, however, is equally 1 year for both regions, suggesting that developing Asia has witnessed a few exceptionally slow recoveries in the past.

Table 1: Recovery from a Recession

	Mean	Median	Standard deviation
OECD			
Time until recovery to previous peak[1]	1.44	1.00	1.00
Growth during the first year of recovery[2]	2.92	2.51	1.99
All-time average growth	3.33	3.24	2.53
Developing Asia			
Time until recovery to previous peak[1]	1.89*	1.00	1.73*
Growth during the first year of recovery[2]	5.25	4.00	3.64
All-time average growth	5.49	5.80	4.87

Source: Hong, Lee, and Tang (2010b)

Note: All-time average growth refers to the average growth rate over the entire sample period.

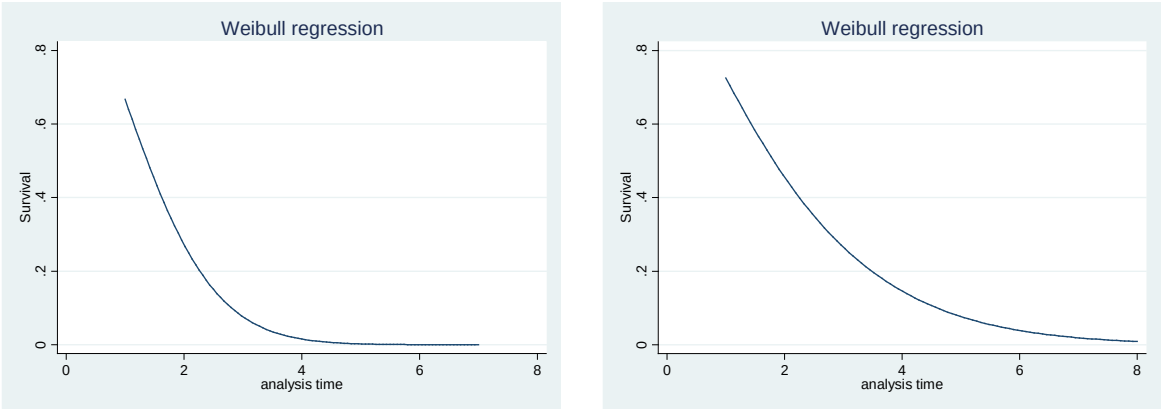
* The 1979-1981 recession of Brunei Darussalam is excluded. The recovery to previous peak took 21 years in this particular case.

[1]Number of years.

[2]%.

Figure 5: Probability to Remain Unrecovered

OECD Developing Asia



Source: Hong, Lee, and Tang (2010b)

My second measure of recovery, the GDP growth rate during the first year of recovery, is 5.25% for developing Asia and 2.92% for the OECD countries. As mentioned above, Hong, Lee, and Tang (2009a) report that the peak-to-trough drop is also sharper in developing Asia. Taken together, these results imply that the developing Asian economies experience a steep downturn but recover quickly.. This may seem to contradict the aforementioned patterns in the time until recovery and the survival function. I note, however, that the two regions have very different potential growth rates as shown in Table 1, the all-time average of GDP growth is 3.33% for the OECD and 5.49% for developing Asia.[9] When this fixed difference in the potential growth rate is accounted for, my second recovery measure does not show much difference between the two regions. For Korea, the first measure of recovery is one year and the second measure of recovery is 7.5%.

Next I present some findings about policy responses from Hong, Lee, and Tang (2010b). As explained above, I define policy responses as the cumulative sum of changes in cyclically adjusted government consumption or cyclically adjusted call interest rates. Thus, a positive value for fiscal policy corresponds to an expansionary stance while a positive value for monetary policy corresponds to a contractionary stance. Table 2 shows how fiscal and monetary policies have responded to recessions in OECD and developing Asia.[10] I find that discretionary changes in government consumption have been significantly positive during recessions in both the OECD and developing Asia, with growth rates of 2.2% and 3.9%, respectively. Clearly, this does not necessarily mean that actual government consumption increases during a recession. With no cyclical adjustment, government consumption may well exhibit negative growth during a recession as fiscal revenues decrease. Indeed, cumulative government consumption growth during a recession turns out to be -0.5% for developing Asia and 2.7% for the OECD in my sample. Fiscal policy measures in Table 2 only indicate that government consumption during a recession tends to decrease less than is implied by the simple income elasticity. Also note that the difference in the fiscal policy measure between OECD and developing Asia does not necessarily imply that Asian governments have been more counter-cyclical on the whole. The fiscal policy measure may be larger in Asia because automatic stabilizers in the region are relatively small and thus need to be supplemented by discrete government spending.

9 The average growth rate during the first year of recovery is not much influenced by the 1979-1981 recession of Brunei Darussalam.

10 I identify and exclude outlier observations before computing the policy measures reported in Table 2. Outliers in each variable are identified using the method developed by Hadi (1994). Stata provides the routine for this procedure.

Table 2: Policy Responses

	Mean	Median	Standard deviation
OECD			
Fiscal policy[1]	2.18**	2.29**	2.31
Monetary policy[2]	-0.58*	-0.73**	2.48
Developing Asia			
Fiscal policy[1]	3.85**	3.41**	4.84
Monetary policy[2]	-0.65	-0.79	3.56

Source: Hong, Lee, and Tang (2010b)

Note: * and ** denote significance at the 10% level and the 5% level, respectively. Monetary policy is based on the cyclical adjustment of the interest rate that uses GDP gap, inflation, and dummy_85 as controlling variables.

[1]% changes from peak to trough.

[2] Percentage point changes from peak to trough.

In contrast to fiscal policy, the monetary policy response is significantly different from zero only in OECD economies. According to table 2, the cumulative decrease in the cyclically-adjusted call rate during a recession is about 0.58 percentage points for OECD. And it is significantly positive at the ten % level.[11] For developing Asian economies, the cumulative change in the call rate is not significant even if negative, suggesting that monetary authorities in Asia may not have been as active in changing the interest rate to moderate the effects of a recession.

Korea's policy responses during the two recession episodes in 1980 and 1998 have been greater than the international average: the fiscal policy response was 11.2% and the monetary policy response was -1.55 percentage points.

3.5 Policy Responses and Recovery

In this section, I examine whether the counter-cyclical policy responses play an important role in the recovery process. To achieve that goal, I first estimate the following equation that relates GDP growth during the first post-trough year to policy responses and control variables:

$$\text{GDP growth during the first year of recovery}_{i,t} = \delta_0 + \delta_1 * \text{fiscal policy}_{i,t} + \delta_2 * \text{monetary policy}_{i,t} + \delta' X_{i,t} + \eta_{i,t} \quad (3)$$

The unit of observation in equation (3) is each recession episode and thus the subscript *i*,*t* denotes recession *t* in country *i*. The policy measures used here are the same with those in Table 2 and the vector of control variables *X* includes the peak-to-trough amplitude of a recession and policy variables of Japan. The peak-to-trough amplitude is included to control for possible interrelation between the severity of a downturn and the pace of subsequent recovery. To the extent that there is overshooting in the initial drop, a greater fall will tend to be followed by a sharper recovery in the following periods. Also, since Japan is a leading economy in Asia, the macroeconomic policy stance of Japan may have important implications for the recovery of other economies in the region. Japan's policy stance is measured by the changes in cyclically adjusted interest rate and government consumption

[11] Although not reported in the table, we have used quarterly data for OECD economies and found that both fiscal and monetary policies turn expansionary during a recession in OECD.

expenditures in the year immediately preceding a trough. Equation (3) is estimated using a panel model with fixed effects in order to control for cross-country differences in the potential growth rate and other country-specific effects.

In addition to equation (3), I estimate the following equation that specifies the probability density of recovery as a Weibull function:

$$\text{probability density of recovery}_i = f(t_i, z_i) = \gamma e^{\beta' Z i} t_i^{\gamma-1} \exp(-e^{\beta' Z i} t_i^{\gamma}) \quad (4)$$

In my definition, a recovery is achieved when GDP, after hitting a trough, recovers to the previous peak value. Thus, the event time t_i denotes the time when GDP recovers to its previous peak in the recession episode *i*. z_i and β are the covariate vector of recession *i* and the corresponding coefficient vector, respectively, and γ is the shape parameter of the distribution. The covariate vector *z* includes the same explanatory variables as in equation (3), i.e., the peak-to-trough amplitude of a recession and policy variables of Japan. Again, the unit of observation is each recession episode rather than a country-year.

I first estimate equation (3) using GDP recessions from OECD and developing Asia and provide the results in columns (1) and (2) of Table 3. I consider the two regions at the same time in order to maximize the number of observations. When considered separately, Asia has only 19 recession episodes that have no missing values in the policy and control variables. However, since the main goal of the analysis is to derive implications for Korea, I also estimate equation (3) using only the Asian sample and report the results in column (3). Fortunately, despite the small number of observations, estimation results from the Asian sample are not much different.

Column (1) shows that, for the whole sample, fiscal policy has a significantly positive effect on the pace of recovery. The estimated coefficient (about 0.3) implies that a one standard deviation increase in the fiscal policy measure (about 3.4 percentage points) leads to a 1 percentage point increase in the GDP growth rate. The IMF (2009a) has shown, using quarterly data for the OECD economies, that the fiscal policy response is important for the strength of recovery. Applying the same approach to annual data from OECD and developing Asian economies, I confirm the IMF's finding that counter-cyclical fiscal policy helps promote recovery. In contrast to fiscal policy, monetary policy does not seem to have a systematic effect on the post-trough growth: the coefficient on the monetary policy measure is close to zero and insignificant. The coefficient on the absolute value of amplitude is significantly positive, indicating that the economy tends to recover more rapidly following a greater initial fall.[12]

12 IMF (2009a) reports the opposite: they use the peak-to-trough amplitude without any transformation and still obtain a positive coefficient. It is not clear where the discrepancy between IMF (2009a) and our result stems from. We have examined quarterly data for OECD countries following IMF (2009a) and still found that a greater fall is associated with a faster recovery.

Table 3: GDP Growth during the first year of recovery

	(1)	(2)	(3)
Fiscal policy	0.32** (2.80)	0.38** (3.53)	0.38** (2.03)
Monetary policy	-0.09 (-0.73)	-0.01 (-0.05)	0.73** (-2.17)
Log(-amplitude)	0.47** (2.01)	0.37* (1.68)	0.45 (0.36)
Fiscal policy of Japan		0.08 (0.47)	-0.43 (-0.42)
Monetary policy of Japan		-0.41** (-2.98)	-1.10** (-2.58)
# of obs.	73	73	19

Source: author's calculations.

Note: The dependent variable is the GDP growth rate during the first year after a trough. Panel estimation with fixed effects. *t*-ratios are in parentheses. * and ** denote significance at the 10% level and the 5% level, respectively.

In column (2), I add Japan's policy variables and find that the monetary policy of Japan has a significant effect on other countries' recovery. The coefficient indicates that a 1 percentage point decrease in cyclically adjusted interest rate in Japan is associated with a 0.4 percentage point increase in the post-trough GDP growth rate in other countries. Although not reported in the table, when examining fiscal and monetary policies of the United States and Germany, I find that none of the foreign policy variables has a significant effect. This is not entirely surprising, because my sample is heavily representative of Asian economies that have strongest economic ties with Japan. However, one may still wonder exactly how a lower interest rate in Japan promotes recovery in other countries when it has not been particularly successful in providing a boost to the domestic economy. One possible explanation is that an increase in the supply of Japanese Yen may be associated with increased international capital outflows. For example, a lower interest rate in Japan encourages other countries to increase their borrowings from Japan. The increased borrowings in turn will result in an easing of financial conditions in those countries, thereby stimulating economic activity. Hong and Lee (2009) provide an example to support this argument. By applying the business cycle dating methodology of Harding and Pagan (2002) to Japan's domestic credit, they report that Japan appears to have experienced a major credit contraction between the fourth quarter of 1996 and the first quarter of 1998, just before the onset of the 1997–1998 Asian crisis. This suggests that tight credit conditions in Japan may have been a partial cause of the Asian crisis.

In column (3), I examine how the estimation results change when only Asian recessions are used in the estimation. Column (3) shows that, despite the small number of observations, coefficients on macroeconomic policy variables are still significant and of the right sign. In particular, the coefficient on fiscal policy is significantly positive and of a similar magnitude as before. Also, unlike in columns (1) and (2), monetary policy now has a significantly negative coefficient, consistent with common expectations. Overall, Table 3 supports the view that expansionary policies, particularly expansionary fiscal policies, have been effective in promoting recovery from economic recession in Asia.

I now estimate equation (4) and provide the results in Table 4. As before, columns (1) and (2) use GDP recessions from the OECD and developing Asia collectively, while column (3) considers only Asian recessions. Since equation (4) specifies the probability of recovery (or the hazard of exiting a recessionary state during which GDP remains below the previous peak), a variable with a positive coefficient should be interpreted as promoting recovery. Estimates reported in Table 4 denote coefficients rather than hazard ratios. Results in Table

4 are broadly consistent with those in Table 3. First, in all specifications, the coefficient on fiscal policy is significantly positive while the coefficient on monetary policy is insignificantly different from zero. Second, the coefficient on the absolute value of amplitude is always significant and negative, indicating that the larger the initial drop is the longer it takes to recover. Note that this is not necessarily inconsistent with the positive coefficient on the same variable reported in Table 3. For a recession with a large peak-to-trough drop, it is entirely possible to have a high post-trough growth and yet not to recover to the previous peak quickly. Third, when significant, an expansionary policy in Japan promotes recovery in other countries. As columns (2) and (3) show, either a decrease in Japan's interest rate or an increase in Japan's government consumption is associated with a higher probability of recovering from a recession.

Table 4: Probability of exiting a recession

	(1)	(2)	(3)
Fiscal policy	0.19** (4.18)	0.24** (4.90)	0.33** (3.59)
Monetary policy	-0.07 (-1.47)	-0.05 (-1.06)	-0.06 (-0.86)
Log(-amplitude)	-0.62** (-7.55)	-0.67** (-8.01)	-0.49** (-2.84)
Fiscal policy of Japan		0.10 (1.28)	0.48** (2.44)
Monetary policy of Japan		-0.24** (-3.26)	0.01 (0.06)
# of obs.	73	73	19

Source: author's calculations.

Note: The probability density of recovery is assumed to follow a Weibull distribution. *z*-ratios are in parentheses. * and ** denote significance at the 10% level and the 5% level, respectively.

Tables 3 and 4 show that an expansionary macroeconomic policy can curb negative effects of a recession in the short run. The medium-term effect of the policy, however, is not known. Considering the time lag between a policy action and its influence on the economy, an expansionary action may continue to stimulate the economy several years later. On the other hand, an expansionary policy may entail an increase in fiscal burden or inflation, which in turn may increase the possibility of a recurring recession. In order to examine the medium-term implications of an expansionary macroeconomic policy, I estimate the following probit equation that specifies the probability of a recurring recession as a function of short-term policy responses and control variables:

$$\text{probability of recurrence}_i = \Phi(\alpha_0 + \alpha_1 * \text{fiscal policy}_i + \alpha_2 * \text{monetary policy}_i + \alpha' X_i + \eta_i), \quad (5)$$

where Φ is the cumulative normal distribution function and the subscript *i* denotes recession *i*. I define a recurring recession as a recession that takes place within five years of a trough. Using this definition, the probability of recurrence is 0.28 for the whole sample and 0 for Korea. I report the estimation results of equation (5) in Table 5. As before, columns (1) and (2) use the whole sample while column (3) uses only the Asian sample. One of the most robust results in Table 5 is the significantly positive coefficient on the monetary policy measure. This result indicates that a greater decrease in the interest rate made during the initial GDP downturn tends to lower the probability of another recession during the five years following the trough. Fiscal policy, on the other hand, is not particularly important in the medium term. As will be shown later, a fiscal expansion typically results in a persistent increase in fiscal debt. Table 5 suggests that, at least in the medium term, this negative side-effect of a fiscal expansion does not have a direct influence on the economy.

Another robust finding in Table 5 is the significantly negative coefficient on the absolute value of amplitude. This indicates that a downturn with a large amplitude (in absolute terms) is less likely to be followed by another downturn within the next five years. In other words, the economy may become more resilient to a negative shock after going through a severe recession. Policy variables of Japan are all insignificant and need no further comment.

Table 5: Probability of a recurring recession

	(1)	(2)	(3)
Fiscal policy	0.02 (0.33)	0.01 (0.21)	-0.03 (-0.35)
Monetary policy	0.16** (2.24)	0.19** (2.41)	0.66** (1.97)
Log(-amplitude)	-0.27** (-2.21)	-0.31** (-2.37)	-0.24 (-0.86)
Fiscal policy of Japan		-0.19 (-1.38)	0.61 (1.44)
Monetary policy of Japan		-0.02 (-0.22)	0.91 (1.45)
# of obs.	73	73	19

Source: author's calculations.

Note: Probit estimation of the probability of a recurring recession. The recurrence is defined as another recession that occurs within five years. *z*-ratios are in parentheses. * and ** denote significance at the 10% level and the 5% level, respectively. Monetary policy 1 is based on the cyclical adjustment of the interest rate that uses GDP gap, inflation, and dummy_85 as controlling variables.

4. EVALUATION OF KOREA'S FISCAL POLICY RESPONSE IN 2009

In this section, I evaluate Korea's fiscal policy response in 2009 in relation to the empirical analysis discussed above.

4.1 How big was it?

As in most other countries, Korea's fiscal balance deteriorated substantially in 2009 as a consequence of economic slowdown and discretionary policy responses by the government. However, preliminary estimates indicate that Korea's GDP growth rate in 2009 was not as bad as had been thought previously: it was slightly positive at 0.1%-0.2%.. While clearly lower than the country's historical average, the growth figure is higher than most people had initially predicted. In fact, according to my definition, the Korean economy was not even in recession in 2009. Since fiscal balance is normally expected to change systematically with economic activity, one may wonder whether the sizeable government budget deficit in 2009 can be justified by the GDP growth rate.

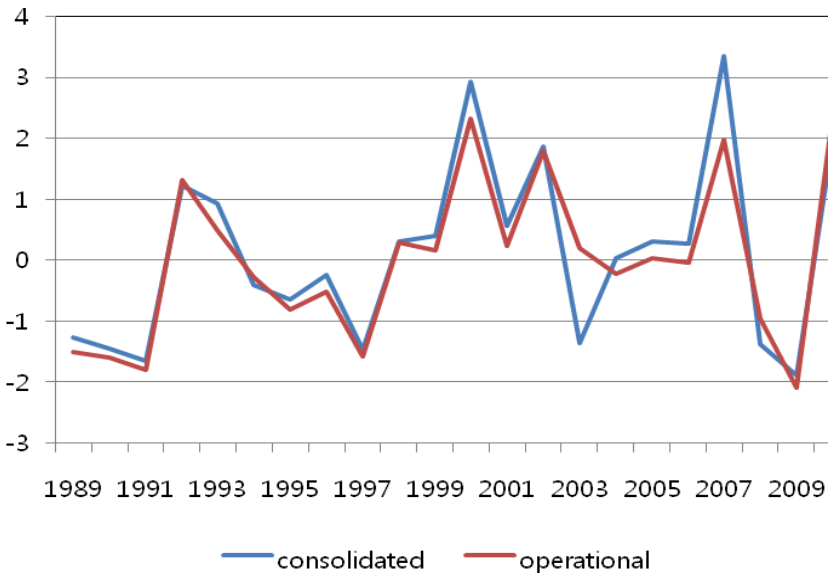
In order to evaluate the magnitude of Korea's fiscal response in 2009, I examine changes in the fiscal balance to GDP ratio after making cyclical adjustments to the series. In particular, I regress changes in the government budget balance to GDP ratio on GDP growth and examine how the residual changed over time.[13] The correlation between the dependent variable (changes in the government budget balance to GDP ratio) and the independent variable (GDP growth) is about 0.53 in Korea for both the consolidated budget and the

[13] Similar results are obtained when we first regress the fiscal balance to GDP ratio on logarithm of GDP (detrended using Hodrick-Prescott filtering) and then take differences of the residual. We have also examined residuals from regressing the fiscal balance/GDP ratio on GDP growth and found that the residual is lower in 2009 than in 1998.

operational budget. Changes in the government budget balance to GDP ratio after cyclical adjustments are shown as a graph in Figure 6. As Figure 6 shows, the adjusted series is at its lowest in 2009, indicating that the sharp turn to government budget deficit in 2009 was more than can be warranted by the GDP growth rate. The expansionary change in 1998, in contrast, turns out to be fully justified by the low GDP growth rate at that time: the cyclically adjusted series is almost exactly zero for 1998. This suggests that Korea's fiscal response in 2009 was unprecedentedly large, especially when the severity of the economic downturn is taken into account.

Figure 6: Korea's Fiscal Response in 2009

cyclically adjusted Δ(fiscal balance/GDP)

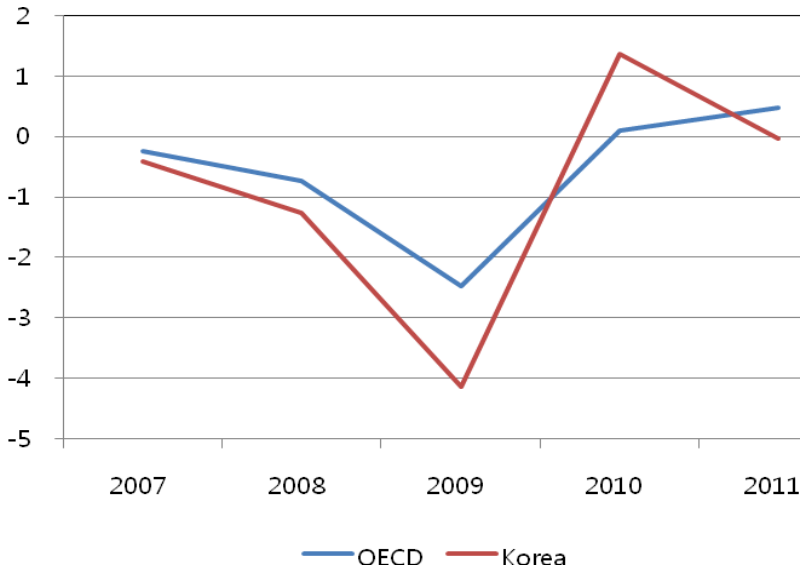


Source: author's calculation

Korea's fiscal response was large by international standards as well. When compared with other OECD economies in 2009, Korea appears to have been more keen to provide fiscal stimulus. The first graph in Figure 7 makes a comparison between OECD and Korea in terms of cyclically-adjusted changes in the government budget balance to GDP ratio, with the cyclical adjustment made in the same way as in Figure 6. To make an international comparison possible, fiscal balance here is defined as total outlays minus total tax and non-tax receipts of the general government as reported in the OECD Economic Outlook. Forecast values for 2010 and 2011 are from the same source. It is clear from the graph that the absolute magnitude of the fiscal response in 2009 was greater in Korea than in other OECD economies on average. A similar pattern is observed in the second graph in Figure 7 where I adjust for country-fixed effects instead of cyclical components in the fiscal response series. After adjusting for country-fixed effects, fiscal measures in Korea in 2009 are shown to be more counter-cyclical than the same measures in other OECD economies.

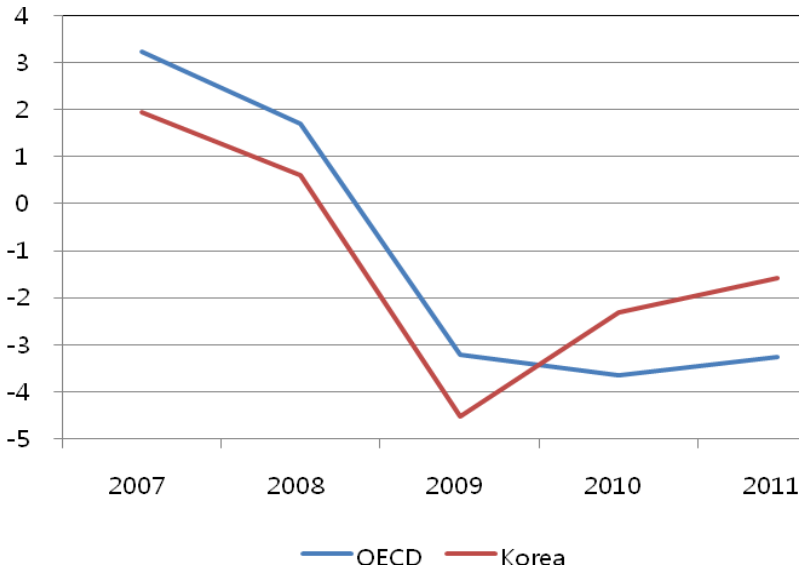
Figure 7: Fiscal Response in 2009: OECD vs. Korea

cyclically adjusted Δ(fiscal balance/GDP)



Source: author's calculation

fixed-effect controlled Δ(fiscal balance/GDP)



Source: author's calculation

The large magnitude of Korea's fiscal response in 2009 can be associated with several reasons. First, as was clearly shown in the 1997-98 Asian crisis, concerns about exchange rate stability can substantially limit the scope for counter-cyclical monetary policy, especially in developing economies. With limited flexibility in monetary policy, fiscal policy should play a greater role in stabilizing the economy. Second, fiscal policy has relatively short outside lags. The long inside lag of fiscal policy can be reduced through the practice of supplementary budgets and front-loading of expenditures. These two measures have been particularly useful in Korea. Since 1990, only in two years, 1993 and 2007, was a supplementary budget not introduced. In 1991, 1998, 1999, 2001, and 2003, two supplementary budgets were introduced in each year. Also, the rate of implementation of fiscal spending was as high as 84% at the end of the third quarter of 2009. With such flexibility in its implementation and excution, a fiscal stimuls would naturally be favored by policy makers. Third, compared with other OECD economies, Korea has relatively small automatic stabilizers. This means that Korea needs to rely more on discretionary measures for stabilization. These explanations, however, do not provide an answer to the question of why fiscal the government budget deficit should be so large in 2009 compared with other years.

Perhaps the most straightforward explanation may be that the Lee administration has a strong inclination for expansionary policies. From the beginning of his term in 2008, President Lee has been trying to implement various tax cut plans and large scale public projects. Apparently, the global financial crisis provided a rationale for his expansionary stance.

4.2 How effective was it?

Another important issue in the evaluation of a fiscal response is the magnitude of the fiscal multiplier. A multiplier greater than 1 means that a fiscal stimulus can be particularly effective in giving a boost to the economy. A multiplier less than 1 means that there is a "crowding-out" effect: an increase in government spending causes other GDP components to decrease. While studies have found a wide range of values for the short-term fiscal multiplier, it is typically less than 1. For example, Barro and Redlick (2009) found that the defense spending multiplier is 0.6-0.7, substantially smaller than 1. OECD Economic Outlook (2009) provides a summary of existing studies in addition to its own estimates of fiscal multipliers. According to the report, the spending multiplier is smaller than 1 for most OECD economies, including Korea with an estimate of 0.8. It is larger than 1 only for large economies such as the US, Japan, and Germany. Existing studies in Korea also inidicate that the fiscal multiplier is positive but less than 1. Hyun (2009), for example, estimates that a 1 unit increase in fiscal expenditure in Korea leads to a 0.4 unit increase in GDP in the same year and a 0.17 unit increase in the next year. Huh (2007) and Kim (2007) each use a structural vector autoregression model and find that the fiscal multiplier is not significantly different from zero or even negative. Moon (2010) reports larger estimates: 0.9 for the expenditure multiplier and 0.6 for the tax multiplier.

It could be argued that the fiscal multiplier is likely to be larger in the current crisis because the effectiveness of a stimulus package depends on the severity of a recession. It is clear that the fiscal multiplier should be zero for an economy operating at full capacity. When there is slack in the economy, however, an increase in government demand would lead to an increase in output. At the same time, however, balance sheet effects and great uncertainty caused by a crisis can make individuals wanting to save more, thus lowering the fiscal multiplier. Thus, it is unclear what the net effect would be for the current crisis.

In Table 3, I provided a result that is closely related to fiscal multipliers. According to Table 3, a 1 percentage point increase in government consumption growth during a recession period leads to a roughly 0.3 percentage point increase in GDP growth during the first year going into the recovery phase. While not directly comparable to previous estimates of multipliers,

the result suggests that the short-term multiplier effect of government spending may be rather substantial.[14] Since government consumption amounts to about 15% of GDP in my sample, a 1 percentage point increase in government consumption growth corresponds to additional government consumption of about 0.15% of GDP. The coefficient of 0.3 in Table 3 thus implies that the short-term multiplier may be as high as 2 (=0.3/0.15). I also examine the medium-term effects of government spending, by extending the analysis in Table 3 and estimating the impact of fiscal policies on the growth rate in later years. I consider up to five years after the trough in my estimation and provide the results in Table 6. The result for the first post-trough year is the same as in column (1) in Table 3. Results for the other years suggest that effects of government spending may be even greater in the medium-term than in the short-term.

It is not clear why my estimate of multiplier effects is so large. One possible explanation is that, in contrast to previous studies that examine all sample years, I only use recession periods in my estimation. As mentioned above, a demand stimulus can be effective only when there are spare resources. My approach may produce a greater estimate of fiscal multiplier because resources are underutilized during recessions. Another possibility is that the composition of fiscal spending may be structurally different between recession or crisis periods and ordinary periods. For example, capital injection by the government into troubled financial institutions can promote recovery through money and credit creation rather than the traditional Keynesian multiplier effect. Government consumption expenditure during a crisis period may serve as a proxy for the overall fiscal stimulus package that includes capital injection and other similar measures.[15]

Table 6: Fiscal Policy and Post-Trough Growth

	1st year	2nd year	3rd year	4th year	5th year
Fiscal policy	0.32** (2.80)	0.63** (4.56)	0.21 (1.28)	0.35** (3.43)	-0.21* (-1.82)
Monetary policy	-0.09 (-0.73)	-0.14 (-0.88)	-0.07 (-0.45)	0.03 (0.23)	0.14 (1.01)
Log(-amplitude)	0.47** (2.01)	0.17 (0.59)	-0.29 (-0.99)	0.07 (0.34)	0.07 (0.29)
# of obs.	73	73	72	72	72

Source: author's calculations

Note: The dependent variable is the GDP growth rate during a year after the trough. Panel estimation with fixed effects. t-ratios are in parentheses. * and ** denote significance at the 10% level and the 5% level, respectively.

4.3 Debt sustainability

While Korea's fiscal response in 2009 may have contributed to an early recovery of the Korean economy, it has also raised concerns about fiscal consolidation. As described in Section II, Korea's government debt to GDP ratio, although still relatively low by international standards, has been increasing very rapidly. In addition, it is widely believed that Korea has an unusually large number of "below-the-line" items that are not included in the official fiscal data. Some even argue that Korea's too narrow coverage of fiscal debt makes international

[14] Our measure of fiscal policy is accumulated changes in government consumption over the recession years, from the peak year to the trough year. Since the duration of a recession can be longer than 1 year, the coefficient on fiscal policy in Table 3 may partly reflect lagged responses in GDP growth to a fiscal spending increase.

[15] As mentioned above, we use consumption expenditure, not total expenditure, of the government because of data availability. Government consumption expenditure does not include transfer payments. Transfer payments may have a smaller multiplier effect than government consumption expenditure, because recipients of transfer payments may not increase their spending by the same amount.

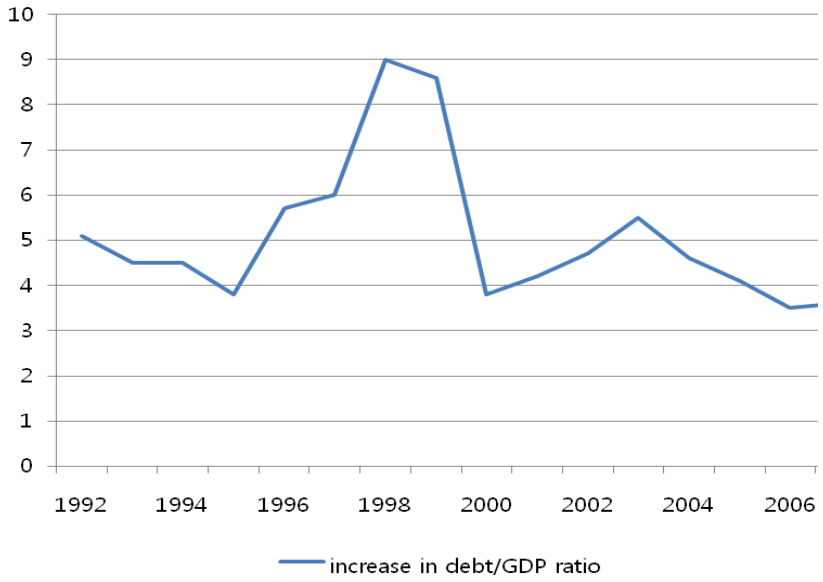
comparison almost meaningless (Ok 2007). When the “below-the-line” items are included, Korea’s fiscal debt may be substantially greater.

In this section, I assess the long-term sustainability of Korea’s fiscal debt by providing a review of existing empirical studies on the issue. Since one of the most distinguishing features of Korea’s government debt has been the rapidly increasing trend, most studies focus on the time series behavior, rather than the level, of fiscal variables. While these studies use various empirical methods including Bohn’s test, non-stationary tests, cointegration tests, etc., most of them conclude that Korea’s government debt position is sustainable. Bohn’s test examines how primary balance changes in response to the government debt to GDP ratio in the previous period. If the primary balance improves whenever the debt to GDP ratio increases, government debt is regarded as sustainable. By applying Bohn’s test to Korean data, Moon (2010) finds that a 1 percentage point increase in the debt to GDP ratio tends to be followed by a 0.1-0.15 percentage point increase in the primary balancce to GDP ratio. The esimated coefficient of 0.1-0.15 is not particularly small compared to estimates from other countries. Based on these results, Moon (2010) argues that Korea’s government debt passes the sustainability test. Some other studies examine whether the debt to GDP ratio is stationary or whether fiscal expenditure and revenue are cointegrated with each other. As long as the debt/GDP ratio does not diverge, one can assume that fiscal debt is not increasing too fast. Similarly, as long as government expenditure does not deviate too much from fiscal revenue, it can be assumed that there is no persistent government budget deficit. Studies that follow these approaches typically find that Korea’s government debt is sustainable.

Park et al. (2006) follow a somewhat different approach and focus on the level, rather than time series movements, of government debt. They first relate international differences in the levels of fiscal debt to various economic, demographic, and political variables. After adjusting for the effect of these factors on the magnitude of government debt, they find that Korea’s debt is smaller than predicted by the model. This result also supports the view that debt sustainability may not yet be a serious problem for Korea. Another way to determine the sustainable level of government debt is to compute the debt level that is consistent with the ability to generate a primary balance surplus and growth adjusted interest rates. According to simple intertemporal budget accounting, fiscal debt as a % of GDP should be less than $p(1+g)/(r-g)$ where p is primary balance as a % of GDP, g the growth rate, and r the interest rate. For example, given $r-g = 4\%$ and $p = 2\%$, the sustainable level of government debt should be less than 50% of GDP. However, it is not clear whether Korea’s government debt satisfies this criterion, because the calculation is quite sensitive to assumptions about the relevant interest rate.

Although existing studies tend to conclude that Korea’s fiscal debt is sustainable, the sizeable deficit and the rapidly increasing trend in the debt to GDP ratio in recent years still calls for vigilance. As is well known, the government budget balance tends to move asymmetrically over a business cycle, with the deficit recorded during a recession not fully offset by the surplus during a boom. Consequently, an increase in government debt is rarely reversed. In Figure 8, I illustrate how government budget deficits translate into government debt over time using data from OECD. Figure 8 shows that, except for the years arount the Asian crisis, a 1 percentage point increase in the deficit to GDP ratio in a particular year was associated with a 4-5 percentage point increase in the debt to GDP ratio in 2007. Government budget deficits made during the Asian crisis period had an even greater impact on the government debt to GDP ratio in 2007. The lack of a trend in the series indicates that an increase in government deficit has an almost permanent effect on the level of government debt.

Figure 8: From Deficit to Debt: OECD



Source: author's calculation

5. POLICY FRAMEWORKS FOR FISCAL CONSOLIDATION

In this section, I suggest possible policy frameworks that may be used for fiscal consolidation. As mentioned above, Korea's government debt increased quickly in the aftermath of the Asian crisis in 1998 and the global crisis in 2009. It is expected to further increase in the coming years as a result of an aging population. Thus, it is crucial to establish policy frameworks that can secure fiscal consolidation in the long run.

First, the Korean government may want to enforce that counter-cyclical discretionary measures shoud have no long-term implications for the government debt to GDP ratio. This is possible only when government budget deficits made during a recession are reversed during an economic boom. In order to achieve this, Korea will have to adopt a stricter practice of medium-term budget planning. Second, Korea may need to expand automatic stabilizers and reduce discretionary components in the government budget. Under an administration with an expansionary bias, large discretionary components in the government budget may be particularly harmful for fiscal consolidation. Also, Korea has relatively small automatic stabilizers compared with other OECD economies. Automated changes in transfer payments, for example, would help expand Korea's limited social safety net. Third, it may help to produce more comprehensive measures of government debt by extending the coverage of offical debt figures. Fourth, further reforms in the national pension system will be needed, especially because Korea has one of the most rapidly ageing populations. Other standard policy responses to population ageing, such as promoting labor force participation of females and elderly people, would also help.

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