Stock Market and Macroeconomic Policies in Mongolia

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Abstract

Mongolian stock market is underdeveloped compared with its banking credit market, due to a lot of impediment factors to prevent its development. This means Mongolian economy still has much room where its stock market development promotes the long-term financing and investment into non-mining sectors for sustainable economic growth. This paper aims to provide the evidence on the relationship between stock market and macroeconomic policies in Mongolia under the hypothesis that the recent biases of fiscal and monetary policies would distort her stock-price formation. The empirical analysis in this study found that the cumulative public debt and too high policy rate have stagnated the stock prices, through identifying the negative impulse responses of stock prices to the shocks of policy rate and government securities under a vector-autoregressive model estimation. The strategic policy implication for normalizing the stock prices could be the significance in ensuring budget consolidation and in addressing a fear of floating in monetary policy management in Mongolia.

1   Introduction

The Mongolian economic system shifted from a centrally planned economy to a market-based economy in early 1990s, and a great number of political and economic reforms have been undertaken since then. Under the market-based regime, Mongolian economy has achieved 6.3 percent economic growth on the average in terms of real GDP

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for the period from 1993 to 2017.[2] One of the driving forces of rapid Mongolian economic growth has been her natural resource development in such mining sectors as gold, copper and coal. During the growth process, Mongolia has graded up its economic status from "low income" to "middle income" since 2007, according to the World Bank Classifications.[3]

In accordance with the economic development, Mongolian economy has also gone through its financial deepening in monetary and capital markets. The empirical literature has usually described the financial deepening by the ratios of private credit and stock market capitalization to GDP (e.g. Rajan and Zingales, 1998). Figure 1 illustrates the trends in these indicators in Mongolia for 1993-2016. It shows that both indicators have basically increasing trends, and that the development in stock market capitalization is far behind that of private credit by banks, though (Mongolian position of financial deepening among Asian economies will be described in the later section).

Financial deepening and economic growth have a two-way relationship according to a vast body of literature. Financial markets deepen in response to growing demand for financial services as real activities expand. At the same time, financial deepening also contributes to facilitating economic growth. Going back to MacKinnon (1973) and Shaw (1973), for instance, they argued that clearing "financial repression" promotes the mobilization of savings for productive investment use, thereby boosting economic growth. Levine (2005) also demonstrated the significance of the channels through which finance is expected to influence growth: mobilizing and pooling savings, allocating capital to productive investments, etc. There have also been a lot of empirical works to verify the causality from financial depth in stock market as well as banking to economic growth (e.g. King and Levine, 1993; Levine and Zervos, 1998; Levine et al., 2000; Arestis et al 2001; and Beck and Levine 2004).

Mongolian economy, as one of emerging market economies, still stands at the stage where further financial deepening promotes higher growth, in particular, in stock market capitalization that has so far been underdeveloped and has much room to be further developed. What is more important specifically for Mongolian economy is that the development of stock market is indispensable to materialize the long-term financing and investment for its sustainable growth. The current mining-led economy would make it

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[2] The data of real GDP is retrieved by "US Dollars at constant prices (2010) in millions" from UNCTAD STAT: http://unctadstat.unctad.org/EN/.
[3] See the website: https://datahelpdesk.worldbank.org/knowledgebase/articles/906519.

difficult to avoid the "middle income trap" proposed by Gill and Kharas (2007), and might even incur the problem of "Dutch Disease" and "resource curse". Hence comes the urgent necessity to diversify the industries, and it in turn requires long-term investment and financing into sectors other than mining. Then it could be the capital market that would play a significant role to provide long-term financing for non-mining sectors in Mongolia.

It would thus be significant to investigate the impediment factors to prevent stock market capitalization in Mongolia. The determinants of stock market development were illustrated by El-Wassal (2013), in terms of two blocks: the "building block" consisting of supply and demand factors and the "supporting block" of institutional factors and economic policies. The previous studies have examined the underdevelopment of stock market capitalization in Mongolia mainly from the perspective of the shortcomings in supply and demand factors and the drawbacks in the institutional arrangement in the capital market. Danaasuren (2015), for instance, pointed out the following reasons for the immature capital market in Mongolia: weak liquidity of equity on the stock exchange, high concentration of listed companies, no institutional investors like pension funds and a lack of highly-skilled specialists and of financial knowledge among the public and companies.[4]

This article aims to provide the evidence on the relationship between stock market in Mongolia and her macroeconomic policies that El-Wassal (2013) picked up as one of the "supporting block" determinants of stock market development. The key hypothesis is that the recent biases of fiscal and monetary policies in Mongolia would distort her stock-price formation. In the fiscal area, the Government has produced its continuous budget deficits and has accumulated its public debt for this decade. The piles of government securities would, therefore, crowd out the stock trading in the financial market and stagnate the stock prices. As for the monetary policy, the Bank of Mongolia has continued to keep its policy interest rate at higher than ten percent regardless the inflation rate for this decade, caring much about the prevention of currency depreciation and capital outflows, so-called "fear of floating" (see Calvo and Reinhart, 2002). The high interest rates transmitted by the high policy rate would attract much savings to banking sector and government securities market, thereby also stagnating stock market and prices. This study thus examines quantitatively whether the government securities and the high policy rate have

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[4] The structure and history of Mongolian capital market was also well described by Danaasuren (2015).

given negative impacts on stock prices in Mongolia by using a vector-autoregressive (VAR) model.

The rest of the paper is structured as follows. Section 2 identifies Mongolian position of financial deepening among Asian economies, Section 3 conducts the empirical analysis on the relationship between stock market and macroeconomic policies in Mongolia, and Section 4 summarizes and concludes.

2   Financial Deepening of Mongolia among Asian Economies

This section identifies Mongolian position of financial deepening among Asian economies. The financial deepening is expressed by the ratios of private credit and stock market capitalization to GDP as in the introduction. Figure 2 displays the scatter plot between these financial deepening indicators and GDP per capita in 2016 that shows the current development stage of the economies. The scope of "Asia" here is the sum of "East Asia & Pacific" and "South Asia" in the World Bank classification. Regarding the private credit by banks to GDP, the Mongolian position (52.9% at 3,694 US dollars) is almost on the average line of Asian economies along with GDP per capita. As for the stock market capitalization to GDP, however, the Mongolian position (6.2% at 3,694 dollars) is far below the Asian average. Thus the development of Mongolian stock market capitalization appears to be far behind that of Asian average.

Regarding the indicator to measure financial development, Svirydzenka (2016) in the IMF working paper came up with a new indicator by taking into account the complex multidimensional nature of financial development: nine indices to represent financial institutions and financial markets in terms of their depth (size and liquidity of markets), access (ability of individuals to access financial services) and efficiency (ability of institutions to provide financial services at low cost and with sustainable revenues, and the level of activity of capital markets). Mongolian positon in financial development could also be confirmed by this newly-developed indicator. Figure 3 shows that Mongolia (0.335 at 4,385 US dollars) just stands right on the average line of aggregated index along with GDP per capita among Asian economies in 2013.

By using this new indicator, Sahay et al. (2015) in the IMF Staff Discussion Note examined the effect of financial development on economic growth based on a sample of 128 countries over 1980-2013, and found that financial development increases growth,

but the effect weakens at higher level of financial development, and eventually negative, which is bell-shaped relationship with the turning point being around 0.7 of financial development indicator. They speculated the reasons for the bell-shaped relationship by the following logics: too much finance increases the frequency of booms and busts and leaves countries ultimately worse off; too much finance leads to a diversion of talent and human capital away from productive sectors and toward the financial sector; and a very large financial sector is susceptible to moral hazard or rent extraction from other sectors, which leads to a misallocation of resources. Figure 4 indicates that the degree of financial development in Mongolia, 0.335, in terms of the new indicator, is well-below the turning point in 0.7, as in cases of other emerging market economies. Mongolian economy is, therefore, still in a favorable position where further financial development and deepening promote higher growth, namely, growth-enhancing position of financial development. In addition, further financial development in Mongolia would contribute to diversifying her industries and thus sustaining her growth through long-term financing and investment as stated in the introduction.

3   Empirical Analysis

This section conducts the empirical analysis of the relationship between stock market and macroeconomic policies in Mongolia. Since the key hypothesis is that the recent biases of fiscal and monetary policies would distort her stock-price formation, the study examines whether policy variables have given negative impacts on stock prices by using a VAR model. The section starts with clarifying key variables, data and methodology for a VAR estimation, and then discusses the estimation outcomes.

a.   Key Variables and Data

At the beginning, the study identifies the following five variables for a VAR model estimation: stock prices (*stp*), traded values of government securities (*gvs*), central bank's bills rate (*por*), money supply (*mon*) and Gross Domestic Product (GDP) (*gdp*). The sample data are quarterly ones covering the period from the first quarter of 2000 to the fourth quarter of 2017.

The first variable, stock prices (*stp*), is the key variable that is supposed be affected by the policy variables and GDP. Its data are retrieved by the "TOP-20 Index" in period

average from the statistical database of the Bank of Mongolia.[5] Its trend in sample period is shown in Figure 5-1. The second variable, traded values of government securities (*gvs*), represents the fiscal policy condition, and its data are taken by the statistics of Ministry of Finance. As Figure 5-2 indicates, the Government has produced its continuous budget deficits and has accumulated the government securities in terms of GDP share. Danaasuren (2015) demonstrated that the government securities account for 60% whereas companies' stocks hold 40% out of total security trading in 2014. Thus the growing government securities would crowd out the stock trading in the financial market and stagnate the stock prices.

The third and fourth variables, central bank's bills rate (*por*) and money supply (*mon*), are the indicators to represent the monetary policy stance of the Bank of Mongolia. The data of money supply are retrieved by the "M2" from the statistical database of the Bank of Mongolia, and its trend is displayed in terms of GDP-ratio in Figure 5-3. An increase in the money supply, namely, monetary easing is considered to stimulate stock prices through providing liquidities for the stock market. The data of central bank's bills rate, a proxy of policy interest rate, are taken by the weighted average rate of the bills with each period from 3 to 180 days, from the statistical database of the Bank of Mongolia.[6] A rise in the bills rate, namely, monetary tightening weakens stock prices in general. At the same time, from the structural perspective, the sticky, high bills rate, affecting lending and deposit rates, would stagnate stock market and prices, due to the shift of savings from stock market to banking sector and government securities market. Figure 5-4 shows the trend in central bank's bills rate in connection with the trend in inflation rate, and tells us that the Bank of Mongolia has continued to keep its policy interest rate at higher than ten percent regardless the inflation rate for most of this decade. The critical issue is that even after 2015 when the inflation rate has been will-restrained under the targeted rate, the Bank of Mongolia has still kept such a high policy rate. The reason for maintaining a high policy rate in Mongolia comes from the difficulty in balance of payment caused mainly by the sharp decline in inward foreign direct investment and at the same time the difficulty in the fluctuation of local currency value, so-called, "fear of floating".

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[5] See the website: https://www.mongolbank.mn/eng/dbliststatistic.aspx.
[6] The policy interest rate was introduced in July 2007. To cover the sample period, central bank's bills rate is used in this study, since the trend in the policy rate is nearly equal to that in central bank's bills rate.

The last variable, GDP (*gdp*), is included as a control variable in a VAR model estimation, since stock prices would also be affected by the economic condition. Its data are retrieved from National Statistics Office of Mongolia, and processed into seasonally-adjusted time-series data.

As far as the trends in the concerned variables are observed in Figure 5, there seems to be no clear relationship among stock prices, government securities, central bank's bills rate and money supply, since their variables are interacted each other. To verify the hypothesis that policy variables have given negative impacts on stock prices, the variable interactions should be put in a statistical test by applying a VAR model in the next section.

Before conducting the model estimation below, the study investigates the stationary property of the data for each variable, by employing the Ng-Perron unit root test[7] on the null hypothesis that each variable has a unit root in the test equation including "trend and intercept". This test constructs four test statistics: modified forms of Phillips and Perron (1988) statistics (MZa, MZt), the Bhargava (1986) statistic (MSB), and the Point Optimal statistic (MPT). Table 1 reports the test results for the data for all the indicators, i.e., stock prices (*stp*), traded values of government securities (*gvs*), central bank's bills rate (*por*), money supply (*mon*) and GDP (*gdp*) for their level data. The test rejected a unit root in all the data at the conventional level of significance by higher than 95 percent, thereby their data showing stationary property. Their level data are thus justified to be used for the subsequent estimation.

b. Methodology

This subsection clarifies the methodology in the analysis of the relationship between stock market and macroeconomic policies. This study adopts a VAR model since the model allows for potential and highly-likely endogeneity among the aforementioned five key variables, and also for tracing out the dynamic responses of variables to the structural shock of policy variables.

The study now specifies a VAR model equation for estimation in the following way.

$$y_t = \mu + V_1 y_{t-1} + V_2 z_t + \varepsilon_t \qquad (1)$$

where y_t is a column vector of the endogenous variables with year t, i.e., $y_t =$

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[7] Ng and Perron (2001) introduced a new unit root test, which used detrended data and a lag selection procedure that improved on previous methods.

$(por_t \; mon_t \; gvs_t \; stp_t)'$; μ is a constant vector; V_1 and V_2 is a coefficient matrix; y_{t-1} is a vector of the lagged endogenous variables; z_t is a vector of the control variable of GDP (gdp); and ε_{it} is a vector of the random error terms in the system. The lag length (-1) is selected by the Schwarz Information Criterion with maximum lag equal to (-3) under the limited number of observations.

Based on the reduced-form VAR model estimation (1), the study examines the impulse responses of stock prices (stp) to the shocks of policy variables (por, mon and gvs), respectively. In examining the impulse response under the assumption of the contemporaneous interaction between the variables, the structural shock should be identified by imposing some restrictions in the VAR model specification. In general, to identify structural shocks, there are two kinds of approaches to impose the restrictions: short-run restrictions and long-run restrictions. This study employs the Cholesky restriction as one of the short-run restrictions with the following recursive orders: from policy variables (por, mon and gvs) to stock prices (stp), based on the assumption that policy shocks are orthogonal to the other economic variables as in Christiano et al. (1999). By imposing the Cholesky restriction, the error term of reduced-form equation (1) could be linked with the structural shock of the policy variables. The estimated results of the negative response of stock prices (stp) to the shocks of policy variables (por and gvs) imply the distortion of stock-price formation due to the recent bias in fiscal and monetary policies: the cumulative public debt and too high policy rate would stagnate the stock prices.

c. Estimation Outcomes and Interpretation

Table 2, Table 3 and Figure 6 report the estimated outcomes of the VAR model and the impulse responses, respectively.

Regarding the shock of policy rate (por), the stock prices respond negatively to the shock at 90 percent significant level from the 3rd to 5th quarters. As for the shock of government securities, the stock prices also respond negatively to the shock at more than 90 percent significant level from the 1st to the last quarters. On the other hand, the stock prices respond positively to the shock of money supply at 95 percent significant level from the 2nd to the last quarters.

To sum up, the negative responses of the stock prices to the shocks of policy rate and government securities and their positive responses to the money supply shock are identified as are expected in Sub-section 3.1. The first two negative responses imply the

distortion of stock-price formation such that the cumulative public debt and too high policy rate would stagnate the stock prices. These estimation outcomes are basically consistent with the existing evidence even in advanced economies. The negative responses of monetary policy on stock markets such as the fall in stock prices caused by the rise in policy rate were identified, for instance, in Bernanke and Kuttner (2005), Ioannidis and Kontonikas (2008) and Bjørnland and Leitemo (2009). The negative responses of fiscal policy on stock markets such as the drop in stock markets caused by loose fiscal policy were also verified, for instance, in Ardagna (2009), Afonso and Sousa (2012), Agnello and Sousa (2013) and Foresti and Napolitano (2017).

The question then arises on how to relieve the stock market from the recent biases of fiscal and monetary policies in Mongolia. Regarding fiscal policy, the government needs to materialize its budget consolidation plan to mitigate the public debt and to reduce the government securities. As for monetary policy, too high policy rate would reflect the fact that the Mongolian monetary authority has been suffering from a fear of floating: the policy rate has been too sensitive to the balance-of-payment position and the fluctuation of exchange rate. In order to normalize the level of policy rate, the authority should regain its monetary autonomy. Taguchi and Khishigjargal (2018) demonstrated the following policy suggestions to enhance the Mongolian monetary autonomy. First, Mongolian economy should have more foreign reserves to cope with foreign capital mobility. Looking at the total foreign reserves in months of imports in 2016, Mongolian reserves are only two months, which are far below the average months of lower middle incomers, more than six months. That is why the Mongolian monetary authority has to manage its policy rate sensitively against foreign capital flights. Second, from the long-term perspective, Mongolian economy should diversify manufacturing industries to maximize the advantage of currency depreciation in export side and to minimize its disadvantage in import side. Looking at the Mongolian trading items, the exports have concentrated highly on mining products and animal husbandry products, and the imports have concentrated on machinery and consumption goods. Mongolian economy seems to be fragile to the currency depreciation, since the depreciation would bring about inflation through imports but less export gains from mining sectors.

4   Concluding Remarks

Mongolian stock market is underdeveloped compared with its banking credit market, due to a lot of impediment factors to prevent its development. This means Mongolian economy still has much room where its stock market development promotes the long-term financing and investment into non-mining sectors for sustainable economic growth. This paper aimed to provide the evidence on the relationship between stock market and macroeconomic policies in Mongolia under the hypothesis that the recent biases of fiscal and monetary policies would distort her stock-price formation.

The empirical analysis in this study found that the cumulative public debt and too high policy rate have stagnated the stock prices, through identifying the negative impulse responses of stock prices to the shocks of policy rate and government securities under a VAR model estimation. The strategic policy implication for normalizing the stock prices could be the significance in ensuring budget consolidation and in addressing a fear of floating in monetary policy management in Mongolia.

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Appendix

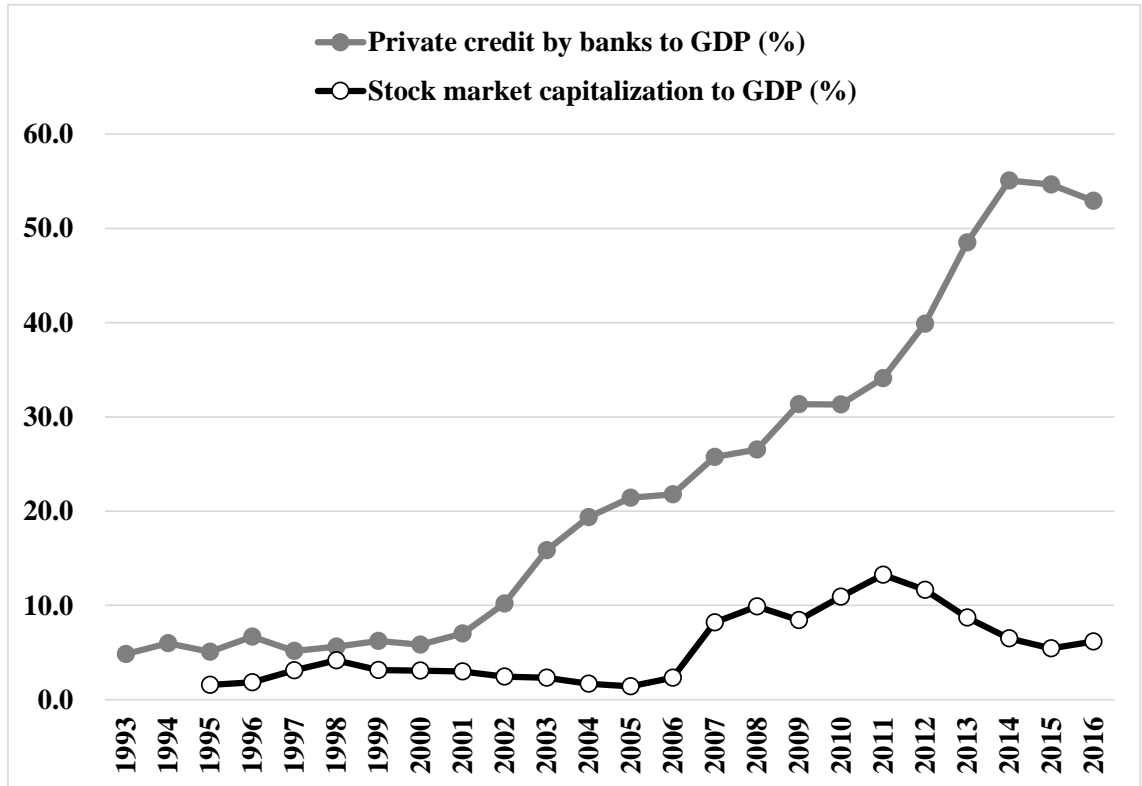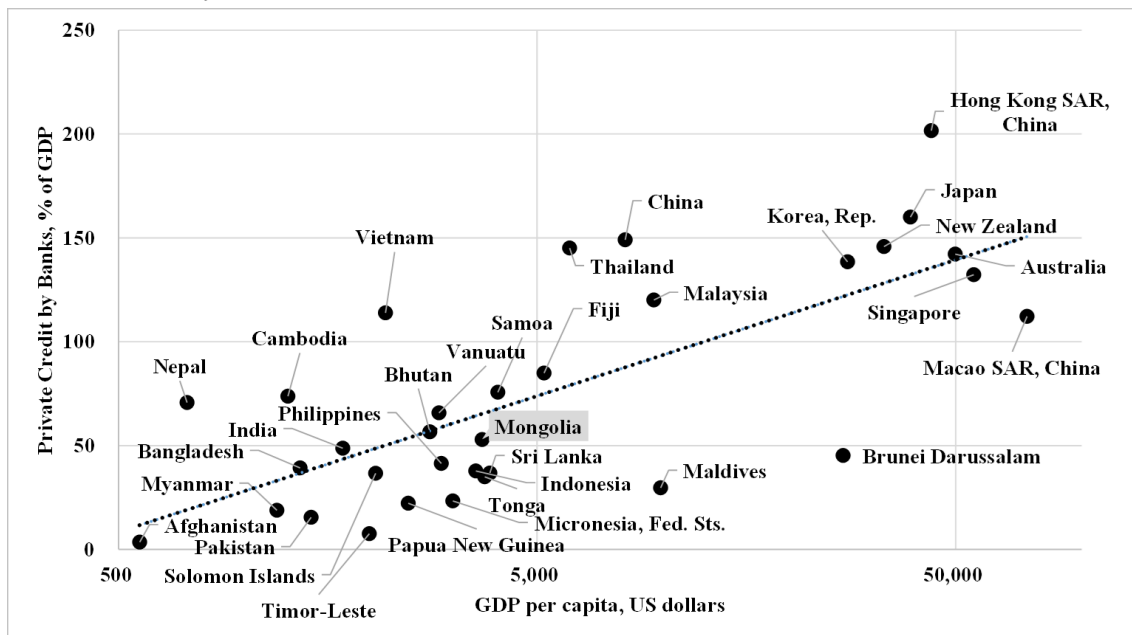Figure 1: Financial Deepening in Mongolia

Source: Global Financial Development Database (July 2018 Version) by the World Bank:
       https://www.worldbank.org/en/publication/gfdr/data/global-financial-development-database.
       The stock market capitalization to GDP for 2013-2016 is based on the statistical database of
       the Bank of Mongolia: https://www.mongolbank.mn/eng/dbliststatistic.aspx.

[Private Credit by Banks]

[Stock Market Capitalization]
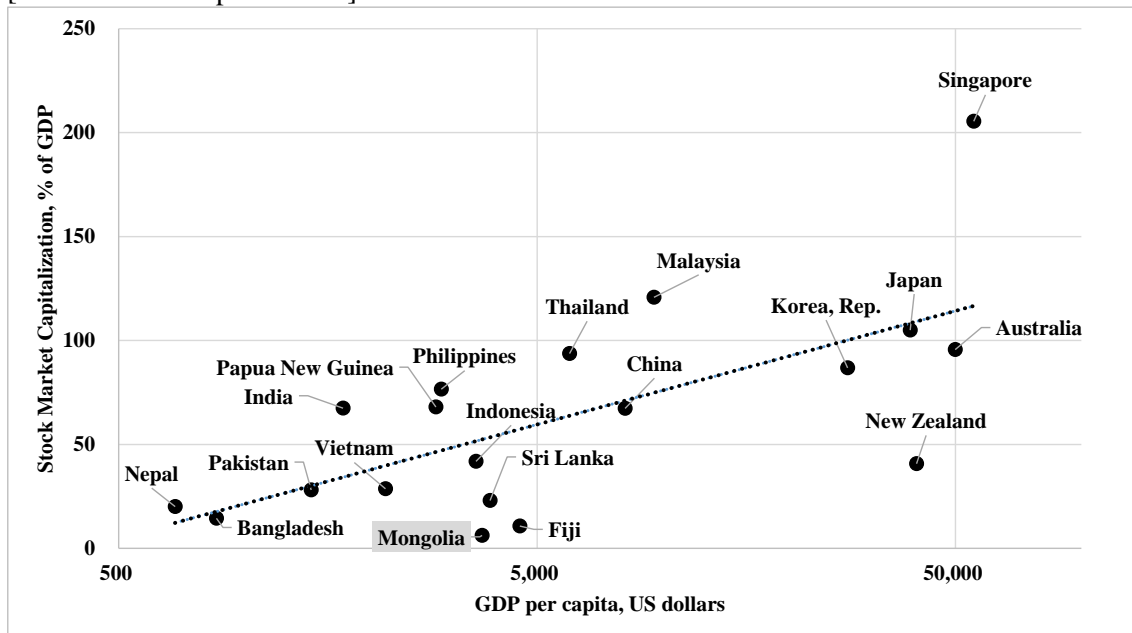
Figure 2: Financial Deepening and GDP per capita in 2016 in Asian Economies

Source: Global Financial Development Database (July 2018 Version) by the World Bank, and the statistical database of the Bank of Mongolia.
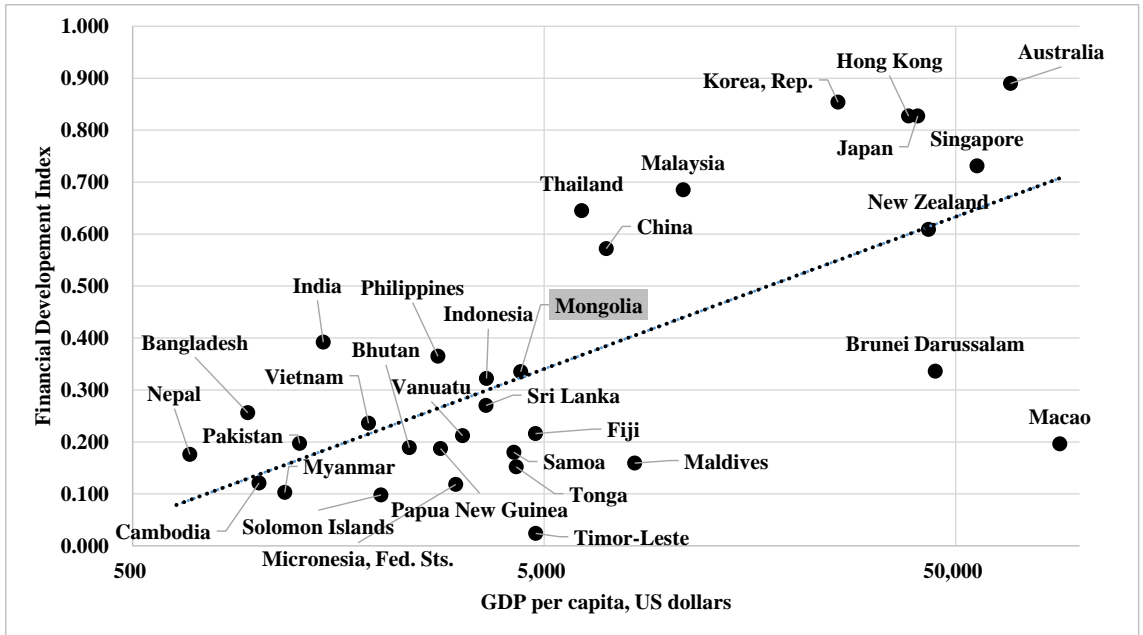
Figure 3: Financial Development and GDP per capita in 2013 in Asian Economies

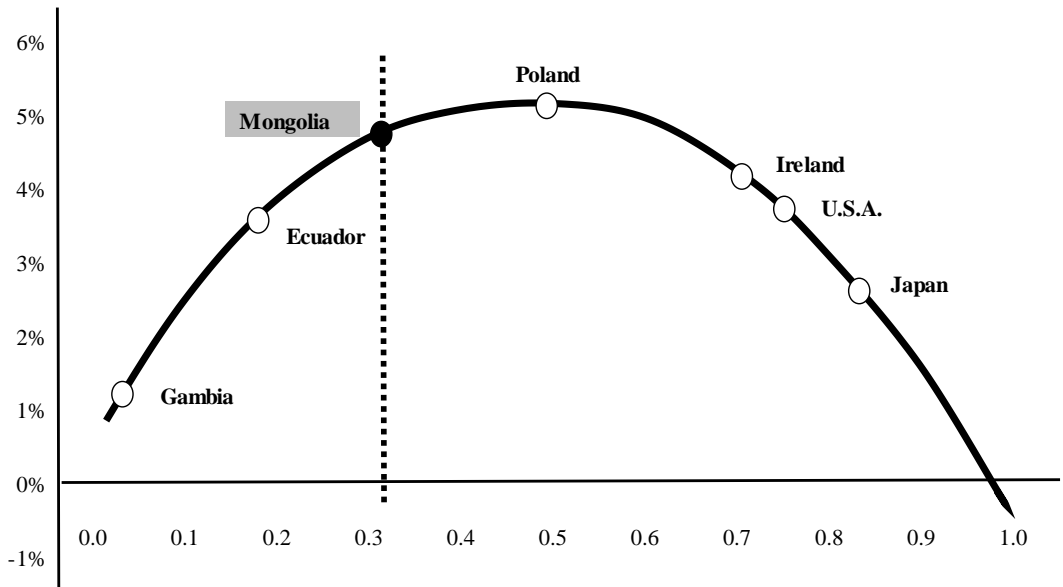Source: Author' description based on Svirydzenka (2016)

Figure 4: Financial Development Effect on Growth

Source: Author' description based on Sahay et al. (2015)

Figure 5: Data Observation of Key Estimation Variables
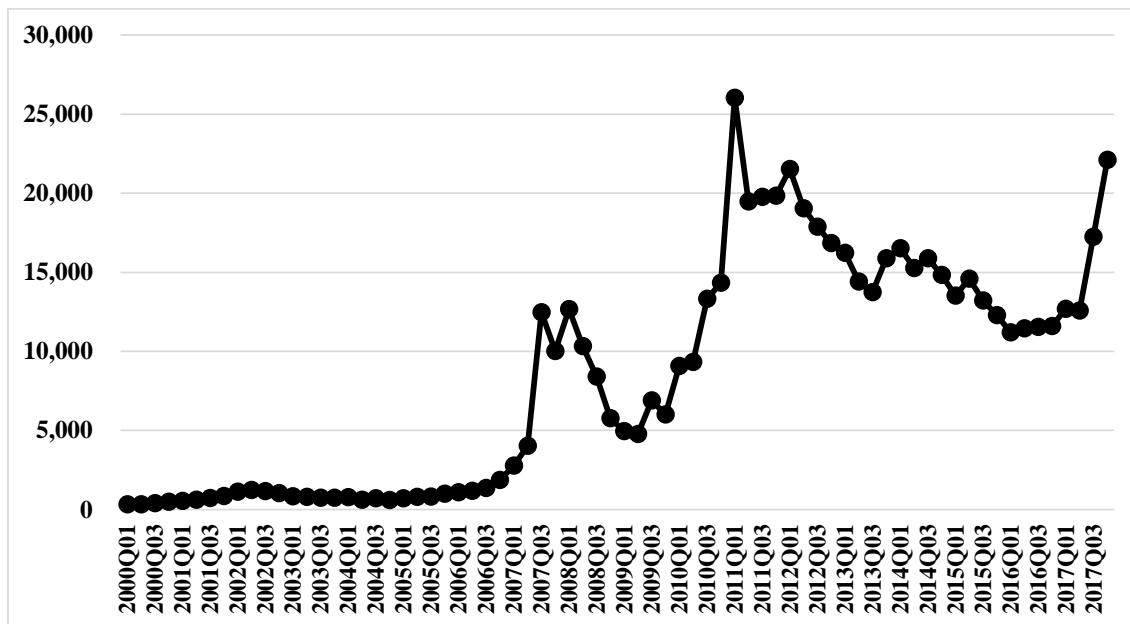
Figure 5-1: Stock Prices: the "TOP-20 Index"
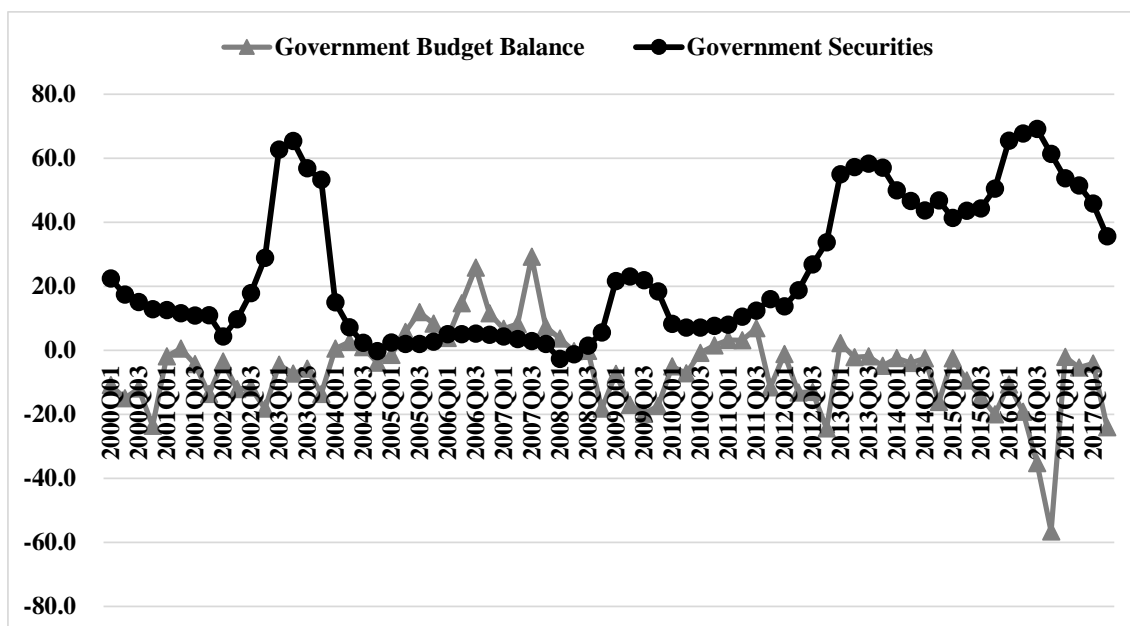
Source: The Bank of Mongolia

Figure 5-2: Fiscal Balance and Government Securities as a percentage of GDP
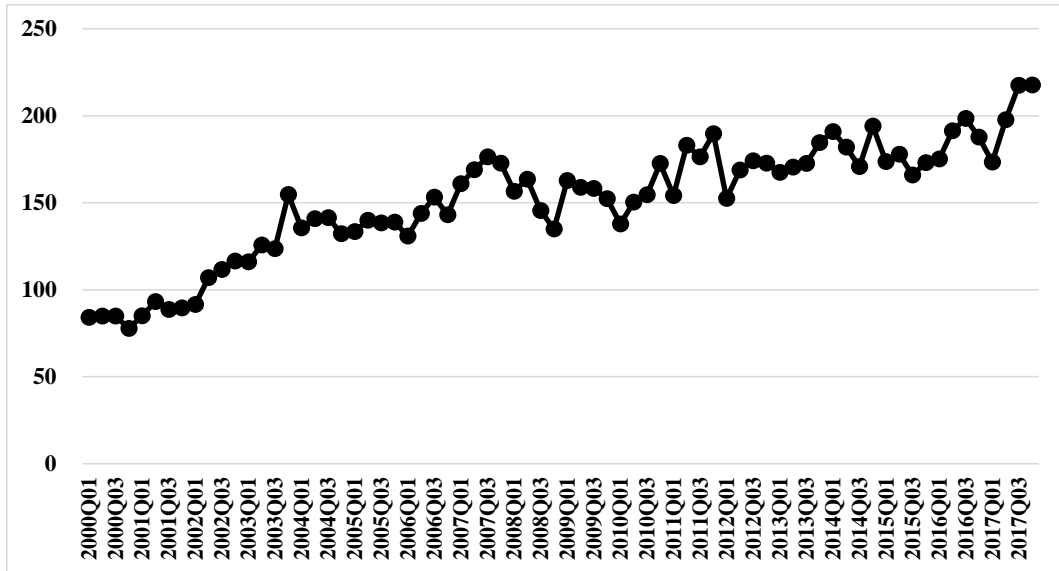
Source: Ministry of Finance

Figure 5-3: Money Supply (M2) as a percentage of GDP
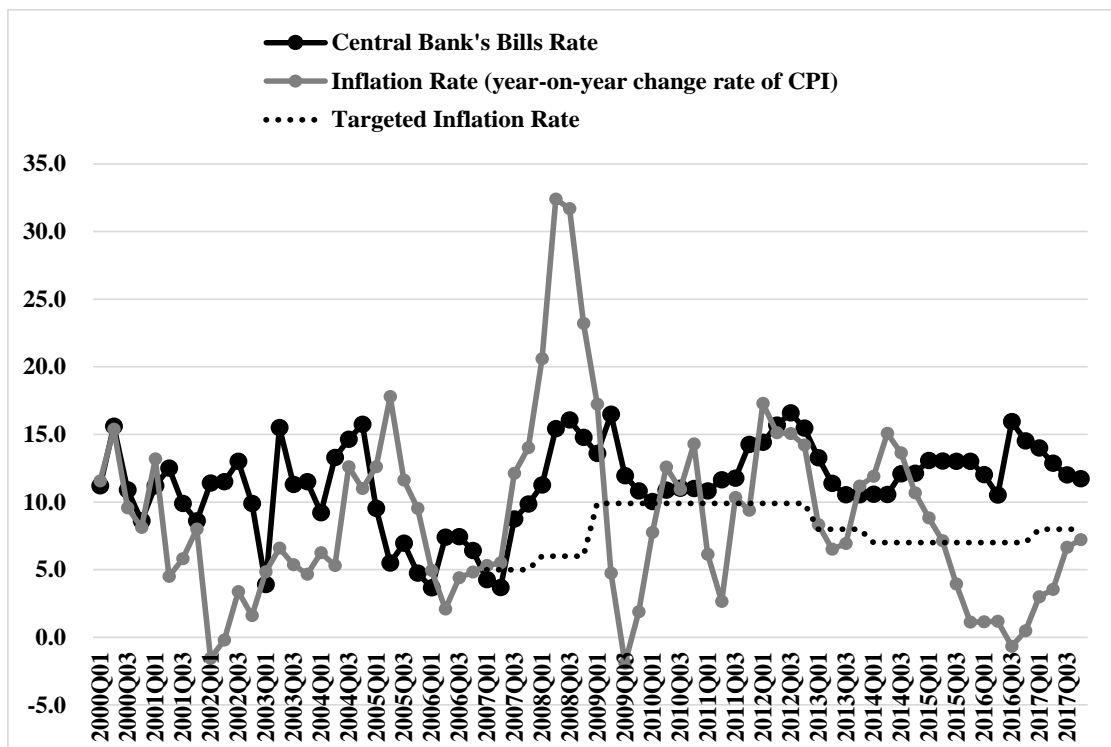
Source: The Bank of Mongolia

Figure 5-4: Central Bank's Bills Rate and Inflation rate (year-on-year rate of CPI)

Note: The targeted inflation rate starts from 2007 since the inflation targeting was introduced in 2007.

Source: The Bank of Mongolia

Table 1: Ng-Perron Unit Root Test

	MZa	MZt	MSB	MPT
stp	-22.32 **	-3.31 **	0.14 **	4.22 **
gvs	-45.55 ***	-4.77 ***	0.10 ***	2.00 ***
por	-22.48 **	-3.35 **	0.14 **	4.06 **
mon	-41.87 ***	-4.41 ***	0.10 ***	3.03 ***
gdp	-18.62 **	-2.96 **	0.15 **	5.39 **

Source: Author's estimation

Table 2: Estimated VAR Model

	por	*mon*	*gvs*	*stp*
por $_{-1}$	$5.55*10^{-1}$ *** [5.67]	$-1.79*10^{4}$ [-1.37]	$1.02*10^{4}$ [1.36]	$-1.45*10^{2}$ * [-1.72]
mon $_{-1}$	$6.43*10^{-7}$ [0.92]	$9.84*10^{-1}$ *** [10.61]	$-1.76*10^{-1}$ *** [-3.30]	$5.09*10^{-4}$ [0.84]
gvs $_{-1}$	$8.39*10^{-7}$ [0.93]	$1.78*10^{-1}$ [1.49]	1.05 *** [15.32]	$-2.91*10^{-3}$ *** [-3.76]
stp $_{-1}$	$2.37*10^{-4}$ ** [2.17]	$2.27*10^{1}$ [1.57]	$1.00*10$ [1.20]	$6.28*10^{-1}$ *** [6.68]
const.	4.87 *** [4.26]	$2.42*10^{5}$ [1.59]	$-1.59*10^{5}$ * [-1.81]	$1.09*10^{3}$ [1.10]
gdp	$-2.03*10^{-6}$ [-1.41]	$-3.98*10^{-2}$ [-0.20]	$2.71*10^{-1}$ ** [2.47]	$1.67*10^{-3}$ [1.35]
adj. R^2	0.42	0.99	0.98	0.91
Sample size	71 (from 2002Q2 to 2017Q4)			

Note: ***, **, * denote rejection of null hypothesis at the 99%, 95% and 90% level of significance, respectively. The figure in [ ] are t-value.
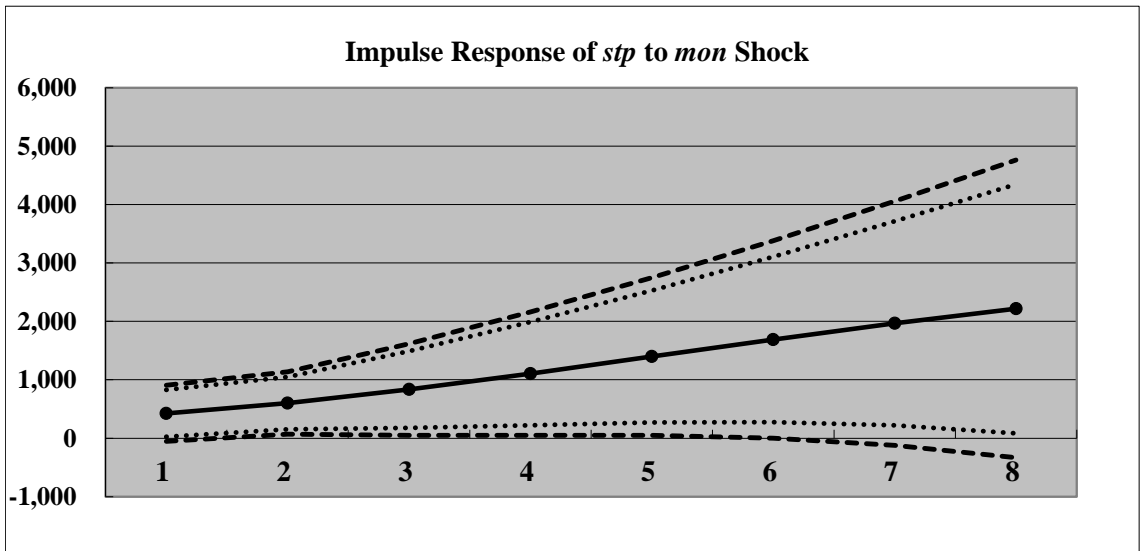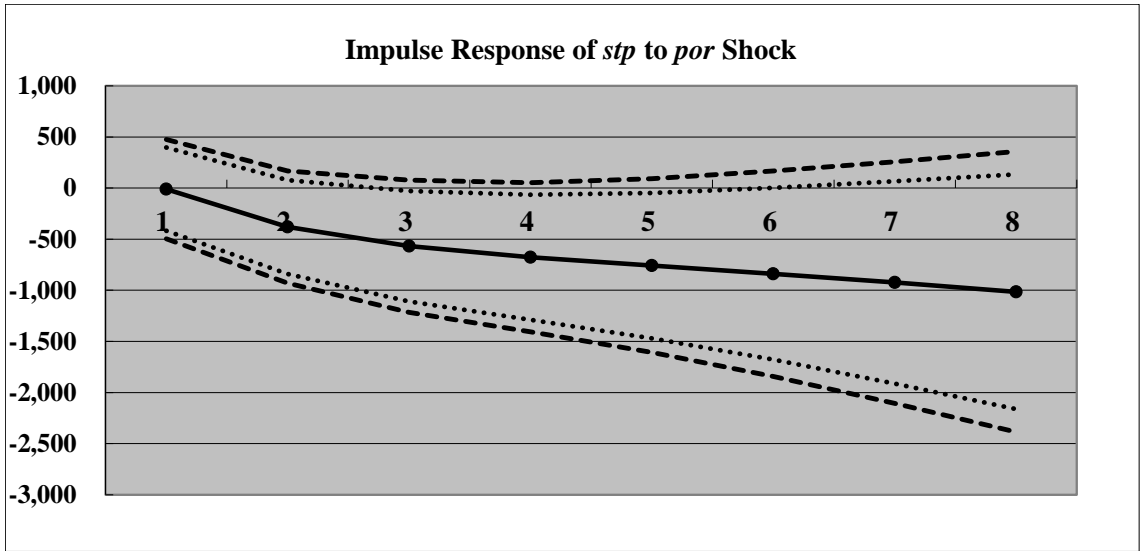Source: Author's estimation

Table 3: Impulse Responses of Stock Prices (*stp*) to Policy Variables' Shocks

	Shock from *por*	Shock from *mon*	Shock from *gvs*
Q1	-11.0 (248.1)	425.5 * (245.5)	-320.6 (241.4)
Q2	-380.5 (279.8)	602.4 ** (273.4)	-714.6 ** (199.1)
Q3	-568.9 * (329.9)	834.2 ** (400.1)	-979.4 ** (215.4)
Q4	-676.9 * (372.5)	1,106.1 ** (538.5)	-1,131.9 ** (251.1)
Q5	-758.4 * (433.4)	1,398.0 ** (688.8)	-1,194.7 ** (297.8)
Q6	-838.0 (512.8)	1,690.5 ** (862.3)	-1,190.4 ** (354.5)
Q7	-923.6 (603.1)	1,967.1 * (1,065.5)	-1,138.2 ** (420.3)
Q8	-1,014.4 (700.3)	2,215.7 * (1,299.2)	-1,054.0 ** (493.2)

Note: **, * denote rejection of null hypothesis at the 95% and 90% level of significance.
Source: Author's estimation

Impulse Response of *stp* to *por* Shock

Impulse Response of *stp* to *mon* Shock

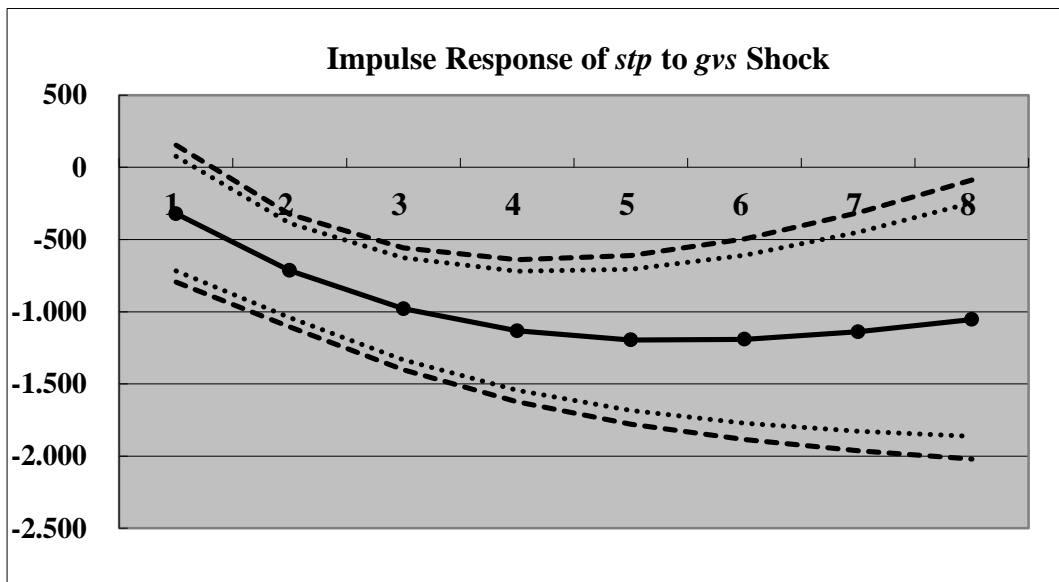**Impulse Response of *stp* to *gvs* Shock**

Figure 6: Impulse Responses of Stock Prices (stp) to Policy Variables' Shocks
Note: The fine and coarse dotted lines denote a 90 and 95 percent error band over 8-quarter horizons.
Source: Author's estimation