Monetary and Fiscal Policy Implications for Korea after the Global Financial Crisis

December 2017  Beom-Gyo Hong  Jonghyeon Oh
Monetary and Fiscal Policy
Implications for Korea after the
Global Financial Crisis

December 2017

Beom-Gyo Hong and Jonghyeon Oh
I. Introduction .................................................................................................................................................. 9

II. Monetary and Fiscal Policies of Major Countries in Response to the Global Financial Crisis ................................................................................................................................. 12

  1. United States ........................................................................................................................................ 12
     A. Interest rate cuts and quantitative easing ......................................................................................... 12
     B. Fiscal policy ....................................................................................................................................... 14
  2. Europe ................................................................................................................................................... 16
     A. Interest rate cuts and credit expansion .............................................................................................. 16
     B. The spread of negative interest rate policies .................................................................................. 20
  3. Japan ..................................................................................................................................................... 21
     A. Interest rate cuts and quantitative easing .......................................................................................... 21
     B. Expansionary fiscal policy ................................................................................................................. 23
     C. Growth strategy ................................................................................................................................. 24
     D. A negative interest rate policy .......................................................................................................... 24
  4. Policy Effects ....................................................................................................................................... 27

III. Macroeconomic Policy Issues and Its Limitations ............................................................................. 28

  1. Policy Issues after the Financial Crisis - IMF Conference ................................................................. 28
  2. The Era of Chaos Policywise ................................................................................................................ 30
     A. Monetary policy: Liquidity trap and negative interest rates ............................................................... 30
     B. Fiscal policy: Expansion vs. consolidation ....................................................................................... 34
     C. Macroprudential policy: Too big to fail ............................................................................................ 35
     D. Problems of Politics: European Integration and the Eurozone ......................................................... 39
**Monetary and Fiscal Policy Implications for Korea after the Global Financial Crisis**

**Contents**

IV. An Analysis of National Debt and Economic Growth ........................................ 42  
   1. Theoretical Studies .............................................................................................. 42  
   2. Empirical Studies ................................................................................................ 43  
      A. Threshold Effect and Nonlinearity: Studies on Negative Impacts .......... 43  
      B. Studies that Show No Correlation ................................................................. 45  
   3. Empirical Analysis .............................................................................................. 46  
      A. Data and Methodology ............................................................................... 47  
      B. Correlation between Economic Growth Rate and the National Debt Ratio ... 51  
   4. Implications ........................................................................................................ 64  

V. Implications for Korea’s Macroeconomic Policy ..................................................... 65  
   1. Lessons from the Perspective of Economics ....................................................... 65  
   2. Implications from the Perspective of Policy ....................................................... 68  
      A. Macroprudential Policy ............................................................................... 68  
      B. Monetary Policy .......................................................................................... 70  
      C. Fiscal Policy .................................................................................................. 72  
      D. Curbing Financial Excess ............................................................................ 73  
      E. Politics and Economy .................................................................................... 74  

VI. Conclusion ............................................................................................................ 76  

Bibliography ................................................................................................................ 80
List of Tables

<Table II-1> Quantitative Easing Policy of Abenomics ................................................... 22
<Table II-2> Bank of Japan’s Negative Interest Rate Policy ............................................... 25
<Table III-1> Policy Issues after the Global Financial Crisis ............................................. 29
<Table IV-1> Economic Growth Rate and National Debt Ratio of the Countries Analyzed ................................................................. 48
<Table IV-2> Major Control Variables ............................................................................. 50
<Table IV-3> Correlation between Economic Growth Rate and the National Debt Ratio (All Countries) .................................................................................. 53
<Table IV-4> Correlation between Economic Growth Rate and the National Debt Ratio (Developed Countries) ................................................................. 57
<Table IV-5> Correlation between Economic Growth Rate and the National Debt Ratio (Small Open Economy) ................................................................. 60
List of Figures

[Figure II-1] Interest Rate Spread in Government Bond Rate of Eurozone Member Countries (10 year maturity) ......................................................... 17

[Figure II-2] Japanese Tax Revenue Trends by Tax Item ........................................... 23

[Figure II-3] Yen/dollar Exchange Rate Movement Before and After the Negative Interest Rate Policy Announcement ........................................... 26

[Figure II-4] Nikkei 225 Movement Before and After the Negative Interest Rate Policy Announcement ............................................................... 26

[Figure II-5] Economic Growth Rate of Major Countries ........................................... 27

[Figure III-1] Trend of Dividend Yields of Banks and Public Corporations ................. 38

[Figure III-2] Trends of Return on Equity of Banks and Public Corporations ............. 38

[Figure IV-1] Correlation between Economic Growth Rate and the National Debt Ratio (All 35 Countries) ................................................................. 51

[Figure IV-2] Correlation between Economic Growth Rate and the National Debt Ratio (33 Countries except Korea and China) ..................... 52

[Figure IV-3] Correlation between Economic Growth Rate and the National Debt Ratio (18 Developed Countries) ......................................................... 55

[Figure IV-4] Correlation between Economic Growth Rate and the National Debt Ratio (16 Developed Countries except Japan and Greece) .................. 56

[Figure IV-5] Correlation between Economic Growth Rate and the National Debt Ratio (15 Open Economy Countries) ............................................... 58

[Figure IV-6] Correlation between Economic Growth Rate and the National Debt Ratio (13 Small Open Economy Countries except Korea and Greece) .............. 59

[Figure IV-7] Threshold Effect of the National Debt Ratio (18 Developed Countries) .... 62

[Figure IV-8] Correlation between Economic Growth Rate and the National Debt Ratio (18 Developed Countries except Japan and Greece) .................. 63

[Figure IV-9] Threshold Effect of the National Debt Ratio (Japan and Greece) .......... 63
Introduction

This is a time of chaos. As uncertainties in the global economy have increased in recent years, policies based on existing economic theories have failed to show desired effects, and policy authorities in each country have become quite perplexed.

When the East Asian Financial Crisis broke out in 1997, the prescription for those countries by international organizations such as the IMF was a tight-money policy. Until then, such a policy, which followed a traditional prescription, eventually led the countries to overcome the crisis. At the very least, East Asian countries got over the crisis with a tight-money policy based on economic theory. However, in the recent global economic situation, various crisis factors have sprung up all at once, and policies based on past macroeconomic theory have not been effective.

In response to the global financial crisis triggered by the U.S. subprime mortgage crisis in 2007, the United States and Europe adopted a non-traditional liquidity supply policy of quantitative easing. When the economy showed a sign of recovery due to the quantitative easing policy in addition to ultra-low interest rates, the U.S. took measures to raise interest rates in December 2015, nine years after 2006 when the Fed increased the federal fund rate for the last time. However the economies of Europe and Japan did not show signs of recovery. And when the economy showed even signs of deflation, they adopted a negative interest rate policy too. Denmark, Sweden, Switzerland and the European Central Bank introduced negative interest rates and Japan and the Hungarian Central Bank also followed suit. However, this policy did not lead to a rise in inflation
and economic recovery. In contrast to the economic theories, the currencies of these countries rather appreciated.

Moreover, advanced countries such as the U.S. and Japan and EU member countries showed limitations in pursuing an expansionary fiscal policy because of high level of national debts. That is, the policy instruments of advanced countries have already been exhausted. How long can they maintain an expansionary policy stance, and how and when will they be able to reduce hugely expanded monetary base? How big will be the side effects of quantitative easing if they miss the right timing to withdraw money from circulation? All of these are policy questions that they face. Various answers have been offered for these questions, but the answers are often contradictory to each other. As internationally renowned scholars and policy makers express different views and clearly conflicting opinions, it is rather confusing and some clarifications are needed.

The Korean economy has maintained a relatively good condition despite the turmoil in the world economy since the outbreak of the financial crisis. But it is difficult to be overly optimistic about future prospects because as a small open economy Korea is not immune to the overseas shocks. Therefore, it is very important for Korean government to find effective domestic policy measures that help navigate this uncertain times. This report focuses on the policy measures that are emerging after the financial crisis, their limitations and implications, especially in the situation where existing traditional policy instruments have not had the expected effects.

To this end, we examine the policy responses to the financial crisis of 2007 and effects on major countries in Chapter 2. In Chapter 3, we discuss the policy issues raised by the mobilization of nontraditional policy instruments in response to the financial crisis. This report analyzes the contradictory arguments about the effects of monetary policy, fiscal policy, and macroprudential policy. In the face of the gap between existing economic theory and current policy effects, policy alternatives suggested internationally are examined. In Chapter 4, we present some results of an empirical analysis of the relationship between the national debt and economic growth. That is one of the major fiscal policy topics we at the Korea Institute of Public Finance are interested in. In Chapter 5, based on the discussion in Chapter 3 and analysis
in Chapter 4, we look at policy agenda and implications of current international discussions on macroeconomic policy for Korea. Chapter 6 concludes the discussions.
Monetary and Fiscal Policies of Major Countries in Response to the Global Financial Crisis

1 United States

A. Interest rate cuts and quantitative easing

In response to the financial crisis, the U.S. continued to maintain interest rates of zero to 0.25% after December 2008, cutting the policy rate nine times after cutting it from 5% in early 2007 to 4.75% in September of the same year. Then the U.S. raised interest rates to 0.25-0.5% in December 2015 for the first time in nine years, as the recovery of the U.S. economy seemed solid. The U.S. was expected to continue to raise interest rates thereafter, but in June 2016, the result of the UK’s Brexit referendum and international uncertainties put off further increases and thereby additional increases have been withheld.

In the early years of the financial crisis, as the liquidity supply and policy rate cuts continued, unrest in the financial market led the U.S. to implement three quantitative easing programs as a means of non-traditional monetary policy. The first quantitative easing policy (QE1) started with a $600 billion asset purchase plan in November 2008, and in March 2009, the U.S. decided to buy $1.75 trillion of bonds. As the U.S. began to show signs of economic recovery due to the first quantitative easing, discussions on an exit strategy for the quantitative easing policy began.

However, the quantitative easing policy did not end easily because it
was difficult to determine that the economy was alive again, despite discussions on an exit strategy. In June 2009, the Federal Open Market Committee (FOMC) said it would maintain its quantitative easing policy but monitor its asset size and adjust its liquidity supply plan accordingly. The Fed Chairman Ben Bernanke said that he would repurchase assets within the limit of the funds recovered in accordance with the maturity of assets such as government bonds and MBS held in August 2010. Bernanke said in an annual Central Bank meeting that the Fed may purchase additional assets so that the market could be stabilized.

In November 2010, the second quantitative easing policy (QE2) began when the FOMC decided to purchase $600 billion in long-term government bonds for eight months until June 2011, and to continue reinvesting the money collected at the maturity of the assets held by the Fed.

However, as the economic recovery was still slow after the second quantitative easing, the Fed tried to cut the long-term interest rate in “Operation Twist,” which replaced short-term government bonds with long-term government bonds. Initially, it sold $400 billion in short-term government bonds with a maturity of less than three years and intended to buy long-term government bonds with a maturity of six to 30 years. Its termination date was set to be the end of June 2012. However, as the operation did not hit the desired target, the Fed increased the short-term government bond sale by $267 billion and extended the termination to the end of December 2012.

The third quantitative easing policy (QE3) began in September 2012 with the announcement that the U.S. Federal Reserve Board (FRB) would continue to purchase $40 billion of MBS each month until the employment situation improved sufficiently. The Fed decided to keep the zero interest rate until mid-2015, and in December of that year it would purchase an additional $45 billion per month of non-MBS long-term government bonds. As economic indicators, such as the employment situation, improved in the U.S., the Fed announced tapering (QE tapering) in December 2013 and that it would gradually reduce the size of bond purchases. The FOMC decided to reduce the amount of its $85 billion per month asset purchases to $75 billion from January of
the next year. Subsequently, in January 2014, the Fed announced that it would reduce the size of quantitative easing to $10 billion. As a result, the amount of asset purchases were reduced to $30 billion of MBS and $35 billion of government bonds from February of the same year. In October 2014, the Fed ended quantitative easing, announcing that it would finally stop buying the assets, which started in September 2012.

**B. Fiscal policy**

Along with the quantitative easing policy, the U.S. had implemented various economic stimulus measures. In February 2008, a stimulus bill, which was prepared for stimulating the economy, was passed. The loan limit for mortgages, etc. was increased and tax refund and reduction programs were implemented. Fannie Mae, Freddie Mac, and others increased mortgage amounts to be purchased and the Federal Housing Association (FHA)’s upper limit amount of housing financing guarantees also rose to $729,750. Taxpayers with an annual income of more than US$3,000 were reimbursed ranging from US$ 300 to US$600 for individuals and US$600 to US$1,200 for married families, with an additional US$300 per child. New investments by small companies were allowed to be deducted as cost and the special depreciation limit was also increased for the amounts newly invested by enterprises. In July 2008, the U.S. tried to revitalize the housing market by enacting the Housing and Economic Recovery Act. It gave tax credits for self-owned and rental housing, exempted tax on housing-related bonds and provided tax support for disaster-hit area housing.

In September 2008, the U.S. Department of the Treasury implemented the $700 billion Troubled Asset Relief Program (TARP), separately from the Fed. The purpose of the program was largely divided into raising capital for insolvent banks, restructuring of the automobile industry, activation of the structured bond market, purchasing of bad assets, and protection of homeowners.

---

3) Sung & Kim(2009), p.42.
Although a large portion of the TARP funds was used to replenish the capital of large financial institutions, igniting the controversy of “too big to fail,” the implementation of TARP greatly contributed to the normalization of the financial system because the financial market's uneasiness rapidly lessened.

In February 2009, the American Recovery and Reinvestment Act was enacted to provide an additional stimulus of $782.2 billion. Of this, US$575.4 billion was spent for job creation, local government support and infrastructure maintenance. This fiscal stabilization fund was used for social overhead capital, energy, education, and so on to create jobs. They are also used to expand unemployment benefits and the government subsidy. The remaining $211.8 billion was used as a tax expenditure for the low-income family support program and the earned income tax credit program. It is also used to support companies with various tax credits.

In addition, the pay-as-you-go system was reintroduced for fiscal consolidation in 2010. Any new legislation that requires either an increase of mandatory expenditure or a reduction of tax revenue should be submitted with a corresponding funding plan at the same time. It was introduced in the U.S. in 1990 and maintained until 2002.

4) About two-thirds of the total funds were used to raise capital for big financial institutions such as AIG ($69.8 billion) and Bank of America, Citi, JPMorgan, Wells Fargo ($25 billion each).
5) op. cit., pp.6~7.
2 Europe

A. Interest rate cuts and credit expansion

After the collapse of Lehman Brothers in September 2008, the global financial crisis that began in the United States caused the greatest economic downturn in the European economy since World War II through financial and capital markets. At the time, European banks, which were investing heavily in the mortgage bonds of the U.S. in direct and indirect ways, suffered huge losses and became dependent on government bailouts. Nonperforming loans also increased sharply owing to the excessive debt of the private sector caused by the rapid collapse of the real estate market bubble. Due to the depreciation of currencies in emerging economies and the shortage of foreign exchange reserves, exports of major European countries also plummeted leading to negative growth for seven consecutive quarters starting from the second quarter of 2008. In 2009, the economy contracted by -4.2% and Europe came to experience the largest economic depression since World War II.

During the period from August 2007, when the subprime mortgage crisis broke out, to September 2008 when Lehman Brothers went broke, the main goal of the European Central Bank (ECB) was to meet the liquidity needs of the banking sector, which temporarily increased during the financial instability. There were signs of a financial crisis even at the beginning of 2008, but not expecting Lehman Brothers' bankruptcy, the ECB raised the benchmark interest rate from 4.0% to 4.25% in July of the same year.

However, as Lehman Brothers bankruptcy deepened the global financial crisis and stagnated the global financial markets, the ECB cut its benchmark interest rate to 1% by cutting 3.25% from October 2008 to May 2009. In addition, as in the United States, various non-traditional monetary policy instruments were used with the judgment that the crisis response was insufficient with interest rate cuts alone.

From 2009, the financial market began to gradually stabilized by various ECB policy measures. The money market spreads gradually decreased, the stock and bond markets showed signs of revival, and the bank borrowing rate dropped with the market interest rate.

However, as the fiscal deterioration and uncertain sustainability of some countries in the euro area became apparent in early 2010, the fiscal crisis began to take place. Starting from the end of 2011, the crisis spread to various countries in Europe.7) [Figure II-1] reflects the financial situation of southern European countries such as Greece, Portugal, Italy, and Spain, as well as Ireland's government bond rates compared to Germany's government bond rates. In the end, the bailout of Greece (January - May 2010) followed by the bailouts of Ireland and Portugal (November 2010 - April 2011) was granted. The government bond rates in Italy and Spain (July - December 2011) surged and the recession spread again.

![Figure II-1] Interest Rate Spread in Government Bond Rate of Eurozone Member Countries (10 year maturity)

Source: Kang(2014), p.82

---

With the emergence of the European fiscal crisis, the ECB launched the Securities Markets Program (SMP) and restarted its non-traditional monetary policy, which was halted by the stabilization of the financial market.\(^8\) In addition to the SMP, the ECB also announced a Long-Term Refinancing Operation and an Outright Monetary Transaction program.\(^9\)

The SMP began in May 2010 with the aim of providing depth and liquidity to the paralyzed government bond market. It is normal for the ECB to supply short and long-term funds with government bonds as collateral. But a direct purchase of government bonds by the ECB was the first instance since the ECB was launched. It purchased a total of €60 billion worth of government bonds in May 2010. After the bailout of Greece, the frequency and scale of the bailout was reduced and temporarily stopped in the first half of 2011. However, it was reintroduced after July 2011, when the interest rates of Italian and Spanish government bonds surged. The ECB bought €120 billion worth of government bonds from August to November 2011. As of February 17, 2012, the total amount of ECB-owned eurozone bonds reached €219.3 billion.

As the government bond rates of Italy and Spain, which had fallen temporarily due to the SMP measures, soared again and the financial markets were affected by concerns about fiscal troubles in various European countries, the ECB carried out a massive LTRO in December 2011 and February 2012.\(^10\) It supplied €489 billion through LTRO in December 2011. A total of 523 eurozone financial institutions applied for a three-year, 1% interest rate LTRO, and Italy and Spain banks borrowed €110 billion and €80 billion, respectively. In February 2012, a total of €529.5 billion was executed in the second LTRO for 800 commercial banks. The ECB also raised euro liquidity by lowering the reserve ratio for commercial banks from 2% to 1%.

Although the eurozone government bond and equity markets recovered rapidly due to the LTRO, the eurozone announced Outright Monetary Transactions (OMT) in September 2012 because the eurozone became

---

\(^8\) ECB(2010), pp.72~73.
\(^10\) ibid., pp.55~60.
Monetary and Fiscal Policies of Major Countries in Response to the Global Financial Crisis

19
economically depressed again owing to the fiscal crisis and tightening of several countries.\(^{11}\) OMT mainly made unrestricted purchases of treasury bonds in crisis countries in the eurozone. According to the ECB's announcement, OMT, like the SMP, aimed to restore the transmission channel of monetary policy and maintain the uniformity of the eurozone government bond market.\(^{12}\) The difference between OMT and SMP was that OMT restricted the purchase of target government bonds to government bonds with 1- to 3-year maturity of the bailed-out countries. OMT also allowed unlimited purchases without time limits and imposed severe bailout conditions. OMT was similar to the quantitative easing (QE) of the U.S., but sterilization measures were used in contrast to the QE. Also by confining the government bonds to be purchased to those with remaining maturity of one to three years, it reduced the possibility of monetization of government debts.

As the euro area's economic recession and deflationary fears grew, the ECB gradually introduced additional measures in sequence, such as asset purchase programs and negative interest rate policy, aiming at a 2% inflation rate. Starting from June 11, 2014, the ECB decided to apply a negative interest rate (-0.1\%) to the deposit facility and the average balance of reserves that exceeded the minimum reserve requirement.\(^{13}\) In October 2014, the ECB resumed the Asset-Backed Securities Purchase Program and the Covered-Bond Purchase Program for the next two years.\(^{14}\) In March 2015, the ECB extended the existing asset purchase program (APP) to include additional bonds issued by the eurozone central banks and related institutions and decided to purchase up to €60 billion in assets per month by September 2016.\(^{15}\) In March 2016,

\(^{11}\) ibid., pp.60~64.
the Corporate Sector Purchase Program was introduced in which the purchase of a non-financial corporate bonds was the target in addition to the existing APP from the second quarter of 2016 and it raised the amount of asset purchase to €80 billion per month.16)

B. The spread of negative interest rate policies

Countries outside the eurozone, including Denmark, Sweden and Switzerland, were concerned about the upward pressure of their currencies and deflation due to the depreciation of the euro following the ECB’s quantitative easing policy.17) These neighboring countries have close economic relationships with the euro area. But because they do not use the euro, they are small open economies where the values of their currency are greatly influenced by the change in the value of euro. Denmark is maintaining a fixed exchange rate to euro and Sweden is a Nordic economic power. And the Swiss franc is considered to be a safe asset. Because of these reasons, they experienced a rise in the value of their currencies due to sudden inflows of foreign exchanges. In response to this capital inflow, each of these countries introduced a negative interest rate policy in succession: Denmark in July 2012, Sweden in July 2014 and Switzerland in December 2014.18) In particular, Sweden and Switzerland were responding to the ECB’s introduction of negative interest rates starting in June 2014. In March 2016, Hungary also introduced negative interest rates to stimulate its economy.

We had better pay attention to Sweden because its real estate market was overheated, the ratio of household debt to disposable income was one of the highest in the world at 180%, and its economy depended on exports. Korea’s economic structure is very similar to Sweden. In Sweden, GDP growth was 3.4% in the second quarter of 2016, which was a relatively high growth rate.

Sweden's high growth rate was considered to be the result of increased consumption and government spending by taking in refugees at Europe's highest level in comparison with its population.\(^ {19} \) Despite the high growth rate and overheated real estate market, Sweden introduced a negative interest rate policy in 2014 in order to devalue the krona in response to the introduction of the ECB's negative interest rates, as the Swedish economy depended on exports. Although the value of the krona has declined recently, it had remained strong for a while after the negative rate policy. In addition, since the inflation rate remained at around 1% in September 2016, the Swedish central bank announced that it would stick to the negative interest rate policy for the time being.\(^ {20} \)

### 3 Japan

The Abe administration, which was launched in December 2012, aimed to break from deflation which predominated in the “lost two decades” before the financial crisis. The government launched “Abenomics,” which promoted monetary policy, fiscal policy and growth strategies as three economic revival programs.

#### A. Interest rate cuts and quantitative easing

Japan's consumer price increase rate has never exceeded 2% since it recorded 3.3% in 1991. Since 1991, there has been a negative growth rate of price increase for a considerable period of time. Except for 1.76% in 1997, when the Asian financial crisis broke out and 1.38% in 2008, when the financial crisis broke out, the Consumer Price Index (CPI) showed a steady decline for most of the period. In 2014, when the consumption tax rate was raised, the CPI was 2.75%, surpassing 2%, but it turned negative again in 2016.

Japan’s easy monetary easing policy, known as the first arrow of the

---

19) It was reported that Sweden accepted about 160,000 refugees in 2015. (Financial Times, “Sweden’s growth surge raises fears over negative rates policy,” March 1, 2016)

Abenomics, aimed at achieving a 2% inflation rate by the end of 2014. To this end, Japan implemented a quantitative easing policy to increase the amount of reserve money from 138 trillion yen in 2012 to 200 trillion yen in 2013 and 270 trillion yen in 2014 and to increase the balance by purchasing long-term government bonds worth 50 trillion yen annually. (See <Table II-1>)

In addition, after the outbreak of the global financial crisis, the yen continued to appreciate until 2012, when the Abe administration began. Then the yen began to depreciate due to expansionary monetary policy of the Abe administration, but again appreciate from 2015. The depreciation of the yen since the start of the Abe administration has been at the fastest rate in the history of the yen exchange rate. However, since the recent introduction of a negative interest rate policy in Japan, the yen has appreciated again. This is an unpredictable phenomenon that is contrary to policy prescription, as worldwide demand for the yen as a safe asset has increased in a globally low interest rate environment.

<table>
<thead>
<tr>
<th>(Table II-1) Quantitative Easing Policy of Abenomics</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>First quantitative easing</strong>&lt;br&gt; (April, 2013)</td>
</tr>
<tr>
<td><strong>Expansion of reserve money</strong></td>
</tr>
<tr>
<td>- 138 trillion yen at the end of 2012 → 200 trillion yen at the end of 2013 → 270 trillion yen at the end of 2014</td>
</tr>
<tr>
<td><strong>Expansion of long-term government bond purchase</strong></td>
</tr>
<tr>
<td>- 4 trillion yen → 7 trillion yen each month</td>
</tr>
<tr>
<td>- Long-term government bond reserves of BOJ: 89 trillion yen at the end of 2012 → 190 trillion yen at the end of 2014</td>
</tr>
<tr>
<td>- The average remaining maturity of BOJ holding government bonds: About 3 years → 7 years</td>
</tr>
<tr>
<td><strong>Expansion of listed assets purchase</strong></td>
</tr>
<tr>
<td>- BOJ’s ETF reserve: 1.5 trillion yen at the end of 2012 → 3.5 trillion yen at the end of 2014</td>
</tr>
<tr>
<td>- BOJ’s J-REIT purchase: 10 billion yen → 30 billion yen annually, 110 billion yen at the end of 2012 → 170 billion yen at the end of 2014</td>
</tr>
<tr>
<td>- JPX Nikkei 400 ETFs was included as new purchase target assets</td>
</tr>
</tbody>
</table>

Source: BOJ (https://www.boj.or.jp/mopo/outline/qqe.htm/#p02). Search date: July 12, 2016. The author made the table after collecting the relevant data.
B. Expansionary fiscal policy

The second arrow of Abenomics focused on financing public work projects to stimulate economic recovery. In order to revitalize the Japanese economy, the Abe administration announced emergency economic measures in January 2013. At the same time, the government decided to increase the budget deficit to 11.5% of GDP in 2013 by adding a supplementary budget of 10.3 trillion yen. Because about 5.2 trillion yen out of the 10.3 trillion yen of the supplementary budget had been allocated to public work projects in 2013, the total budget for public work projects exceeded 20 trillion yen in 2013. The Abe administration raised the consumption tax from 5% to 8% in April 2014 and planned to achieve fiscal consolidation with increased tax revenue.

[Figure II-2] Japanese Tax Revenue Trends by Tax Item

C. Growth strategy

Despite of the quantitative easing and fiscal spending implemented by the Abe administration, the Japanese government made a judgment that they were not enough to revitalize the economy. Thus they announced a growth strategy in June 2014 that was called the third arrow of Abenomics. This was a measure to help private companies and individuals achieve maximum performance by deregulation, etc. It aimed to achieve nominal GDP growth rate of 3%, real GDP growth rate of 2%, and increase of GNI per capita of 1.5 million yen by the end of 2020.

First of all, the Abe administration pointed out high corporate tax rates, delayed trade liberalization, labor regulations, and excessive yen appreciation as factors that hindered Japan's economic revival and reduced potential growth rates. Therefore, to strengthen the competitiveness of Japanese companies and attract foreign companies, the Abe administration has gradually lowered the effective corporate tax rate to the 20% level and expanded investment and employment to prevent recession. In addition, the Abe administration sought to reconstruct the economy by mitigating various industry regulations so that the work forces such as young people, women and the elderly could be fully utilized. The effective corporate tax rate, which was 52% in 1998, was 35.64% in 2014, but it is still the highest among the seven major advanced economies (G7).

D. A negative interest rate policy

Japan announced that it would introduce a negative interest rate policy in February 2016, based on the belief that the current quantitative easing policy alone would not achieve the inflation target of 2%. Japan introduced the negative interest rate to enhance export competitiveness and increase consumption and investment by reducing the risk of deflation and depreciation of the yen.
The negative interest rates introduced by the Bank of Japan consisted of three different rates depending on different balances, as shown in <Table II-2>. Negative rate of -0.1% would apply to the policy rate balance. Since Japan only recently implemented the negative interest rate policy, there is still insufficient data to verify its effects. At the time of the announcement of the negative interest rate policy, the value of the yen seemed to decline. But soon after, the foreign exchange market and the stock market responded contrary to the anticipation of the economic stimulus showing the value of the yen increasing. (See [Figure II-3] and [Figure II-4])
Monetary and Fiscal Policy Implications for Korea after the Global Financial Crisis

[Figure II-3] Yen/dollar Exchange Rate Movement Before and After the Negative Interest Rate Policy Announcement


[Figure II-4] Nikkei 225 Movement Before and After the Negative Interest Rate Policy Announcement

Such policies of major countries as quantitative easing, negative interest rate policy intended to bring economic recovery ultimately. But the specific goals were to achieve a 2% inflation rate and increase employment.

GDP growth in the U.S. dropped to -2.78% in 2009 due to the financial crisis in 2008, but recovered to 2.53% in 2010 due to economic stimulus measures such as interest rate cuts and quantitative easing policies. Recently, it has been fluctuating at the 2% level.

The European Union’s GDP growth had been around 2~3% before 2008, but fell sharply after 2008 to -4.39% in 2009. Although it succeeded in rebounding, it fell into a double dip of negative growth again in 2012. It seems to be recovering recently.

In the case of Japan, the bottom of the growth rate due to the financial crisis was the deepest, and it recovered sharply in 2010. But the Great East Japan Earthquake in 2011 put the growth rate in the negative again and then it has rebounded. However Japan is showing the weakest growth among major countries (see [Figure II-5]).
Macroeconomic Policy Issues and Its Limitations

This chapter focuses on the macroeconomic policies implemented after the global financial crisis and the policy debate about the effects of these policies. The first section examines the macroeconomic issues raised after the financial crisis, mainly from the IMF conferences. In Section 2, we select and examine main argument in the international debates since the onset of the financial crisis.

1 Policy Issues after the Financial Crisis - IMF Conference

A crisis occurs when an event is not foreseen beforehand, or though it was predictable but cannot be prevented. If we were able to avoid one by precisely predicting any event in advance and prevented it happening, it would not be called a crisis afterwards. Since the 1980s, a period called the Great Moderation, the overconfidence\(^\text{21}\) of policy authorities and academics about economic fluctuations has been one of the reasons for the unpreparedness for of the financial crisis.\(^\text{22}\)

\(^{21}\) Robert Lucas of the University of Chicago, a winner of the Nobel Prize in Economics, declared in 2003 that concerns about economic fluctuations were over in his inaugural address to be the president of the American Economic Association. The IMF was also convinced in 2006 that financial innovation reduced the likelihood of bankruptcy of commercial banks by increasing the resilience of the financial system (Turner (2016), p.242).

\(^{22}\) When the Queen of England visited LSE in 2008 after the outbreak of the global financial crisis, she asked why economists failed to anticipate the financial crisis. Turner (2016) explained it with basic assumptions and the model building process, Turner’s next sentence expresses it in a compressed way:'
Out of a sense of urgency in the early part of the financial crisis and the subsequent fiscal crisis in Europe, the policy authorities in developed countries mobilized all available policy measures. However, opinions are divided on their effect. Academics and policy authorities in self-reflection have been actively discussing future direction of macroeconomics in terms of theory and policy in light of the unpredictability of the financial crisis.23)24)

<table>
<thead>
<tr>
<th>Policy</th>
<th>Issue</th>
</tr>
</thead>
</table>
| Monetary policy | ① Should the central bank target output rather than inflation?  
② Should the central bank target financial stability?  
③ Should the central bank be involved in the exchange rate?  
④ How should the central bank deal with the lower limit of zero in interest rates?  
⑤ Whom should the central bank provide liquidity to? |
| Fiscal policy | ① What is the risk of high national debt?  
② How should the risk of fiscal dominance be handled?  
③ How quickly should the national debt be reduced?  
④ Can the automatic stabilization device be made more efficient? |
| Macroprudential policy | ① How should we combine macroeconomic policy and microprudential regulation?  
② What macroprudential policy instruments do we have, and how do they work?  
③ How should monetary and macroprudential policies be combined? |

"You cannot see a crisis coming if you have theories and models that assume that the crisis is impossible" (p.246). Of course, some scholars like Rajan(2005) and Roubini(2006) warned of the possibility of a financial crisis, but they were not noticed at the time.

23) Romer(2012), for example, also mentions the DSGE model, which is the latest trend in macroeconomic models, as follows: “The workforce new Keynesian dynamic stochastic general equilibrium (DSGE) models on which we were concentrating so much of our attention have been of minimal value in addressing the greatest macroeconomic crisis in three-quarters of a century” (p.57).

24) Blanchard(2014) points out that the current macro model fails to adequately capture the financial sector (p.322).
Blanchard et al. (2014) summarizes the issues of monetary policy, fiscal policy and macroeconomic policy after the financial crisis as shown in <Table III-1>.25)

The Era of Chaos Policywise

As for the policy issues raised by the financial crisis, some have been dealt with for a long time. But there are many problems that have arisen because traditional policy measures were no longer effective. As a result, questions about the theoretical basis for these traditional policy instruments were raised, and the policy authorities were facing difficulties in choosing appropriate policies. International discussions on issues raised to tackle these difficulties are actively underway, but it seems that more time is still needed to establish at least a coherent view or to draw up policies that most people agree on.

These issues are also closely related to each other. For example, the negative interest rate that is monetary policy issue is linked to the issue of macroprudential policy at the same time. Because negative interest rate can lead to insolvency of financial institutions by affecting their profitability. It is also related to the issue of independence of central banks, considering whether the enforcement of policies should be made by one authority or two authorities. From this point of view, it is not easy to draw conclusions about each issue even if it is not a special situation such as a financial crisis.

This report examines different theoretical and political views between academics and policymakers and tries to find their implications on the issues of monetary policy, fiscal policy and macroprudential policy.

A. Monetary policy: Liquidity trap and negative interest rates

1) Determination of policy rate

The U.S. Fed's monetary policy is a prototype of global central bank
monetary policy. From the 1970s until the early 1980s, when Paul Volcker was the chairman of the Federal Reserve Board, controlling money supply was the direct means of achieving monetary policy goals. However, since the mid-1980s, the federal fund rate has been targeted as a direct monetary policy tool. Since then it is a typical monetary policy mechanism to achieve policy goals by raising or lowering the policy rate responding to the business cycle. The policy objective here is a pre-set inflation rate. And since the relationship between inflation and output gap was stable, the Fed has we have been responding to economic fluctuations by hitting the target inflation rate.

Ben Bernanke, the chairman of the Federal Reserve Board, along with Treasury Secretary Hank Paulson, Timothy Geithner, the president of the Federal Reserve Bank of New York, and FDIC Chairman Sheila Bair was responsible for coping with the global financial crisis. Overall macroeconomic policy was the responsibility of the Secretary of the Treasury, but the U.S. monetary authority was the FRB. Since the U.S. interest rates were already low through the period of Great Moderation, there was not much room for a rate cut following the financial crisis. Thus, Bernanke adopted massive quantitative easing in which the central bank supplied money by directly purchasing government bonds. According to existing monetary theory, quantitative easing on this scale would result in inflation. However, in spite of the large-scale money supply, the global economy was worrying about deflation.

According to Bernanke (2015), in the course of the Fed's continued policy rate cuts following the outbreak of the financial crisis, Thomas Hoenig, the president of the Kansas City Federal Reserve Bank (1991-2011), consistently voted against rate cuts. Since the Great Moderation era, he thought that, low interest rates had persisted for too long, thus raising the possibility of a sharp rate hike as economic condition changes. He also thought that interest rates did not need to be lowered because the reason investments were not made was due to neither high interest rate nor low liquidity but economic uncertainty.

Bernanke, on the other hand, carried out quantitative easing, a non-traditional policy means because he thought that the economy could not recover

with interest rate cuts alone. On the other hand, the Fed hawks represented by Hoenig opposed interest rate cuts, showing a typical confrontation in the monetary policy decision-making process. The fact that such contradictory opinions emerged during a crisis is an example of how crucial an individual member’s judgment is. It is even doubtful whether there is a rationale on which policy decisions are based.\(^{27}\)

In the 20 years when Alan Greenspan was the chairman of the Fed (1987-2006), the Fed was more confident about economic fluctuations by sustaining economic boom through low interest rates. However, after the financial crisis in 2008, the interpretation that the bubble was caused by easy money policy for an extended period of time has dominated. Thus it is not difficult to assume that concerns over diverse easy money policies that carried out in much larger scale than the Great Moderation era resulted in objections to cut interest rates.

It was Keynes who emphasized effective demand in the 1930s when his economic theory for overcoming the Great Depression was presented. At the time of the stock market crash in 1929, President Hoover raised various taxes to increase government revenue in order to restore budget balances. And he strengthened protectionism by signing the Smoot-Hawley Tariff Act. As a result, the economy shrank further and to make it worse the Fed raised interest rates.\(^{28}\) In 1932, President Roosevelt, who won over Hoover, implemented various stimulus measures to increase effective demand based on Keynes’ theory. However, it was probable that the decisive factor for overcoming the Great Depression was the outbreak of World War II. It was the Fed doves’ logic that policy authorities, who encountered a global financial crisis comparable to the Great Depression in the 1930s, should mobilize all available demand promoting

\(^{27}\) Given that central bank interest rate adjustments generally follow Taylor’s rule of adjusting nominal interest rates at a certain rate in line with inflation gaps and output gaps, it is more so.

\(^{28}\) Friedman and Schwartz (1963) have shown that the Fed unnecessarily raised interest rates and shrugged off economic activity with three examples: January to June 1920, October 1931, and July 1936 to January 1937. In October 1931, the start of the Great Depression, the Fed raised the rediscount rate from 1.5% to 3.5%, resulting in a sharp decline in money supply and a 24% decline in industrial production (pp.688~689). The majority opinions that the timing of an interest rate increase should not be hurried seem to be the influence of Friedman and Schwartz.
means to avoid repeating the policy failures of the past.

2) Liquidity trap and negative interest rate policy

Some countries adopted a negative interest rate policy after quantitative easing. For the rate cut policy was no longer useful for boosting the economy because of liquidity trap with extremely low interest rates. The negative interest rate policy was aimed to stimulate the economy by expanding exports and increasing consumption with the expansion of loans. However, in reality, the negative interest rate policy rather increased savings due to increased anxiety about the future.29)

Despite the uncertain effects of the negative interest rate policy, the policy authorities are maintaining it for two reasons. One is a psychological factor. It is intended to convey to the market the willingness of the government to maintain an environment for stimulation through quantitative easing and the negative interest rate. Second, as Friedman and Schwartz (1963) pointed out, with the experience of the Great Depression, the policy authorities are extremely cautious about the possibility of hindering economic recovery by prematurely raising interest rates. Summers pointed out that since the end of World War II, the FRB had never predicted a recession well at all and argued that it should not be hasty to raise interest rates unless there were clear signs of a recovery.30)

Most economists, such as Yellen (2014) and Woodford (2014), agree that interest rates should not be raised hurriedly, given the uncertainty surrounding the economic recovery. Considering the relationship between interest rate hikes and the economy, the error of a delayed increase of interest rates is much safer in terms of policies than the error of a premature increase of interest rates. On the other hand, those who advocate an early increase believe that a delayed increase has a greater risk of excessive inflation and a sharp rate hike later.

The effects of a negative interest rate policy depend on the economic

---

29) Some homeowners in Denmark (for example, the Horseshoe apartments in Copenhagen) were experiencing a strange phenomenon of receiving monthly interest instead of paying interest on mortgages. (Financial Times, "One size does not fit all with negative rates," Sep. 6 2016)

30) 2016 Homer Jones Memorial Lecture, "Secular Stagnation and Monetary Policy," YouTube, Search date: August 5, 2016,
situation in each country, but four factors seem to be important: the way banks raise funds, the reliance on private pensions, the value of the country’s currency and the use of cash substitutes.\textsuperscript{31)} In particular, it is viewed that the effects of a negative interest rate policy can be enhanced by eliminating the use of cash, because the constraints of the lower limit of interest rates are eliminated.

There have been many studies on a “cashless society” recently. Rogoff (2014) suggested to eliminate cash to reduce underground economy. Also, in the current low interest rate era, he saw that the limits of monetary policy could be overcome by eliminating cash. However, since there were many inconveniences in disposing of all currencies at once, it was suggested to remove large denomination bills first and use small denomination bills and coins as they were. Kim (2016) said that if cash was not used, social costs could be reduced by as much as the cost of cash use, and effective macroeconomic policies could be established in the low-growth, low-price, low-interest era.

However, Min (2016) presented a view of the economy without cash from a new perspective of state power and freedom\textsuperscript{32)}. We can understand the side effects that an economy with no cash will bring in terms of individual freedom, but he thinks that measures to get rid of large denomination bills will gain broader support.

B. Fiscal policy: Expansion vs. consolidation

Issues on the fiscal policy were not new ones but traditional ones. Once the crisis subsided to a certain extent, the policy authorities had to choose between stimulative fiscal measures and fiscal soundness. It was possible to rely on deficit financing to get out of recession in the short term. Japan maintained its expansionary fiscal policy even though its national debt exceeded 200% of GDP.\textsuperscript{33)} The U.S. also overcame the financial crisis by using all policy measures

\textsuperscript{31)} Financial Times, “One size does not fit all with negative rates,” Sep. 6, 2016


\textsuperscript{33)} In spite of Japan’s excessive national debt, it is believed that, the expansion of fiscal policy is possible because most debts are held by Japanese nationals.
including quantitative easing as well as an expansionary fiscal policy. However, since deficit financing cannot be maintained indefinitely, discussions on the proper timing and speed of transition from expansionary fiscal policy to tight one are underway.

This issue can be considered in connection with the proposition of Reinhart and Rogoff (2009). They reviewed the data of 66 countries over 800 years and stressed the importance of fiscal soundness by showing that if national debt exceededs. 90% of GDP, economic growth was negatively affected. One lesson they could draw from the centuries-old crises of many nations was that the accumulation of excessive debt was the source of all crises. It was pointed out that even if debt did not seem to be a problem in a boom period, excessive debt was always the common cause of repetitive crises for governments, banks, enterprises and individuals. The results of Reinhart and Rogoff also influenced policy-makers. The Chancellor of the Exchequer George Osborne in the cabinet of David Cameron directly quoted the results of the study and made fiscal austerity a key policy. When it comes to crisis, is it important to use all the bullets? Or should we endure some degree of suffering, considering the latter days? If so, how much? This problem can also be attributed to the tax burden between current and future generations. These are the propositions that have been handled innumerable times in public finance, but they still require answers after the global financial crisis.

C. Macroprudential policy: Too big to fail

1) Too big to fail

When a financial crisis comes, we inevitably find solutions in restructuring. Usually big financial institutions survive and smaller ones do not. This issue of “too big to fail” caused the confrontation between Timothy Geithner
and Sheila Bair in the course of the financial crisis. Despite the fact that they were the same members of the top policy-making group during the global financial crisis, they confronted each other due to their views on system stability vs. moral hazard.\(^{36}\)

Geithner argued that even though the financial institutions in question triggered the crisis, it was important to try to stabilize the system considering system risk. He emphasized the importance of securing sufficient public funds to support troubled financial institutions.\(^{37}\) On the other hand, in order to achieve the stable operation of the deposit insurance fund and prevent moral hazard, Bair maintained to withdraw public funds from the financial institutions in question rather than inject public funds into them. However, as the insolvency of large financial institutions such as the Citi Group and AIG was gradually revealed, Treasury Secretary Hank Paulson and Fed Chairman Ben Bernanke agreed with Geithner and implemented the bailout, while strengthening the supervision of financial institutions.\(^{38}\) As a result, the myth of the immortality of large financial institutions continues.

“Too big to fail” had been a problem before the financial crisis and it resurfaced as a big issue for policy makers in the financial crisis. Bair (2012) argued that the problem of immortality of big institutions should be prevented in advance by dividing up large financial institutions. She suggested restrictions on the size of financial institutions, the restoration of the Glass-Steagall Act for the strict restrictions on business, and the prohibition of brokerages or market making by commercial banks while allowing them to run the business of

---

36) “Geithner (2014) wrote an autobiography called Stress Test, which reflected the process of overcoming the financial crisis and Bair (2012) wrote an autobiography of a similar character, Bull by the Horns. In particular, Bair talks frankly about the conflicts with Geithner in the policy-making process during the financial crisis.

37) “It has to be big if you want it to be decisive,” Geithner (2014), p.193. At that time, Treasury Secretary Paulson (2013) made a funny analogy when asking Congress to give full power to prevent Fannie Mae and Freddie Mac from bankruptcy, “If you’ve got a squirt gun in your pocket, you may have to take it out. If you’ve got a bazooka, and people know you’ve got it, you may not have to take it out,” (p.xvii).

38) The Dodd–Frank Act, which was enacted in 2010, is a representative Act to strengthen the supervision of financial institutions. It included the introduction of systemically important financial institutions’ expansion of capital and a stress test system that predicts the possibility of bankruptcy by banks in various crisis scenarios and takes reinforcement measures.
investment banking. Johnson and Kwak (2010) also argued that Congress needed to break up large financial institutions and make them smaller.

Neel Kashkari, President of the Federal Reserve Bank of Minneapolis proposed another measure to solve “too big to fail” problem. He suggested to make big financial institutions (SIFIs) into public corporations. As public corporations, big banks have to expand their capital considerably, and the supervision on big banks have to be strengthened to the level of nuclear power plant so that they would not be able to go bankrupt. Paulson (2013) suggested to have a system where the bigger the size, the less the benefit of the size of the financial institution by strengthening the regulations on capital and liquidity.

[Figure III-2] and [Figure III-3] show the dividend yield and return on equity of banks and public corporations, respectively. We can see recent trends tend to approach each other. In terms of regulatory level, stock value, profitability, and dividends, the indicators of banks and public corporations show that Kashkari’s argument might be reasonable. Bair (2014) answered to the IMF’s question of whether it would be able to solve this problem by saying that it should be solved and even suggested that large banks should be nationalized if the problem could not be solved.

39) See Bair (2012), pp.328~331
40) ibid, p.327
42) Romer(2014) has the same opinion on the dramatic expansion of the equity capital of financial institutions.
[Figure III-1] Trend of Dividend Yields of Banks and Public Corporations


[Figure III-2] Trends of Return on Equity of Banks and Public Corporations

2) Capital Control

The use of capital control as a macroeconomic policy tool is another important issue. Raghuram Rajan, a professor at the University of Chicago who served as the governor of the Bank of India, criticized the central banks of developed countries for their orientation toward short-term stimulation of the economy. He emphasized that it was important for central banks in developed countries to start raising interest rates to help the global economy recover. It might hinder the immediate recovery of the domestic economy. But his logic was that developed countries would ultimately benefit if emerging economies recovered by allowing them to gradually adjust themselves through gradual global rate hikes. If developed countries suddenly raise interest rates after they are delayed, this can lead to rapid capital movements, which can lead to crises in emerging countries. Rey (2014) pointed out that the empirical evidence for the advantages of free capital movement was unexpectedly weak. Fischer raised fundamental questions about the need for short-term capital movement. In 1997, during the Asian financial crisis, Malaysia actually used capital control as a means of overcoming the foreign exchange crisis, and during the recent financial crisis Iceland was the first country that used capital control.

D. Problems of Politics: European Integration and the Eurozone

Since policy is a product of politics, pure economic policies that is not affected by politics are hard to imagine. In the case of Europe, there is a union and a common currency zone whose members are different. At the same time, the EU recognizes the sovereignty of member countries. Therefore, while the ECB is responsible for monetary policy within the eurozone, fiscal policy is being implemented by each member country. It is also a problem that a
A common monetary policy should be applied though the national economic situations are different. There also is a difficulty in harmonizing different national fiscal policies. It seems that political conflicts are triggered by seeking common policies in different member countries. These political factors may explain why the recovery of Europe is slower than the U.S.

Mario Draghi is the president of the ECB (2011 ~) and was the head of the Italian central bank. And Wolfgang Schäuble is the finance minister of Germany (2009 ~), which can be called the "largest shareholder" of the EU. In the process of fixing the European debt crisis, Draghi declared an unlimited quantitative easing policy and Schäuble opposed it. Germany experienced hyperinflation in the process of making compensation for its responsibility in World War I. This experience is deeply embedded in German people and the German Bundesbank fears about inflation than any other central bank in the world. In addition, despite the fact that Germany has the most favorable national debt ratios among the major European countries, Germany is also opposed to excessive fiscal expansion. The German prime minister is politically responsible to the German people through elections, not to other countries within the European Union. Therefore, the inconsistency of policy effects due to differences in economic situations of different member countries is an inevitable weakness of such a system.

An example of political conflicts arising from differences in the economic power of the eurozone countries could be found in the Greek debt crisis. The troika's conditions for providing bailout funds to Greece was to tighten public finance and restructuring, that was similar to those conditions imposed on the countries in the 1997 Asian foreign exchange crisis. However, as shown in the example of the Allied debt relief for Germany which was burdened with war reparations following the two World Wars, it is not generally feasible for a distressed country to repay huge amounts of loans. Former Greek Treasury

---

48) In fact, Jens Weidmann, a member of the Executive Board of the ECB and Bundesbank president, voted against the quantitative easing decision in the Executive Board of the ECB, But here, in the confrontation between Germany and the EU, we quoted Schäuble as Germany’s representative economic leader.

49) See Varoufakis(2016)

50) This refers to the EU, ECB and IMF, which played a leading role in financing Greek bailout.
Minister Varoufakis (2016), who was in charge of the negotiations, argued that the bailout fund would ultimately be used to make large European banks sound, which would only increase the debt on the part of the Greek people.

Europe has recently been struggling with the financial crisis and mass inflow of refugees from the Middle East. The EU has the political apparatus in the form of the Commission, the Parliament and the Court of Justice of the EU, but member states still have political sovereignty. Therefore the future course of Europe will be determined depending on how the EU system, which has prioritized monetary integration in advance of actual political integration, overcome the financial crisis and the refugee crisis.52)

51) Reinhart and Rogoff (2009) showed that a number of national defaults have occurred since the nation-state was established. France has committed eight bankruptcies against overseas debt and Spain has had six bankruptcies before 1800 and seven bankruptcies thereafter.

52) After the death of Carolus Magnus, the heyday of the medieval Frankish kingdom, the kingdom was divided into Germany, France and Italy. Europeans are looking for the origin of European integration in the Frankish kingdom of Carolus Magnus, who placed it in a European Empire through one culture and one religion. The birth of the European Monetary System in 1978, the Maastricht Treaty in 1992, and the introduction of the euro in 1999 can be seen as the process of moving toward the United States of Europe.
An Analysis of National Debt and Economic Growth

In this chapter, we try to draw some implications from an empirical analysis of the fiscal policy issue. In particular, we examine previous studies on the relationship between national debt and economic growth rate and try to make in-depth analysis based on data from 35 countries.

1 Theoretical Studies

Elmendorf and Mankiw (1999) presented traditional views on the impact of deficit public financing on economic growth. According to them, an increase in national debt can have a positive impact on the economy in the short term, but negative in the long run. In the short term, it is positive because the increase in the national debt induces higher aggregate demand through the increase of disposable household income. However, in the long term, the increase in national debt reduces the capital of the economy due to the decrease in domestic and foreign investment. This increases the marginal productivity of capital and raises the interest rate, while the marginal productivity of labor declines and wages fall. Thus household income decreases. The drop in foreign capital means that the income earned by domestic people from foreign capital is reduced. The decline in foreign investment is linked to a decline in the trade balance. In

53) Refer to Panizza and Presbitero (2013) for a more detailed summary of previous studies on the relationship between national debt ratios and economic growth rates.
other words, deficit public financing through national bonds has a negative impact on economic growth in the long run.

Unlike the traditional view, Delong and Summers (2012) argued that when interest rate was very low during a severe economic slump, if the government used an expansionary fiscal policy through bond issuance, it would positively affect the economy in the short term as well as in the long run. This is because, if a severe economic recession persists, the potential growth rate of GDP will also decrease if not met by an expansionary fiscal policy. Because short-term stimulus through national debt issuance can prevent or mitigate it. Furthermore, they argued that the increased potential GDP though short-term stimulus did not necessarily impose financial burden due to the functioning of self-financing of government bond issuance.

A fundamental difference between the traditional view and the argument of Delong and Summers (2012) is whether an expansionary fiscal policy affects potential GDP. Ramey (2012) questioned the arguments of Delong and Summers (2012). Expanding government spending during a long downturn period neither create jobs that can make workers keep up their skills nor increase investment. In particular Ramey (2012) presented an empirical analysis that showed increases in government spending drove out investment rather than increased it.

### 2 Empirical Studies

A. Threshold Effect and Nonlinearity: Studies on Negative Impacts

Reinhart and Rogoff (2009) showed that, in developed countries, if the national debt ratio exceeded 90%, economic growth rate was significantly lower than that of other countries. In the case of emerging countries, they suggested that, if the national debt ratio exceeded 60%, economic growth started to decline. The results of Reinhart and Rogoff (2009) were criticized by Herndon, Ash, and Pollin (2014) for data selection, coding errors, and inaccurate weights. But their study triggered a good deal of following studies on the existence of threshold effects that implied the rate of economic growth slowed down significantly if the national debt ratio exceeded a certain threshold.
Kumar and Woo (2010) analyzed the relationship between national debt ratios and economic growth in 38 developed or emerging countries. They suggested that if the national debt ratio increased by 10%p, the GDP per capita growth rate for the next five years declined by 0.2%p. In countries with a national debt ratio less than 90%, there was no significant correlation between the national debt ratio and economic growth. However, in countries with a national debt ratio over 90%, they found a nonlinearity that hindered economic growth. However, Panizza and Presbitero (2013) pointed out that the results of Kumar and Woo (2010) on nonlinearity were not robust in estimation methods.

Cecchetti, Mohanty, and Zampolli (2011) analyzed 18 countries in the OECD and drew conclusions similar to Kumar and Woo (2010). In their model without considering the threshold effect, if the national debt ratio increased by 10%p, the per capita GDP fell by 0.18%p. And when the threshold effect was considered, the national debt ratio significantly inhibited economic growth only when it was higher than the threshold. The result implied the nonlinearity existed. The difference with Kumar and Woo (2010) is that Cecchetti, Mohanty, and Zampolli (2011) estimated national debt ratios that correspond to thresholds, not arbitrarily picking a certain level of national debt ratio as the threshold. And they suggested the ratio of 84% or 96% depending on the control variables.

Checherita-Westphal and Rother (2012) showed that there was an inverted-U relationship between national debt ratios and economic growth in an analysis of the 12 eurozone countries. In particular, if the national debt ratio exceeded 90~100%, economic growth rate was negatively affected. This reverse-U relationship was also found between the national debt ratio and private savings, government investment and total factor productivity. Checherita-Westphal and Rother (2012) pointed out that the above three factors were the main routes by which national debt ratio influenced economic growth.

Baum, Checherita-Westphal and Rother (2013) also made an analysis of 12 countries in the eurozone. Unlike previous studies, their study had two thresholds. If the national debt ratio was lower than 67%, the two variables had a positive relationship, but in the 67% to 95% range, the relationship disappeared. And the national debt ratio had a negative effect on economic growth when it was above 95%, as in the previous studies.

Two thresholds are also found in Afonso and Jalles (2013). They analyzed
the results for 155 countries and found that the effect was positive if the national debt ratio was less than 30% and negative if it was more than 90%. On the other hand, Afonso and Jalles (2013) endogenously estimated the national debt ratio corresponding to the threshold, which turned out to be about 59%.

Afonso and Alves (2014) analyzed the impact of national debt ratio on economic growth in 14 European countries. They found that if the national debt ratio increased by 10%p, the economic growth rate was reduced by 0.1%p and the national debt ratio corresponding to the threshold was 75%.

In Korea, Moon (2013) analyzed the existence of a threshold effect in the analysis of 34 OECD countries. However, the national debt ratio corresponding to the threshold was estimated to be 43% which showed big difference with previous overseas studies whose thresholds were in the range of 85%~95%. Kim (2014), in an analysis of 20 OECD countries, showed that nonlinearity existed between the national debt ratio and economic growth. In contrast to the previous studies, he added the square of national debt ratio as a regressor and found its coefficient was significantly negative. That shows a reverse U-shape relationship between the two variables.

B. Studies that Show No Correlation

Unlike the empirical studies mentioned above, there are also studies that find no clear evidences for the negative relationship between the national debt ratio and economic growth rate. Panizza and Presbitero (2014) said that there were no evidences for the negative relationship by controlling endogeneity. Reinhart and Rogoff (2010) and other studies on the existence of threshold effects provided evidences for the relationship between national debt and economic growth, but not for the causality. Panizza and Presbitero (2014) showed that if we focused on the causality by controlling endogeneity, national debt did not have a significant impact on economic growth.

Pescatori, Sandri, and Simon (2014) also reported no evidence of a threshold effect when mitigating the problem of endogeneity. Instead, they suggested that the trend of the national debt ratio had a significant impact on economic growth. Even if the national debt ratio was high, it would have a positive impact on economic growth if it was declining.
When they analyzed data from developed countries, such as OECD countries, Pescatori, Sandri, and Simon (2014) had difficulties finding evidence that national debt affected economic growth. However, they pointed out that the inclusion of more nations might result in different outcomes. In particular, Kourtellos, Stengos, and Tan (2013) included developing countries and found that the effects of national debt on economic growth might vary according to the degree of democracy in each country. In developed countries with mature democracy, national debt did not have a significant impact on economic growth, but in countries with incipient democracy, high levels of national debt impeded economic growth.

Egert (2015a, 2015b) pointed out that the estimation results of the nonlinearity of the relationship between national debt and economic growth were very sensitive to the scope of data and the method of analysis. Also they found a threshold effect in rare cases where the threshold national debt ratio was 20–60%. Those numbers were significantly lower than the 90% suggested by Reinhart and Rogoff (2009).

Eberhardt and Presbitero (2013) suggested that countries with higher national debt ratios tended to have lower economic growth rates. But the effect of national debt on economic growth varied among countries. In addition, a certain level of threshold common to all countries could not be found. It might vary from country to country or time to time.

Eberhardt (2016) analyzed the correlation between national debt ratios and economic growth rates over the past two centuries for the United Kingdom, Japan, Sweden and the United States. They found there were some correlations between the two variables in some periods. But the results showed that there was no clear evidence for the threshold effect as a whole.

3 Empirical Analysis

This study empirically analyzed the impact of the national debt ratio on economic growth. To this end, we first examined the simple correlation between the national debt ratio and economic growth rate without controlling other variables. This correlation analysis has the advantage that it is easy to
grasp the approximate relationship between the two variables. But there is a problem that a wrong conclusion can be reached because it is an analysis that does not control other variables that affect the economic growth rate. Therefore, we also conduct an empirical analysis controlling other variables that may affect the economic growth rate.

A. Data and Methodology

The empirical analysis is based on data from the 35 countries listed in Table IV-1. We selected countries for which we could construct data set of control variables from the countries included in Cecchetti, Mohanty, and Zampolli (2011) and Kumar and Woo (2010).54) They are divided into two groups. The first group is 18 developed countries which were selected by Cecchetti, Mohanty, and Zampolli (2011), for of the comparability of the results. In particular, the robustness of the results of Cecchetti, Mohanty, and Zampolli (2011) can be examined by analyzing the data published by them in the same way while expanding the data by increasing the number of countries and time span. The second group is small open economies like Korea. For small open economies, two criteria were used: population size and openness. The population of these countries is between 10 million and 100 million, on average, over five years from 2010 to 2014. Open countries mean that their sum of imports and exports accounts for more than 50% of GDP. The countries that meet these criteria are 15 countries including Korea, Australia, Belgium and Canada.

The analysis period for most countries is 35 years, from 1980 to 2014. However, data on the economic growth rate was constructed with a five-year overlap panel as in Cecchetti, Mohanty, and Zampolli (2011), thus information

54) Cecchetti et al. (2011) analyzed 18 developed countries and Kumar and Woo (2010) analyzed 38 developed and emerging countries. A total of 40 countries were included in Cecchetti et al. (2011) or Kumar and Woo (2010). From them we excluded Hong Kong, Peru, Pakistan, Czech Republic and Slovakia.
<table>
<thead>
<tr>
<th>Country</th>
<th>ADV</th>
<th>SOE</th>
<th>Number of observation</th>
<th>Economic Growth Rate</th>
<th>National Debt Ratio</th>
</tr>
</thead>
<tbody>
<tr>
<td>Australia</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.018</td>
<td>0.201</td>
</tr>
<tr>
<td>Austria</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.018</td>
<td>0.586</td>
</tr>
<tr>
<td>Belgium</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.016</td>
<td>1.127</td>
</tr>
<tr>
<td>Brazil</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.013</td>
<td>0.601</td>
</tr>
<tr>
<td>Canada</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.014</td>
<td>0.758</td>
</tr>
<tr>
<td>Chile</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.035</td>
<td>0.424</td>
</tr>
<tr>
<td>China</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.063</td>
<td>0.164</td>
</tr>
<tr>
<td>Columbia</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.019</td>
<td>0.321</td>
</tr>
<tr>
<td>Denmark</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.014</td>
<td>0.536</td>
</tr>
<tr>
<td>Egypt</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.030</td>
<td>0.984</td>
</tr>
<tr>
<td>Finland</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.018</td>
<td>0.328</td>
</tr>
<tr>
<td>France</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.013</td>
<td>0.481</td>
</tr>
<tr>
<td>Germany</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.017</td>
<td>0.511</td>
</tr>
<tr>
<td>Greece</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.008</td>
<td>0.803</td>
</tr>
<tr>
<td>Hungry</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.013</td>
<td>0.806</td>
</tr>
<tr>
<td>India</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.035</td>
<td>0.418</td>
</tr>
<tr>
<td>Indonesia</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.043</td>
<td>0.644</td>
</tr>
<tr>
<td>Italy</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.011</td>
<td>0.954</td>
</tr>
<tr>
<td>Japan</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.017</td>
<td>1.115</td>
</tr>
<tr>
<td>Korea</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.056</td>
<td>0.179</td>
</tr>
<tr>
<td>Malaysia</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.033</td>
<td>0.557</td>
</tr>
<tr>
<td>Mexico</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.007</td>
<td>0.474</td>
</tr>
<tr>
<td>Netherlands</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.017</td>
<td>0.614</td>
</tr>
<tr>
<td>Norway</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.019</td>
<td>0.377</td>
</tr>
<tr>
<td>Philippine</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.011</td>
<td>0.554</td>
</tr>
<tr>
<td>Poland</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.027</td>
<td>0.509</td>
</tr>
<tr>
<td>Portugal</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.018</td>
<td>0.545</td>
</tr>
<tr>
<td>Russia</td>
<td>•</td>
<td></td>
<td>20</td>
<td>0.018</td>
<td>0.463</td>
</tr>
<tr>
<td>South Africa</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.004</td>
<td>0.352</td>
</tr>
<tr>
<td>Spain</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.018</td>
<td>0.458</td>
</tr>
<tr>
<td>Sweden</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.017</td>
<td>0.574</td>
</tr>
<tr>
<td>Switzerland</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.010</td>
<td>0.460</td>
</tr>
<tr>
<td>Turkey</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.026</td>
<td>0.419</td>
</tr>
<tr>
<td>UK</td>
<td>•</td>
<td>•</td>
<td>30</td>
<td>0.019</td>
<td>0.534</td>
</tr>
<tr>
<td>USA</td>
<td>•</td>
<td></td>
<td>30</td>
<td>0.018</td>
<td>0.404</td>
</tr>
</tbody>
</table>

Notes: 1. ADV means developed country
2. SOE means small open economy

Source: 1. Economic growth rate: The authors calculated it using each country’s real GDP and population in Penn World Table 9.0
in the last five years is lost. The fact that the economic growth rate data was constructed as a five-year overlapping panel means that economic growth variables are derived as in the following formula (IV-3) under the assumption that the economic situation, such as the current national debt ratio, affects economic growth over the next five years.

\[
\bar{g}_{t,t+5} \text{ refers to the average economic growth rate for the next five years and } y_t \text{ represents per capita real GDP.}
\]

\[
\bar{g}_{t,t+5} = \frac{1}{5} \left[ \log(y_{t+5}) - \log(y_t) \right] \text{ .................................................. (IV-3)}
\]

A fixed effect panel analysis model of (IV-4) that can take into account the unobserved unique characteristics of each country was used. \( d_{i,t} \) in the formula below is the national debt ratio, and \( y_{i,t} \) is per capita real GDP, and \( X_{i,t} \) is other control variables that can affect the economic growth rate. \( \mu_i \) is characteristic variable by country and \( \lambda_t \) is the dummy variable for each year.

\[
\bar{g}_{t,t+5} = \beta d_{i,t} + \gamma \log(y_{i,t}) + \delta' X_{i,t} + \mu_i + \lambda_t + \epsilon_{i,t,t+5} \text{ ................. (IV-4)}
\]

Other variables that may affect economic growth are the ones in <Table IV-2>. These are commonly used variables for the study of economic growth and national debt as in Cecchetti, Mohanty, and Zampolli (2011). Some countries’ data have missing years, so this study uses unbalanced panel data.

For the period of the financial crisis, it refers to the financial crisis period within the next five years for which the average economic growth rate, a dependent variable, was calculated according to the method of Cecchetti, Mohanty, and Zampolli (2011). For example, in Reinhart's data, the Asian Financial Crisis period from 1997 to 2002 was treated as a financial crisis period. In this case, Korea's financial crisis variable in 2000 has a value of 2, because only 2001 and 2002 were included in the financial crisis period of 2001 to 2005 during the next five years. If Reinhart's country-specific financial crisis data is included as a control variable, the analysis period will be shortened to
2005. Regression analysis was repeated twice, one considering the financial crisis period and the other not.

The ratio of the dependent population among the control variables in <Table IV-2> may be closely related to the national debt, which may distort the analytic results. The higher the ratio of the dependent population is, the greater the demand for welfare spending is. And the likelihood that the government will finance it through bond issuance when the government cannot finance it through tax revenues increases. But the correlation between the two variables, 0.0259, is not large. However, the analysis is repeated twice for the test of sensitivity, one with the ratio of the dependent population included in the control variables and the other without.

<table>
<thead>
<tr>
<th>(Table IV-2) Major Control Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Variables</td>
</tr>
<tr>
<td>--------------------------------------</td>
</tr>
<tr>
<td>Total saving/GDP</td>
</tr>
<tr>
<td>Average education period</td>
</tr>
<tr>
<td>Inflation rate</td>
</tr>
<tr>
<td>Openness</td>
</tr>
<tr>
<td>Population increase rate</td>
</tr>
<tr>
<td>Current liabilities / GDP</td>
</tr>
<tr>
<td>Percentage of dependent population</td>
</tr>
<tr>
<td>Financial crisis period</td>
</tr>
</tbody>
</table>

Notes: 1. Other variables except for the financial crisis period have data until 2014. But only the information until 2009 is used due to the loss of information for the last five years because of the method of calculating the economic growth rate.
2. Financial crisis period variables are up to 2005, using the information up to 2010

Sources: 1. PWT: Penn World Table 9.0
2. WDI: World Development Indicator, World Bank
B. Correlation between Economic Growth Rate and the National Debt Ratio

First, we examine the correlation between economic growth rate and the national debt ratio without considering other variables. This gives a rough idea of the relationship between the two variables and is particularly useful in discerning countries that have a significant relationship. [Figure IV-1] shows the dispersion of the two variables and the linear regression equation without controlling other variables that can affect economic growth of all 35 countries. We can see a significant negative correlation between the national debt ratio and economic growth rate. In particular, if the national debt ratio increases by 10%p, economic growth rate is reduced by 0.08%p. Since 2011, Korea's average economic growth rate has been about 2.96%, which means a growth rate of 3% cannot be assured. On the other hand, Korea's national debt ratio was 38% in 2015, which is lower than other countries. However, if the national debt ratio increases by 100%p to 138% due to an increase in welfare spending, Korea's

![Figure IV-1](image-url)
economic growth rate will decrease by about 0.8%p. This can be interpreted that even the 2% range economic growth rate may be difficult to be reached.

In the above correlation analysis, the results can be different depending on the scope of countries analyzed. As shown in [Figure IV-1], Korea and China had a very high economic growth rate in the past and their public finances also appeared to be fairly sound. If the high economic growth rates of both countries are due to low national debt ratio, they should be included in the analysis. However the rapid growth of both countries may be due to the rapid accumulation of production capital as well as low national debt ratios. In other words, though the national debt ratio of Korea and China remained low as shown above, if the growth rate of production capital was not so fast, then the economic growth rate might not have been as high as above. Korea and China would have located otherwise, thus the relationship between the national debt ratio and economic growth rate would be weakened in [Figure IV-1]. A simple correlation analysis of the above two variables without controlling other variables can lead to wrong conclusions.

[Figure IV-2] Correlation between Economic Growth Rate and the National Debt Ratio (33 Countries except Korea and China)

\[(\text{Growth Rate}) = 0.018 + 0.001 \times (\text{Debt-to-GDP Ratio})\]

Note: The standard deviation of the slope estimate is 0.0021, which is not statistically significant at the 10% level.
Therefore, we conducted the same analysis for 33 countries, leaving out Korea and China. As shown in [Figure IV-2], the significant correlation between the national debt ratio and economic growth rate disappeared. Depending on the scope of countries analyzed, the impact of the national debt ratio on economic growth rate turn out to be different.

<Table IV-3> presents the results of regression analysis controlling other variables that may affect economic growth. Regression analysis for all 35 countries did not reveal any significant correlation between the national debt ratio and economic growth rate. When we did not take into account other control variables for all 35 countries, it appeared that there was a negative correlation between the national debt ratio and economic growth rate. But if the effects of the control variables are removed, the effects due to national debt ratio disappear. As in the previous analysis, the correlation coefficient for the national debt ratio is not statistically significant when Korea and China are excluded. In short, the analysis of all countries with control variables show that the national debt does not have a statistically significant effect on the economic growth rate.

<table>
<thead>
<tr>
<th>Table IV-3</th>
<th>Correlation between Economic Growth Rate and the National Debt Ratio [All Countries]</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>35 countries</td>
</tr>
<tr>
<td></td>
<td>Model (All-1)</td>
</tr>
<tr>
<td>National debt ratio</td>
<td>0.0047 (0.0079)</td>
</tr>
<tr>
<td>Real GDP per capita</td>
<td>-0.0569*** (0.0177)</td>
</tr>
<tr>
<td>Total savings/GDP</td>
<td>0.0900*** (0.0342)</td>
</tr>
<tr>
<td>Average education period</td>
<td>0.0036 (0.0043)</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>-0.0007 (0.0009)</td>
</tr>
<tr>
<td>Openness</td>
<td>-0.0082 (0.0067)</td>
</tr>
</tbody>
</table>
An analysis of the partial sample limited to the 18 developed countries analyzed by Cecchetti, Mohanty, and Zampolli (2011) has been carried out. Their fixed effect panel analysis showed that the national debt ratio negatively affects economic growth rate. This negative relationship is also observed in Figure IV-3, which shows a simple correlation between the two variables. If the national debt ratio increases by 10%p, the economic growth rate decreases by 0.05%p, which is statistically significant at a significance level of 5%.

However, as can be seen from the earlier correlation analysis, it is possible that the above-mentioned significant correlation has been derived by some countries included in the analysis. In the above sample, there are two countries with relatively extreme values compared to other countries. In Greece, economic growth was very low compared to other countries. Japan, on the other hand, has considerably more national debt than other countries. The inclusion of these two countries may have affected the analysis results.
A n  A n a l y s i s  o f  N a t i o n a l  D e b t  a n d  E c o n o m i c  G r o w t h

-0.05  0  0.05

Growth Rate

0  0.00  0.50  1.00  1.50  2.00

Debt-to-GDP Ratio

Greece Japan

(Growth Rate) = 0.019 - 0.005 * (Debt-to-GDP Ratio)

[Figure IV-3] Correlation between Economic Growth Rate and the National Debt Ratio (18 Developed Countries)

Note: The standard deviation of slope estimates is 0.0020, which is statistically significant at the 5% level.

We can confirm the difference by comparing [Figure IV-3] and [Figure IV-4]. In analyzing the sample of advanced countries, Japan and Greece played an important role. In the analysis of the 16 countries excluding both countries from the sample, the impact of the national debt ratio disappeared. It shows that the regression result is sensitive to the scope of countries analyzed even in the case of the analysis of advanced countries.

In an analysis that controlled for other variables, only models (ADV-2) and (ADV-4) which included the proportion of dependent population as a control variable showed that the national debt ratio has a significant effect on economic growth. In the models ADV-2 and ADV-4, when the national debt ratio increases by 10%p, the economic growth rate decreases by 0.07%p and 0.14%p, respectively, which is statistically significant at the 10% and 5% significance level. Cecchetti, Mohanty, and Zampolli (2011) used all the control variables as in the regression analysis model (ADV-4). The results of this study are similar to those of Cecchetti, Mohanty, and Zampolli (2011).
However, the regression models except for ADV-2 and ADV-4 in <Table IV-4> showed no significant effects of the national debt ratio. In particular, in the sample of 16 countries except Japan and Greece, the correlation between the national debt ratio and economic growth rate disappears in all the analytic results. That is, the results of Cecchetti, Mohanty, and Zampolli (2011) are sensitive to the selection of the variables and the countries included in the analysis.

Korea is classified as a small open economy that is easily influenced by changes in the external economic environment. Unlike countries such as the U.S. and Japan where the size of the economy and the domestic market are large, the high national debt ratio can work against them more sensitively through external credibility in the case of small open economies. Therefore, a partial sample analysis was conducted for 15 countries classified as small open economies like Korea.
## Table IV-4: Correlation between Economic Growth Rate and the National Debt Ratio (Developed Countries)

<table>
<thead>
<tr>
<th></th>
<th>18 Developed Countries</th>
<th>16 Developed Countries except Japan and Greece</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model (ADV-1)</td>
<td>Model (ADV-2)</td>
</tr>
<tr>
<td>National debt ratio</td>
<td>-0.0069 (0.0062)</td>
<td>-0.0071 (0.0040)</td>
</tr>
<tr>
<td>Real GDP per capita</td>
<td>-0.1311*** (0.0216)</td>
<td>-0.1537*** (0.0151)</td>
</tr>
<tr>
<td>Total savings/GDP</td>
<td>0.0465 (0.0063)</td>
<td>0.0427 (0.0058)</td>
</tr>
<tr>
<td>Average education period</td>
<td>-0.0092 (0.0068)</td>
<td>-0.0077 (0.0062)</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>-0.0714* (0.0366)</td>
<td>-0.0236 (0.0359)</td>
</tr>
<tr>
<td>Openness</td>
<td>0.0098 (0.0082)</td>
<td>0.0114 (0.0073)</td>
</tr>
<tr>
<td>Population increase rate</td>
<td>-0.1926 (0.2907)</td>
<td>-0.4929 (0.2872)</td>
</tr>
<tr>
<td>Current liabilities/GDP</td>
<td>-0.0066 (0.0049)</td>
<td>-0.0079 (0.0046)</td>
</tr>
<tr>
<td>Percentage of dependent population</td>
<td>-0.1365*** (0.0373)</td>
<td>-0.1365*** (0.0278)</td>
</tr>
<tr>
<td>Financial crisis period</td>
<td>-0.0016 (0.0005)</td>
<td>-0.0018 (0.0005)</td>
</tr>
<tr>
<td>Constant</td>
<td>1.4206*** (0.2022)</td>
<td>1.7053*** (0.1536)</td>
</tr>
<tr>
<td>Observed value</td>
<td>514</td>
<td>514</td>
</tr>
<tr>
<td>R²</td>
<td>0.7533</td>
<td>0.7764</td>
</tr>
</tbody>
</table>

Notes: 1. The dependent variable is the economic growth rate.
2. The numbers in parenthesis are cluster robust standard errors and ***, **, and * represent statistical significance at the significance levels of 1%, 5%, and 10% respectively.
First, we examined the correlation between the national debt ratio and the economic growth rate in [Figure IV-5]. In the case of small open economies, if the national debt ratio increases by 10%p, the economic growth rate decreases by 0.12%p, which is statistically significant at the 1% level.

\[ \text{(Growth Rate)} = 0.029 - 0.012 \times \text{(Debt-to-GDP Ratio)} \]

[Figure IV-5] Correlation between Economic Growth Rate and the National Debt Ratio (15 Open Economy Countries)

Note: The standard deviation of slope estimates is 0.0029, which is statistically significant at the 1% level.

Even in the case of small open economies, different results can be derived depending on whether or not a specific country is included in the analysis. Korea and Greece were identified to be exceptional countries that have influence on the result of the analysis in the previous all-sample analysis and the developed country sample analysis respectively. In [Figure IV-5] where Korea and Greece are included, we can see a strong negative correlation between the national debt ratio and economic growth rate.

In the analysis of the small open economies, [Figure IV-6] presents the analytic results of 13 countries excluding both countries. In this case, the negative
relationship between the national debt ratio and economic growth disappears. It is the same here that the results are sensitive to the sample of countries included in the case of small open economies.

\[
\text{(Growth Rate)} = 0.021 - 0.001 \times \text{(Debt-to-GDP Ratio)}
\]

As with the previous analysis, there is no clear evidence that the national debt ratio negatively affects the economic growth rate in the regression analysis considering other factors. However, in the analysis of the sample of 13 countries excluding Korea and Greece, there is a negative correlation when both the ratio of dependent population and the financial crisis period are included as other variables (SOE-8). But the statistical significance is not high.
(Table IV-5) Correlation between Economic Growth Rate and the National Debt Ratio (Small Open Economy)

<table>
<thead>
<tr>
<th></th>
<th>15 Small Open Economy Countries</th>
<th>13 Countries except Korea and Greece</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Model (SOE-1)</td>
<td>Model (SOE-2)</td>
</tr>
<tr>
<td>National debt ratio</td>
<td>0.0065</td>
<td>0.0080</td>
</tr>
<tr>
<td></td>
<td>(0.0056)</td>
<td>(0.0047)</td>
</tr>
<tr>
<td></td>
<td>0.0017</td>
<td>0.0013</td>
</tr>
<tr>
<td></td>
<td>(0.0044)</td>
<td>(0.0037)</td>
</tr>
<tr>
<td></td>
<td>0.0068</td>
<td>-0.0007</td>
</tr>
<tr>
<td></td>
<td>(0.0083)</td>
<td>(0.0064)</td>
</tr>
<tr>
<td></td>
<td>-0.0001</td>
<td>-0.0031</td>
</tr>
<tr>
<td></td>
<td>(0.0079)</td>
<td>(0.0056)</td>
</tr>
<tr>
<td>Real GDP per capita</td>
<td>-0.0610</td>
<td>-0.0844</td>
</tr>
<tr>
<td></td>
<td>(0.0181)</td>
<td>(0.0134)</td>
</tr>
<tr>
<td></td>
<td>-0.0867</td>
<td>-0.1036</td>
</tr>
<tr>
<td></td>
<td>(0.0191)</td>
<td>(0.0165)</td>
</tr>
<tr>
<td></td>
<td>-0.0458</td>
<td>-0.1091</td>
</tr>
<tr>
<td></td>
<td>(0.0307)</td>
<td>(0.0242)</td>
</tr>
<tr>
<td></td>
<td>-0.0393</td>
<td>-0.1481</td>
</tr>
<tr>
<td></td>
<td>(0.0336)</td>
<td>(0.0239)</td>
</tr>
<tr>
<td>Total savings/GDP</td>
<td>0.1259</td>
<td>0.1183</td>
</tr>
<tr>
<td></td>
<td>(0.0577)</td>
<td>(0.0549)</td>
</tr>
<tr>
<td></td>
<td>0.0802</td>
<td>0.0806</td>
</tr>
<tr>
<td></td>
<td>(0.0592)</td>
<td>(0.0602)</td>
</tr>
<tr>
<td></td>
<td>0.0974</td>
<td>0.0942</td>
</tr>
<tr>
<td></td>
<td>(0.0590)</td>
<td>(0.0588)</td>
</tr>
<tr>
<td></td>
<td>0.0865</td>
<td>0.0893</td>
</tr>
<tr>
<td></td>
<td>(0.0725)</td>
<td>(0.0714)</td>
</tr>
<tr>
<td>Average education period</td>
<td>0.0039</td>
<td>-0.0012</td>
</tr>
<tr>
<td></td>
<td>(0.0071)</td>
<td>(0.0049)</td>
</tr>
<tr>
<td></td>
<td>0.0102</td>
<td>0.0070</td>
</tr>
<tr>
<td></td>
<td>(0.0070)</td>
<td>(0.0072)</td>
</tr>
<tr>
<td></td>
<td>0.0032</td>
<td>-0.0011</td>
</tr>
<tr>
<td></td>
<td>(0.0067)</td>
<td>(0.0065)</td>
</tr>
<tr>
<td></td>
<td>0.0088</td>
<td>0.0057</td>
</tr>
<tr>
<td></td>
<td>(0.0079)</td>
<td>(0.0081)</td>
</tr>
<tr>
<td>Inflation rate</td>
<td>-0.0082</td>
<td>-0.0061</td>
</tr>
<tr>
<td></td>
<td>(0.0017)</td>
<td>(0.0009)</td>
</tr>
<tr>
<td></td>
<td>-0.0041</td>
<td>-0.0032</td>
</tr>
<tr>
<td></td>
<td>(0.0017)</td>
<td>(0.0010)</td>
</tr>
<tr>
<td></td>
<td>-0.0072</td>
<td>-0.0058</td>
</tr>
<tr>
<td></td>
<td>(0.0018)</td>
<td>(0.0012)</td>
</tr>
<tr>
<td></td>
<td>-0.0040</td>
<td>-0.0031</td>
</tr>
<tr>
<td></td>
<td>(0.0021)</td>
<td>(0.0014)</td>
</tr>
<tr>
<td>Openness</td>
<td>-0.0060</td>
<td>0.0028</td>
</tr>
<tr>
<td></td>
<td>(0.0113)</td>
<td>(0.0096)</td>
</tr>
<tr>
<td></td>
<td>-0.0121</td>
<td>-0.0093</td>
</tr>
<tr>
<td></td>
<td>(0.0143)</td>
<td>(0.0146)</td>
</tr>
<tr>
<td></td>
<td>-0.0080</td>
<td>0.0007</td>
</tr>
<tr>
<td></td>
<td>(0.0117)</td>
<td>(0.0106)</td>
</tr>
<tr>
<td></td>
<td>-0.0081</td>
<td>-0.0037</td>
</tr>
<tr>
<td></td>
<td>(0.0171)</td>
<td>(0.0171)</td>
</tr>
<tr>
<td>Population increase rate</td>
<td>-0.6471</td>
<td>-0.6440</td>
</tr>
<tr>
<td></td>
<td>(0.3047)</td>
<td>(0.3573)</td>
</tr>
<tr>
<td></td>
<td>-0.7637</td>
<td>-0.6991</td>
</tr>
<tr>
<td></td>
<td>(0.3939)</td>
<td>(0.3548)</td>
</tr>
<tr>
<td></td>
<td>-0.9380</td>
<td>-0.7776</td>
</tr>
<tr>
<td></td>
<td>(0.2118)</td>
<td>(0.2709)</td>
</tr>
<tr>
<td></td>
<td>-0.8041</td>
<td>-0.6094</td>
</tr>
<tr>
<td></td>
<td>(0.4722)</td>
<td>(0.3723)</td>
</tr>
<tr>
<td>Current liabilities/GDP</td>
<td>-0.0080</td>
<td>-0.0042</td>
</tr>
<tr>
<td></td>
<td>(0.0069)</td>
<td>(0.0062)</td>
</tr>
<tr>
<td></td>
<td>-0.0081</td>
<td>-0.0049</td>
</tr>
<tr>
<td></td>
<td>(0.0057)</td>
<td>(0.0059)</td>
</tr>
<tr>
<td></td>
<td>-0.0078</td>
<td>-0.0072</td>
</tr>
<tr>
<td></td>
<td>(0.0066)</td>
<td>(0.0061)</td>
</tr>
<tr>
<td></td>
<td>-0.0063</td>
<td>-0.0057</td>
</tr>
<tr>
<td></td>
<td>(0.0066)</td>
<td>(0.0064)</td>
</tr>
<tr>
<td>Percentage of dependent population</td>
<td>-0.1797***</td>
<td>-0.1193</td>
</tr>
<tr>
<td></td>
<td>(0.0621)</td>
<td>(0.0727)</td>
</tr>
<tr>
<td></td>
<td>-0.1969</td>
<td>(0.0649)</td>
</tr>
<tr>
<td></td>
<td>(0.0615)</td>
<td>(0.0649)</td>
</tr>
<tr>
<td></td>
<td>0.0026</td>
<td>-0.0025</td>
</tr>
<tr>
<td></td>
<td>(0.0012)</td>
<td>(0.0012)</td>
</tr>
<tr>
<td></td>
<td>0.0028</td>
<td>-0.0024</td>
</tr>
<tr>
<td></td>
<td>(0.0016)</td>
<td>(0.0016)</td>
</tr>
<tr>
<td>Financial crisis period</td>
<td>0.5583</td>
<td>0.9232</td>
</tr>
<tr>
<td></td>
<td>(0.1306)</td>
<td>(0.1499)</td>
</tr>
<tr>
<td></td>
<td>0.7342</td>
<td>1.0293</td>
</tr>
<tr>
<td></td>
<td>(0.1369)</td>
<td>(0.1623)</td>
</tr>
<tr>
<td></td>
<td>0.4253</td>
<td>1.1896</td>
</tr>
<tr>
<td></td>
<td>(0.2623)</td>
<td>(0.2474)</td>
</tr>
<tr>
<td></td>
<td>0.8510</td>
<td>1.5097</td>
</tr>
<tr>
<td></td>
<td>(0.2761)</td>
<td>(0.2463)</td>
</tr>
<tr>
<td>Observed value</td>
<td>422</td>
<td>422</td>
</tr>
<tr>
<td></td>
<td>363</td>
<td>363</td>
</tr>
<tr>
<td></td>
<td>362</td>
<td>362</td>
</tr>
<tr>
<td></td>
<td>311</td>
<td>311</td>
</tr>
<tr>
<td>R²</td>
<td>0.5834</td>
<td>0.6345</td>
</tr>
<tr>
<td></td>
<td>0.6049</td>
<td>0.6278</td>
</tr>
<tr>
<td></td>
<td>0.5439</td>
<td>0.5970</td>
</tr>
<tr>
<td></td>
<td>0.5405</td>
<td>0.5809</td>
</tr>
</tbody>
</table>

Notes: 1. The dependent variable is the economic growth rate.
2. The numbers in parenthesis are cluster robust standard errors and ***, **, and * represent statistical significance at the significance levels of 1%, 5%, and 10% respectively.
In the above, we analyzed the correlation between the national debt ratio and economic growth rate for all countries, developed countries, and small open economies. When only simple correlations are analyzed without considering other variables, the results are very sensitive to the inclusion of specific countries in each sample. In particular, Korea and China have had relatively high economic growth rates and are financially sound. Japan and Greece have had low economic growth rates and high national debt ratios. These countries have a significant impact on the analysis results. In addition, we found that there was no clear evidence for the effect of national debt ratio on economic growth rate when we considered other variables affecting economic growth and unobserved characteristics of countries that could not be taken into account in simple correlation analysis.

An analysis of the effect of national debt ratio on economic growth has received much attention due to Reinhart and Rogoff (2009), who argued that countries with a national debt ratio over 90% had a lower economic growth rate than otherwise. They presented their conclusion by simple correlation analysis using basic statistics. However, as shown earlier, the analysis of Reinhart and Rogoff (2010) was likely to reveal a sensitive response to the composition of the sample.

The existence of the threshold effect proposed by Reinhart and Rogoff (2009) can also be sensitive to the composition of the sample. [Figure IV-7] examines the possibility of a threshold effect in a sample of 18 developed countries by simple correlation analysis. It seems that there is a structural change in the correlation between the national debt ratio and economic growth rate around 100% level. If the national debt ratio is lower than 100%, there is no significant correlation between the national debt ratio and economic growth rate. However, if it is higher than 100%, when the national debt ratio increases by 10%p, economic growth rate decreases by 0.04%p. This is statistically significant at the 5% level. These results are similar to those obtained by Cecchetti, Mohanty, and Zampolli (2011) in the analysis of the same 18 developed countries, which yielded a threshold national debt ratio of 96%.

However, this threshold effect disappears when Japan and Greece are removed from the sample. As shown in [Figure IV-8], there is no clear evidence that the correlation between the national debt ratio and economic growth rate
changes at a certain level of the ratio. In other words, the analysis of the threshold effect is likely to be sensitive to the sample, like the analysis of the correlation between the national debt ratio and economic growth.

\[ (\text{Growth Rate}) = 0.016 + 0.003 \times (\text{Debt/GDP} < 1) - 0.004 \times (\text{Debt/GDP} \geq 1) \]

[Figure IV-7] Threshold Effect of the National Debt Ratio [18 Developed Countries]

Notes: 1. If the national debt ratio is low, the standard deviation of the slope is 0.0032, which is not statistically significant at the 10% significance level.
2. If the national debt ratio is high, the standard deviation of the slope is 0.0020, which is statistically significant at the 5% significance level.

In the analysis using the national panel data, it is assumed that there is a national debt ratio that can be commonly considered to be a threshold applied to all the countries. However, due to the inherent characteristics of each country, if the assumption cannot be held, wrong results can be derived. [Figure IV-9] shows the correlation between the national debt ratios and economic growth rates of Japan and Greece. In the case of Japan, there seems to be a structural change at around 70% level. It seems to be at around 100% level in the case of Greece. That is, the threshold is very likely to vary from country to country. Therefore, the efforts to derive a common threshold national debt ratio by constructing panel data with many countries is probably futile.
An Analysis of National Debt and Economic Growth

[Figure IV-8] Correlation between Economic Growth Rate and the National Debt Ratio (18 Developed Countries except Japan and Greece)

\[(\text{Growth Rate}) = 0.017 - 0.001 \times (\text{Debt/GDP}<1) - 0.002 \times (\text{Debt/GDP}\geq1)\]

Notes:
1. If the national debt ratio is low, the standard deviation of the slope is 0.0032, which is not statistically significant at the 10% significance level.
2. If the national debt ratio is high, the standard deviation of the slope is 0.0023, which is not statistically significant at the 10% significance level.

[Figure IV-9] Threshold Effect of the National Debt Ratio (Japan and Greece)
Implications

Many studies on the effects of national debt on economic growth since Reinhart and Rogoff (2009) were primarily, focusing on the correlation between the two variables. However, recent research has evolved into a study that takes into account the causal relationship between the two variables. Majority of the studies found no clear evidence that national debt negatively affects economic growth. But negative impacts are found in certain samples because it is country-specific. Therefore, further research is required to determine which factors are responsible for making the economic growth rate respond sensitively to the national debt ratio in each country.

Of course, the absence of a clear correlation between the national debt ratio and economic growth rate does not relieve the government from sound management of public financing. In fact, the relationship between national debt ratio and economic growth rate can have different impacts on economic growth depending on how the government spends funds raised through bond issuance. Therefore, it is not easy to uniformly establish the correlation between the two variables.

As Delong and Summers (2012) suggested, it is important for Korea whether we can increase our potential growth rate through a fiscal deficit. Checherita-Westphal et al. (2012) estimated the optimal national debt ratio that maximized economic growth rate. They argued that an increase in the national debt ratio can have a positive impact on economic growth, when the government spends the funds financed by bond issuance in investments in public capital accumulation and if the marginal productivity of public capital is high. In Korea, however, the steady expansion of demand for welfare spending due to low fertility and aging is considered to be a major factor in increasing the national debt ratio. As long as welfare spending does not directly increase the potential growth rate, the high national debt ratio will be a considerable burden on future fiscal policy. Therefore, we need to manage our public finances in a sound way and pay careful attention to the fiscal deficit.
Implications for Korea's Macroeconomic Policy

1 Lessons from the Perspective of Economics

Reinhart and Rogoff (2009) classified the economic crisis into the following categories: the government debt crisis, the banking crisis, the inflation crisis, and the foreign exchange crisis. These crises might differ in their size and impact on the economy, but they found that it was more common to happen periodically rather than exceptionally. Romer (2014) also pointed out that in the past, the U.S. had endured six financial crises over the past 30 years, and that the financial crises were not exceptional, but ordinary.

Akerlof (2014) classified recessions into financial recession and normal recession by citing Jorda et al. (2011), that examined the economic fluctuations of 14 developed countries from 1870 to 2008. He pointed out that not only financial recessions were longer and more severe, but also the rate of recovery was slower as the credit/GDP ratio before the recession was larger.55)

Previous research suggested that economic crises occurred periodically, especially in the financial sector, where the crisis was more severe. At the time of the financial crisis, U.S. Treasury Secretary Hank Paulson asserted that a financial crisis would come again.56) Robert Lucas argued in 2003 that we no

---

55) Jorda et al. (2011) pointed out those different results depended on how to measure credit. If credit is defined as bank loans to the private sector, the U.S. economic recovery after the recent financial crisis is about 1% of GDP better than the average recovery, and if credit from the shadow financial system is included in the credit, they derived a result that is 4% better than the median of the recovery (Akerlof (2014), p.318).
longer needed to worry about economic fluctuations. Would it be an overconfidence of an individual or a limit to the level of economic analysis or methodology?

After Keynes asserted government intervention in response to market failures during the Great Depression of the 1930s, Friedman's monetarism emerged after World War II when everything was solved in the marketplace during the heyday of the U.S. economy. The monetarists showed conflicting views with the Keynesians by insisting that government intervention be minimized and that everything should be left to the market. Since then, the emergence of New Keynesians and the neoclassical school has converged in some theories in that the rationality of economic entities and market efficiency are basic premises, and this trend has been linked to neoliberalism. Although neoliberalism is a broader term that encompasses economics, it has become the theoretical basis for policies such as deregulation and market opening based on absolute trust in the market, resulting in consecutive neoliberal policies that has brought about the global financial crisis.

In terms of methodology, different macroeconomic theories since Keynes have become more dependent on mathematics to make concise and clearer conclusions. Keynes argued in the General Theory that “human decisions that affect the future cannot rely on strict mathematical expectations, whether they are personal, political, or economic, because there is no basis for such calculations.”57) However, economists have continued to try to explain human decisions more scientifically. Turner (2016) argued that although economics cannot keep up with Newton's criteria for mathematical rigor, the “follow-up to physics” of economics due to “physics envy” leads to self-confidence that is risky and the certainty of conclusions cannot be justified.58) Krugman (2009) also pointed out that economists as a group make the mistake of believing the impressiveness of the use of mathematics as the truth.

Mathematical models have flourished since Friedman's remark that the

---

57) Turner(2016), p.250
58) ibid, p.250
reality of assumptions in constructing a theoretical economic model were not important, but the simplicity of the model and the accuracy of predictions were important. However, to construct a theoretical model, the real conditions must be considerably simplified. In addition, several additional assumptions are added for the technical completion to derive mathematical solutions for the model. While these are all described in a paper or report, policymakers tend to ignore these complex constraints and concentrate only on the direction of the prediction that the conclusions give. As a result, policies that are not effective in reality often be adopted.

These notions are not merely a critique of economics up until now but are attempts to discover the problems of past theories and policies and seek new directions in the face of the financial crisis. There have been numerous discussions and criticisms of macroeconomics itself since the financial crisis. The problem in theory most commonly pointed out is that the majority of theories are based on human rationality and market efficiency. However, human rationality can vary depending on time and place. For example, the herd behavior of humans may not be reasonable in a normal period, but in a crisis, it may increase the probability that they survive by following other’s behavior. Then it can be a reasonable act at those times. Considering that the definition of human rationality, not human irrationality, can also be different in accordance with conditions and that market failures can occur, it is necessary to take a more prudent approach to the conclusions we draw. This is the big lesson the global financial crisis gives to economists. If economic crises break out on a periodic basis and not exceptional phenomena, then to find a new economic framework to explain them as part of economic fluctuations will be a challenge we are facing in economic theory.


2 Implications from the Perspective of Policy

Facing an economic situation, which differs greatly from conventional ones before the global financial crisis, we started to monitor the international debates on policy effectiveness. What were the problems of existing macroeconomic theory and policy, whether those nontraditional policies are effective are some of the questions we tried to find the answers. The international debates on each of these issues are still going on and it is early for us to derive conclusions. Therefore, in this report, we will present these issues at present stages of discussions and examine the policy challenges facing Korean government.

A. Macroprudential Policy

The most important issue in macroprudential policy is the expansion of the capital of financial institutions. Paulson (2013) believed that it was absolutely necessary to raise capital to prevent the recurrence of financial crises, and that it was also necessary to provide enough liquidity in case of emergency.60) Paulson emphasized the need not only to rely on supervision but also to strengthen market discipline so that institutions can resolve their problems before things get worse.61)

Bair (2012) suggested that the Basel III Convention should be thoroughly implemented and that large banks (SIFIs) should have extra capital in addition to capital that meets capital requirements.62) She also suggested that Congress should mandate that all financial institutions with assets over $50 billion63) maintain a uniform 8% BIS ratio.64) Bair also suggested dividing up the

62) Bair(2012), pp.324~326
63) In addition to banks, bank holding companies, insurance companies, hedge funds, investment banks and private equity funds are also included.
64) op. cit., pp.324~326
megabanks, considering the problem of “too big to fail” of large financial institutions. The commercial banking sector should be operated by insured banks and other sectors such as securities, derivative products and insurance should be separately operated by independent subsidiaries.65)

Korean banks have also been trying to increase their size, whether voluntarily or not, by increasing their capital for international competitiveness. After experiencing the financial crisis, we also know that the bigger the size of financial institution is, the higher the probability of getting bailout funds. From the viewpoint of a regulatory authority, the bigger the size of financial institution is, the harder the authority liquidates it. In reality, it is unlikely that Korean banks will become megabanks in terms of international standard. So we think that it is more realistic to develop specialized fields by finding niche markets for each bank rather than to focus on increasing the size of the bank.

One more topic to be addressed in relation to macro-prudential policies is capital control. As a small open economy where the capital market is fully open, the Korean financial market is affected by the rapid movements of foreign capital. Hence Korea introduced a set of macroprudential measures to curb short-term borrowings. The macroprudential stability levy, regulation on forward exchange positions, and taxation on bond investments by foreigners are such measures.66) Korea also has foreign exchange swap agreements with other countries. However, since the IMF recognizes the effectiveness of capital control as a measure against sudden capital movements after the financial crisis, capital control measures can be considered as an additional measure. The introduction of a foreign exchange transaction tax, such as the “zero-rate two-tier Tobin tax” proposed by Hong and Lee (2012), can be one of those measures of capital control.67)

65) ibid., pp.328~331
66) These measures are called “three-piece set” of stabilizing tools.
67) The zero-rate two-tier Tobin tax refers to a foreign exchange transaction tax that is levied at a low tax rate for foreign exchange transactions in the normal times, but levied at a higher rate in the event of a sudden exchange rate change due to rapid capital inflows and outflows. Here, it is the zero-rate two-tier Tobin tax where the low tax rate is set to zero. For more information on the structure of the zero-rate two-tier Tobin tax, see Hong and Lee (2012).
B. Monetary Policy

At present, Korea is already concerned about the direction to take for an interest rate policy with already low interest rates. Although there are claims that additional interest rate cuts are needed to stimulate the economy, it is more likely that further rate cuts will not be effective. It is believed that low investment is not because the interest rate is high, but because investment conditions are uncertain. On the other hand, some argue that Korea should raise interest rates preemptively while a U.S. interest rate hike is foreseen. However, these arguments cannot be easily implemented because of its impact on household debt, which amounted to 1,257.3 trillion won as of the end of June 2016.

It is worth pointing out that the negative interest rate policy implemented by some countries may not produce results as originally intended. In particular, in the case of a country with an aging population structure like Japan, the introduction of negative interest rates does not increase consumption, but rather spreads anxiety about the future and thus increases savings.68)

If we look at the implications related to monetary policy at this stage, it is important to secure the capacity to adjust the policy rate in advance. As the economy recovers, it is necessary to raise the interest rate at an appropriate point in time and secure the leeway to prepare for the next recession. To this preparation, judgments and predictions about the future course of economy should be correct. However, since the current macroeconomic models do not fully incorporate the mechanisms of the financial sector, it is expected that predicting a crisis in advance will be difficult until a theoretical breakthrough is made.69) Until then we have to rely on experienced hands policywise while sticking to the principles most of the time.

68) In addition to Japan, Germany, Denmark, Sweden and Switzerland, which are subject to negative interest rates, have had the highest savings rates since 1995. (The Wall Street Journal, “Are Negative Rates Backfiring? Here’s Some Early Evidence,” Aug. 8, 2016)

69) Blanchard(2014) pointed out that efforts to combine the financial sector with the macro model are underway, but are not yet successful (p. 322). Turner (2016) sees the reason for not dealing enough with the financial sector in a macro model is because mathematically smooth results can be achieved by doing so. By neglecting the financial sector, the DSGE model can explain the interaction between representative households and representative firms and the impact of external shocks (p. 246).
In the case of small open economy such as Korea, there is a constraint in interest rate adjustment. Korea should take into account not only domestic economic conditions but also the interest rate movements of major economies such as the U.S. and Europe. In the case of the U.S., we have seen that the subjective judgments of each member of the FOMC are absolutely crucial rather than various statistics and staff analysis when they decide the policy rate. Since the quality of an individual member of the Monetary Policy Board\(^\text{70}\) is so important, it is possible to consider ways to have the MPB candidates go through a hearing in the National Assembly when they are appointed. The Bank of Korea is aware of the problem of the current sectoral recommendation system and suggests the need for institutional restructuring. It is also important to create an environment where individual member of the MPB can make independent judgments.

In carrying out monetary policy, the central bank aims to achieve a policy goal of stabilizing prices by directly targeting policy rates. The central banks of most countries, including BOK, have one policy goal and one policy tool.\(^\text{71}\) However, in the case of the United States, it has two policy goals of increasing employment along with price stability with one policy tool. As the stable relationship between inflation and economic growth turns out to be no longer valid after the financial crisis, discussions are underway to reestablish the relationship between monetary policy goals and the tools.

It is not clear whether the current monetary easing policy in Korea is not effective due to liquidity trap or due to broken relationship between inflation rate and economic growth. We have to reexamine the relationship in a new perspective. It is also worth reviewing whether to maintain the policy goal as price stability only. And we need to examine whether it is desirable to explicitly include macroeconomic variables in policy objectives.

\(^{70}\) Korean version of FOMC

\(^{71}\) A provision that the Bank of Korea should keep an eye on financial stability under the amendment of the Bank of Korea Act of 2011 was added as Article 1, Clause 2. And a provision on financial stability was added to the central bank’s responsibilities in most countries after the financial crisis. However, the first goal is to maintain stable price level, because there may be contradictory aspects in achieving both price stability and financial stability.
C. Fiscal Policy

Although fiscal policy is not suitable for short-term and quick response to economic environment changes, it is inevitable to use fiscal policy to stimulate the economy for a certain period of time. In particular, in an economic crisis in which monetary policy is ineffective due to liquidity trap, it is generally accepted that a more expansionary fiscal policy should be utilized. However, if a long-term expansionary fiscal policy seriously undermines fiscal soundness, it could lead to a long-term recession, like in Japan. Therefore, if fiscal policy plays a role in economic recovery, it will be necessary to turn to tightening at an appropriate time to secure fiscal reserves for the next recession. In other words, in the mid to long term, fiscal management should always be carried out with fiscal soundness in mind.

The question is what the criteria will be for judging whether the economy is recovering or out of crisis. And how fast the deficit and national debt are to be reduced is hard to be answered. In the fourth chapter of this study, empirical analysis of the relationship between national debt and economic growth shows that the threshold effect, such as 90% of Rheinhart and Rogoff, cannot be confirmed. Also the relationship between national debt and economic growth varies depending on the characteristics of each country. Additional research is desirable to find out which factors among each country's characteristics determine the relationship between national debt and economic growth.

According to Eiji (2016), the start of the lost two decades in Japan was wage cuts and shortage of demand due to the burst of the bubble. Thereafter a vicious cycle of deflation caused by these factors continued. As deflation continued, the government invested in SOC with the expanded fiscal spending, but the change in demographic structure such as low fertility and aging did not increase aggregate demand. In addition, the increase in welfare spending due to aging and the increase in unemployment benefit have become a large part of government spending, resulting in the world's highest debt-to-GDP ratio of over 200%. In this process, household and government debt increased and

---

72) Roubini(2014) emphasized the use of fiscal policy by pointing out that there is growing research showing that the financial multiplier is greater with a zero interest rate policy.
the total savings of corporations increased.\textsuperscript{74)

In Korea, the balance sheets of households, corporations and the government are similar to those of Japan. Given the fact that the population structure, which is characterized by low fertility and aging, is changing at a faster pace than Japan, we should pay more attention to fiscal management.

D. Curbing Financial Excess

The windfall effect of the global financial crisis is that more people become aware of the need to take some measures for financial excess. The movement toward financial deregulation, symbolized by the UK's Big Bang in the 1980s, brought about the abolition of the Glass-Steagall Act in 1999 along with the wave of neo-liberalism. Financial deregulation opened the era of financial excess through the Great Moderation period. However, there had been concern about financial excess even before the Big Bang. Tobin (1984) had mentioned that more and more resources and young people were attracted to financial activities with unusually high financial gains in private benefits relative to its social productivity even if the activities were not related to the production of goods and services.\textsuperscript{75) Wolf (2009) pointed out that the U.S. financial sector has grown more than six times faster than GDP growth over the past 30 years and that finance has been leading the real economy.\textsuperscript{76) Romer (2014) pointed out that the financial sector is a constant source of shock in historical terms and that the benefits of financial innovation are not as great as the costs that the sector imposes on the real economy. Volcker even mentioned that the only financial innovation in the last 40 years was the ATMs.

Archand et al. (2012) analyzed the empirical relationship between financial excess and economic growth, using the ratio of credit for private sector to GDP as a surrogate variable for financial excess. The result showed that,

\textsuperscript{73) The household saving rate was –1.3% in 2013.
\textsuperscript{74) The ratio of corporate gross savings to GDP in Japan was more than 20% in 2014, almost twice that of other European countries and America.
\textsuperscript{75) Tobin(1984), p.14
\textsuperscript{76) Martin Wolf, "Why dealing with the huge debt overhang is so hard?" Financial Times, Jan. 27, 2009.
if the ratio exceeds 80~100% of GDP, the effect of financial excess on growth will be negative. Korea was also pointed out to be one of the countries where financial excess is more than 100%. That is why Korea also has to pay attention to the problem of financial excess.

Before the outbreak of the financial crisis, the complexity of transactions through financial derivative products has made it difficult to grasp the total amount of insolvency. While financial derivative instruments have the inherent positive function of transferring risk, they are overly complicated and often used for speculation. Most recently, Deutsche Bank, the largest bank in Europe, is facing a bankruptcy crisis due to losses from derivative trading, as large financial institutions around the world have been facing bankruptcies due to losses from derivative trading.

Romer (2014) suggested imposing a Pigouvian tax on financial activities due to their negative externality, considering the cost of the financial shock to the real economy. Whether a Pigouvian tax on the financial industry is a transaction tax or a surcharge, it is urgent to correct the negative externality of the financial sector. It is also necessary to strengthen the supervision of financial institutions and make institutional arrangements to curb financial excess. Because if proper regulation does not work, the bubble in the financial market gets bigger and the shock wave with the bubble bursts become also proportionally bigger, while the pain lasts for a longer time.

E. Politics and Economy

Policy is the product of politics. In particular, it can be said that taxation and fiscal policy are actually the result of political negotiations. In the midst of the global financial crisis, U.S. Treasury Secretary Henry Paulson asked the Congress to support the government so that it could respond sufficiently to the crisis and at an opportune time. However, he felt frustrated over delayed funding

---

77) See Archand et al. (2012) for various previous studies that have examined the relationship between the degree of financial excess and growth.

78) For more information on the bankruptcy of large financial institutions due to derivatives trading that occurred before the recent Deutsche Bank crisis, see Hong and Lee (2012), p.162.
due to political bickering and not being able to secure the funds at once and sufficiently. Paulson (2013) argued that it was necessary to improve the political process that governed economic policy in an atmosphere where bipartisan compromise was gradually disappearing in the U.S. politics.\(^\text{79}\) This is not a problem confined to the United States, and since the political process is also important in Korea, it is necessary to review the process to make a more efficient decision-making process.

In Europe, applying monetary policy equally to all member countries with different economic conditions makes the policy ineffective and leads to a political crisis. For example, Germany which is leading the European economy is certainly different from the PIIGS countries in many aspects of their economies. The European Union is structured in such a way that it is difficult to maximize the efficiency of economic policy. Because governments that are elected by the people and the policy makers in Brussel are not the same and as such the policies do not reflect the differences in member countries necessarily. Ultimately they have to decide whether to go for a more tight political union or rollback to the past. The lesson from the current European situation is that they have to move either way for more efficient economic policies.

The relationship between politics and economy, in which politics dominate, can be traced back to ancient times. Though there have been a lot of studies on the relationship, it is still difficult to find what kind of political system can maximize the efficiency of economic policy.\(^\text{80}\)

---

\(^\text{79}\) It is not certain what the solution for this ever more troubling political dysfunction is, but it is certain that we must find a way to improve the collective decision-making process in Washington. The stakes are simply too high not to. (p. 439)

\(^\text{80}\) For example, recently Bell(2015), citing the high economic growth rate of China, suggested a China model where meritocracy in the Chinese form can be a superior political system than democracy. But of course, his theory is just one of many different ideas.
Conclusion

This report examined the limitations of existing macroeconomic theories that were revealed in the course of overcoming the financial crisis and the effects of nontraditional economic policy instruments after the 2008 financial crisis. In the process of overcoming the Great Depression of the 1930s, various economic theories have been developed since Keynes proposed a new theory of macroeconomics. And there has also been a time of confidence in which big economic fluctuations were matters of the past with the Great Moderation era since the 1980s. However, since the global financial crisis in 2008, macroeconomic policy instruments for stabilizing the market and recovering from the recession, especially the traditional policy instruments used in monetary policy, have failed to show their desired results. And reflections and discussions on the financial crisis are still ongoing internationally. Hence, it would still take more time to find out what went wrong and what to do now in terms of policy.

However, based on the discussion up to now, we will look at the policy tasks given to us. If we look at the macroprudential policy first, it is important to enforce supervision strictly so that financial institutions have enough equity capital. No matter how much capital a financial institution has in a crisis, often it is not enough to afford chain effects, while the bankruptcy of large financial institutions results in tremendous social costs. Therefore, the expansion of equity capital is not a sufficient condition to prevent a financial crisis, but it is a necessary condition. Second, continued research on better alternatives to prevent the problem of “too big to fail” of large financial institutions is needed. Currently, proposals for the breakup of large financial institutions and making these institutions become
public corporations are being presented. It is urgent to analyze the feasibility of these approaches and to suggest new alternatives if necessary. Third, it is necessary to prepare for capital movements ahead of a U.S. rate hike. In particular, capital control as a countermeasure against capital movements can be said to have removed the old taboo through the financial crisis. In addition to the existing three-piece set of stabilizing tools in Korea, it is also necessary to review measures such as the “zero-rate two-tier Tobin tax.”

Korea has been gradually influenced by the global economic downturn as a small open economy. Uncertainty about the global economy is growing and our monetary policy choices are very limited. It is not expected that further interest rate cuts will be effective in an already low interest rate situation. Preemptive rate hikes cannot be easily done considering the domestic household debt problem ahead of a U.S. interest rate hike. We must consider whether the central bank's policy objectives will continue to be limited to price stability or broader macroeconomic variables should be included in explicit targets. In addition, as we have seen in the decision-making process of the U.S. FOMC, we recognize the importance of personal judgment of each member of the MPB in deciding the policy rate. Therefore, a review of the current way of selecting MPB members in Korea in terms of accountability, independence and representation is also necessary.

In terms of fiscal policy, the most important policy issue is how to balance the discretionary policy and fiscal soundness for short-term stimulus. This problem has been an important issue even before the financial crisis, but Korea has not received much attention because it is better than other developed countries in terms of fiscal soundness. In addition, the function of fiscal policy becomes more important in the situation where the effect of monetary policy cannot be expected due to liquidity trap. However, as shown in the fiscal dominance problem, it should be noted that if the single five-year government focuses on stimulating the economy in the short term, the problem of long-term fiscal

81) Christine Lagarde, the managing director of the IMF, referred to Korea, Germany and Canada as representative countries, claiming that countries with financial resources should lead growth through more aggressive fiscal spending. (*Financial Times,* "Christine Lagarde warns of global economic malpractice," Sep. 29, 2016)
soundness will always have to take a back seat. Moreover, given the fact that Korea is aging faster than Japan, the importance of this fiscal issue cannot be overstated.

It is a windfall lesson of the financial crisis for the world to realize the necessity for correcting financial excess. It is true that the financial industry has developed rapidly and created many jobs through deregulation and globalization under neo-liberalism. That's why it was not easy to talk about financial excess. There was little interest in financial excess as new jobs were created, the salaries of financial company CEOs increased to astronomical numbers, and the splendor of the financial industry was shining. However, the advent of the financial crisis has clearly shown the risk of financial excess. Rajan (2005), one of the few scholars who predicted the coming of a financial crisis, said that the development of new financial techniques made risk diversification easier. But he also pointed out that the possibility of exposure of the real economy to the crisis that started in the financial sector has increased, because the size of financial intermediation and the risk-taking behavior increased. The global financial crisis is a realization of his prophecy. Now that we have experienced systemic risks brought about by excessive financial transactions that are far bigger than the real economy, we believe it is time to resolve the problem of financial excess through proper regulation and supervision. Of course, in the U.S., which was the epicenter of the financial crisis, the Dodd-Frank Act strengthened regulation and supervision, but there is a prospect that Donald Trump will soon abolish the Dodd-Frank Act shortly after being elected president. But from a social standpoint, considering the costs imposed on the real economy by the financial shock, a series of adjustments such as strengthening regulations and supervision to reduce negative externality are necessary.

Finally, politics is an important factor to consider in developing policy, since it has an absolute impact on economic policy. In particular, in the case of fiscal policy, the influence of politics is absolute, because it has to be approved in the National Assembly. We have learned through history that it is difficult

---

to find a better political system to replace the current representative democracy in terms of representing the will of the people. However, there is always a conflict in politics because political parties vying for power in a democracy represent different support groups of people. Despite these inevitable conflicts, it would be nice if we could efficiently find harmonious policies through compromise. But the reality is not so simple not only in Korea but also other parts of the world. The search for a political process for an effective enforcement of economic policies to promote the well-being and welfare of the people is a challenge that must be solved, albeit it is a task of extreme difficulty.
Bibliography

Bair, Sheila, Bull by the Horns: Fighting to Save Main Street from Wall Street and Wall Street from Itself, New York: Simon & Schuster, 2012
_____. “Everything the IMF Wanted to Know about Financial Regulation and Wasn’t Afraid to Ask,” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.129~134
Blanchard, Oliver, “Rethinking Macroeconomic Policy,” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.321~333
Eberhardt, Markus, “Nonlinearities in the Relationship between Debt and Growth: (no)
Evidence from over Two Centuries,” 2016, Mimeo
Eberhardt, Markus, and Andrea F. Presbitero, “This Time They’re Different: Heterogeneity
and Nonlinearity in the Relationship between Debt and Growth,” MOFiR Working
Paper No. 92, 2013
ECB, Monthly Bulletin, 2010
Égert, Balázs, “Public Debt, Economic Growth and Nonlinear Effects: Myth or Reality?,”
Journal of Macroeconomics 43, 2015a, pp.226–238
______, “The 90% Public Debt Threshold: The Rise and Fall of a Stylized Fact,” Applied
Economics 47 (34-35), 2015b, pp.3756–3770
Eiji Tajika, “Japanese economy and Public Finance: What is the Root Cause of the Mounting
Public Debt and What to Do about It?” presented at the 11th Sejong Open Dialogue, June 2016
Elmendorf, Douglas W., and N. Gregory Mankiw. “Government Debt,” in Handbook of
Macroeconomics 1, ed. by J. B. Tayler and M. Woodford, 1999, pp.1615–1669
Friedman, Milton, “The Methodology of Positive Economics,” in Essays in Positive
Friedman, Milton & Anna Schwartz, A Monetary History of the United States, 1857-1960,
Geithner, Timothy, Stress Test: Reflections on Financial Crises, New York: Broadway Books,
2014
Herndon, Thomas, Michael Ash and Robert Pollin, “Does High Public Debt Consistently
Stifle Economic Growth? A Critique of Reinhart and Rogoff,” Cambridge Journal
of Economics 38 (2), 2014, pp.257–279
Hong, Beom-gyo & Sang-yeop Lee, A Study on the Introduction of FTT in Korea, Research
Report 12-03, Korea Institute of Public Finance, November, 2012
Johnson, Simon and James Kwak, 13 Bankers: The Wall Street Takeover and the Next
Financial Meltdown, New York: Pantheon Books, 2010
Jorda, Oscar, Moritz Schularick and Alan Taylor, “When Credit Bites Back: Leverage,
Kang, Yoo-duk, “Policy Responses of the ECB in Managing Euro Crisis and Change in
Its Role,” KIEP Working Papers on Regional Studies, Korea Institute for International
Economic Policy, 14-01, Dec. 22, 2014
Kim, Jong-man, “The Economic Stimulus Measures of the U.S. in 2008,” Korea Center
for International Finance, 2008
______, “The Exit Strategies of the U.S. Fed and the Expected Future Course,” Korea Center
for International Finance, 2009


Romer, David, “What Have We Learned about Fiscal Policy from the Crisis,” in *In the
Wake of the Crisis, ed. by Blanchard, Oliver et al., Cambridge: The MIT Press, 2012, pp.57–66

———, “Preventing the Next Catastrophe: Where Do We Stand?” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.327–333


———, “Fiscal Policy,” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.209–222


Varoufakis, Yanis, And the Weak Suffer What They Must, New York: Nation Books, 2016

Woodford, Michael, “Monetary Policy Targets after the Crisis,” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.55–62

Yellen, Janet, “Many Targets, Many Instruments: Where Do We Stand?” in What Have We Learned?: Macroeconomic Policy after the Crisis, ed. by Akerlof, George et al., Cambridge: The MIT Press, 2014, pp.31–35


Japanese Exchange Group(http://www.jpx.co.jp)

Japan National Tax Agency(http://www.nta.go.jp)


https://www.boj.or.jp/mopo/outline/qqe.htm/#p02


http://www.imf.org

http://databank.worldbank.org/data/