MEASURING SUDDEN STOPS IN MONGOLIA

Dulamzaya Batjargal[1], Gan-Ochir Doojav[2]

JEL ангилал:	Хураангуй:
F30, F32	In this paper we empirically examine the sudden stops in capital flows in Mongolia based on Calvo et al. (2004) approach in the past two decades. We found 5 episodes of sudden stops in capital flows and 5 episodes of sudden stops in domestic credits since 1998. Domestic sudden stops lasted longer than the external sudden stop and, in most cases, external sudden stops are followed by the domestic sudden stops. The common consequences of sudden stops on the economy are reduced investments, slack in credits, economic slowdown, the exchange rate depreciation, decline in reserves, and banking crisis/difficulties.
Түлхүүр үг:	
Motivation, Compensation, Monetary reward, Human resource management, Individual performance	

1. Introduction

A term "sudden stop" (SS) was first introduced by Dornbusch et al. (1995). It is an event characterized by an abrupt and large fall in capital inflows (or net flows) into the economy. Sudden stops have both financial and real effects on an economy. In the event of a sudden stop, the exchange rate depreciates, reserves decline, and equity prices fall. GDP growth then decelerates, investment slows, and the current account strengthens. Calvo et al. (2004), analyzing the empirical characteristics of sudden stops in capital flows in a sample of 32 countries, find that emerging markets are vulnerable to large RER fluctuations because they could be forced to large adjustments in the absorption of tradable goods, and/or because the size of dollar liabilities in the banking system is high. Calvo et al. (2008) analyze the characteristics of systemic sudden stops (sudden stop + sharp rise in interest spread) in capital flows in a sample of 110 countries. They find that a small supply of tradable goods relative to their domestic absorption and large foreign-exchange denominated debts towards the domestic banking system are claimed to be key determinants of the probability of systemic sudden stops.

Sudden stops can be triggered by external, domestic, and financial factors. Comelli (2015), identifying episodes of sudden stops in emerging economies, finds that sudden stops are more likely when global growth falters, risk aversion in financial

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markets rises, and vulnerabilities in the external and financial sectors increase. The significance of the explanatory variables varies across regions. In Asia, financial linkages tend to be more important than trade linkages and gross capital flows are less responsive to global growth than it is in Latin America or Eastern Europe. Li et al (2019), examining the covariates of sudden stops in fund equity and bond flows in 65 economies, find that for sudden stops in equity flows, global factors play a more important role in high-income economies while sudden stops in bond flows, global variables are the most important covariates in emerging economies, and domestic variables play a more important role in high-income economies.

A sudden stop may also be accompanied by a currency crisis or a banking crisis or both. Calvo (1998) studies mechanisms through which a sudden stop in international credit flows may bring financial and balance of payments crises. It is shown that these crises can occur even though the current account deficit is fully financed by foreign direct investment. On the other hand, equity and long-term bond financing may shield the economy from sudden stop crises.

Nevertheless, **depending on the types of capital flows, not every sudden stop is disruptive to the economy.** Cavallo et al. (2015) proposed a new taxonomy of sudden stop, analyzing sudden stops in 7 different categories of gross and net flows. They find that most significant currency depreciations occur in cases of sudden stop occurred in all of capital inflows, capital outflows, and net capital flows based on empirical studies of advanced and developing economies. The sudden stops in net flows associated with reductions in Gross Inflows are more disruptive than those where surges in (only) Gross Outflows dominate. Moreover, Sudden Stops in Gross Inflows that do not provoke a sharp contraction in Net Flows may also be disruptive, including Sudden Stops that are driven by "other flows"—which include banking flows.

The effects of sudden stops can be offset only partially by stronger macroeconomic and financial positions. Eichengreen and Gupta (2016), analyzing the sudden stops in capital flows to emerging markets, find that while the frequency and duration of sudden stops have remained largely unchanged, the relative importance of different factors in their incidence has changed. Global factors appear to have become more important relative to country-specific characteristics and policies. Stronger macroeconomic and financial frameworks have allowed policymakers to respond more flexibly, but these more flexible responses have not guaranteed insulation or mitigated the impact of the phenomenon. Calvo and Reinhart (2000) study policies, such as capital controls and dollarization, that could reduce the incidence of crises, or at least make the sudden stop problem less severe. They find that while capital controls appear to influence the composition of the flows away from short term maturities it is not a long-term solution for capital reversals. On the other hand, dollarization appears to have the side to ameliorate the sudden stop problem.

This paper empirically examines the cases of sudden stops in the Mongolian economy for gross capital flows, for domestic credits, and for different components of capital flows, and tries to explain the cases in line with the respective economic situations. We also analyze if the sudden stops occurred together with large exchange rate depreciation in Mongolian economy and whether there was a case of "fear of floating" as suggested by Calvo and Reinhart (2002).

The remainder of the paper is structured as follows: 2. Methodology, 3. Sudden stop estimates for Mongolian economy, and 4. Conclusion.

Methodology

As employed by Calvo et al. (1998, 2004), a sudden stop is said to occur when the year-on-year **change in capital flows** over four quarters **is at least one standard deviation below the average** of previous five years and **when in at least one-quarter flows are two standard deviations below** that prior average. Episodes lasting only one quarter are discarded.

SS signal:

- y-o-y capital flows < (mean of y-o-y capital flows – 2*std of y-o-y capital flows)
- SS interval:
- Start: At the date capital inflows falls below one standard deviation below the mean before the SS signal
- End: At the date capital inflows goes back above one standard deviation above the mean after the SS signal

In this approach, the capital flows to calculate external sudden stops are defined as a change in gross foreign reserves excluding the change in the trade balance, since we do not have a good track record of capital flows, all the flows except the trade balance as capital flow. The domestic flows are defined as a change in domestic credits issued by depository corporations of Mongolia.

For External SS: Capital flows $= \Delta(\text{Gross foreign reserves} - (\text{Exports} - \text{Imports}))$

For Domestic SS: Domestic flows $= \Delta$ in domestic credits issued by depository corporations

Afterwards, we also analyze the occurrences of sudden stops in both or all of capital inflows, outflows, and net flows as suggested by Cavallo et al. (2015) based on the components of balance of payments of Mongolia, employing the same methodology above.
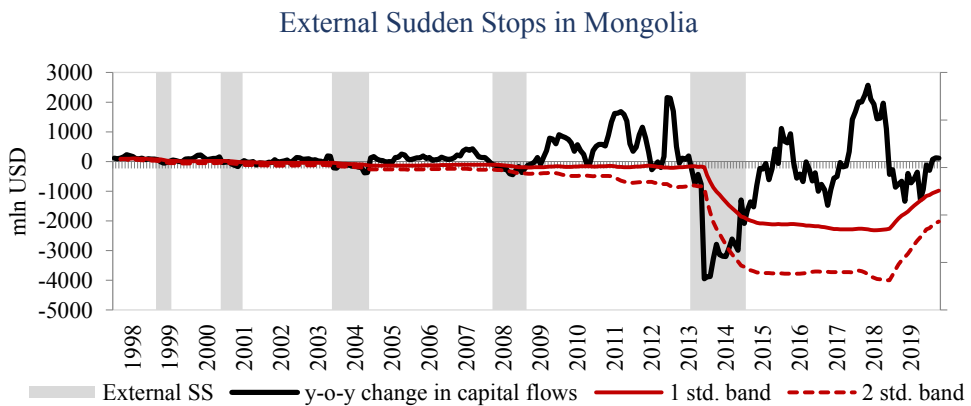
2. Sudden stops in Mongolia

In this section, the episodes of sudden stops in Mongolia between 1998 and 2019 is assessed, based on a monthly database of gross foreign reserves, the components of balance of payments and domestic credits using the definition of a sudden stop

discussed in Section 2.

2.1. Sudden Stop estimate: Calvo et al. (1998, 2004) approach

The Mongolian economy appears to have experienced 5 external sudden stops in the period of 1998-2019[3] (Figure 1) according to sudden stop definition in Section 2. The sudden stops in 1999 and 2008-09 are the result of spillover effects, from the Asian financial crisis and the global financial crisis, transmitted through the economy mainly via loss of investors' confidence and foreign trade channel. The banking crisis in Mongolia as a result of bankruptcy of 2 banks in 1996-97 and liquidation of 2 banks and restructuring of 1 bank in 1998-99 along with Asian financial crisis have played major role to scare investors away and cause external sudden stops. The foreign direct investments contracted by 24 percent and export revenues dropped by 19 percent in 1998 and other investments contracted by two third in 1999. As for the sudden stop in 2008-09, the economy was overheating rapidly before global financial crisis and when the crisis hit the economy together with price decline in the global commodity market, export revenues declined by 25 percent, foreign direct investments, that were mostly in the mining sector, fell by 32 percent, and other investments declined by 65 percent primarily driven by sharp drop in long-term external lending and local residents and banks taking their foreign currency and deposits abroad. Two systemically important banks were bankrupted in 2008-09, exchange rate depreciated by 23 percent and the economy, with historical average growth of 7 percent, contracted by 1.3 percent in 2009. A sudden stop in 2004-2005 is associated with the government debt repayment, amounting 300 million USD, to the Russian government, as well as the halting of Chinese FDIs on Mongolia's light industries. In particular, other investments flow shrunk by half with the large debt repayment and foreign direct investments declined by 29 percent in 2004.

Figure 1

External Sudden Stops in Mongolia

3   The earliest available monthly data series starts from 1997.

*In the figure, the external sudden stop is measured as sudden stop in capital flows defined in Section 2.

Up until 2010, Mongolia's external investment position was not as large compared to recent years, therefore, the magnitudes of earlier 4 sudden stops were small, and the lengths were less than 12 months. The largest and most recent sudden stop occurred in 2013-14, that lasted for 18 months. The capital flows fell sharply in August 2013 mainly due to FDI sudden stop in Oyu Tolgoi mining project. After completion of the first Oyu Tolgoi project of open pit mine, which amounted 24 and 17 percent of GDP in 2011 and 2012, respectively, the second project was delayed due to political instability and mining policy uncertainty. In particular, the foreign direct investments contracted by 52 percent (or by 17 percent of GDP) in 2013 and by 89 percent (or 15 percent of GDP) in 2014. On top, the commodity super cycle ended by that time. The export revenue declined by 19 percent in 2015 where non-copper exports fell by 25 percent[4]. These two factors led to sudden fall in capital inflows, slowdown in economic growth (from 11.6 percent in 2012 down to 7.9 percent in 2013 and 2.4 percent in 2015). While the exchange rate depreciation was not sharp (8 percent in 2014 and 9 percent in 2015), net international reserves declined drastically by 1.0 billion USD in 2014 and 0.7 billion USD in 2015 and gross international reserves shrank by 40 percent to 1.3 billion USD in 2 years.

Figure 2

Domestic Sudden Stops in Mongolia

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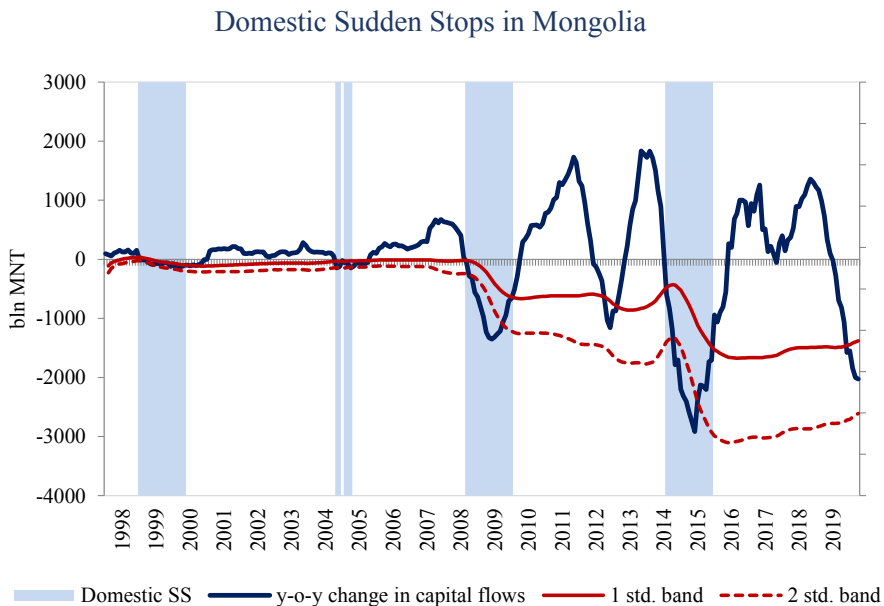
[4] Copper revenues boosted in 2013-2014 due to start of copper concentrate production of Oyu Tolgoi open pit mine.

The domestic sudden stops were calculated for the y-o-y change in domestic credits issued by depository corporations as discussed in Section 2. Figure 2 suggests 5 episodes of domestic sudden stops in Mongolia over the past two decades. The sudden stop in 1999-2000 was related to the external sudden stop mentioned above, credit crunch and banking crisis in the economy. The total loan outstanding shrunk by 9 percent in 1999 and 14 percent in 2000. Nonperforming loan to total loan was increased from 20 percent in 1998 to 31 percent in 1999 and 51 percent in 2000.

The domestic credit sudden stop in 2008-09, continued for 17 months, was related to sudden stop in capital flows due to the global financial crisis and bankruptcies of two systemically important banks, namely Anod, Zoos. The issuance of new loans declined by 30 percent in 2009 year-over-year, indicating a credit crunch in the economy. As a result of the bankruptcies, a share of nonperforming loans in total loans increased from 7.2 percent in 2008 to 17.4 percent in 2009.

The recent and the largest ever external sudden stop (shrunk of capital inflow) preceded the domestic sudden stop (that lasted for 17 months) in 2014-15. The capital flows fell sharply mainly due to FDI sudden stop and a fall in commodity prices. These unfavorable conditions worsened the mining sector performance, increasing the nonperforming loan of mining, manufacturing, and trade sectors[5]. The banks came to be more cautious and reluctant to lend, at the same time the central bank stopped its liquidity injection that has backed the money market for two years, consequently, the credit crunch happened. The newly issued loans declined by 18 percent year-over-year in 2015. Given the lack of capital inflows and domestic credits, the economy fell into recession (the economic growth fell from 7.9 percent in 2014 to 2.4 percent in 2015 and 1.2 percent in 2016), extending the duration of the credit crunch further.

In the first 4 months of 2020, the annual change in domestic credit has fallen below 1 standard deviation band. This is mainly due to the one-time government measure of relieving pension loan repayments and decline in an outstanding amount of consumer loan by 18.5 percent or approximately 1 trillion MNT. Nevertheless, domestic credit growth has decelerated significantly due to the spread of COVID-19 and weakening external and domestic economy, the economy might face domestic sudden stop in coming months.

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[5] Nonperforming loans increased by 32 percent in 2015 where 14 percentage points were in nonperforming loans in mining, 7 percentage points were in manufacturing, 5 percentage points were in trade sector.

Figure 3

External and Domestic Sudden Stops in Mongolia


■ Domestic SS   ■ External SS
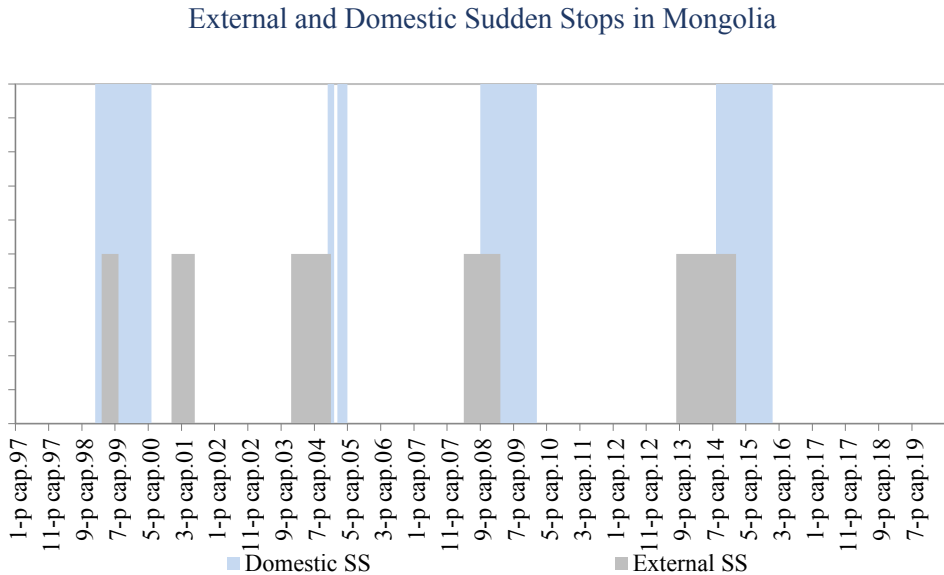
The episodes of domestic and external sudden stops of Mongolia reveal that in half the cases, the external sudden stops were channeled to the domestic sudden stops with a lag of several months. As Mongolia is a small open economy, the external shocks have a strong and contagious impact on the domestic financial system and the domestic market. The length of domestic sudden stops mainly lasted longer than the external sudden stops (Figure 3).

2.2. Sudden stop estimate: Cavallo et al. (2015) approach

In this session, we examine cases of sudden stops in capital inflows, outflows, and net flows separately, then assess whether those sudden stops overlap with one another using quarterly balance of payments data of Mongolia.

Figure 4

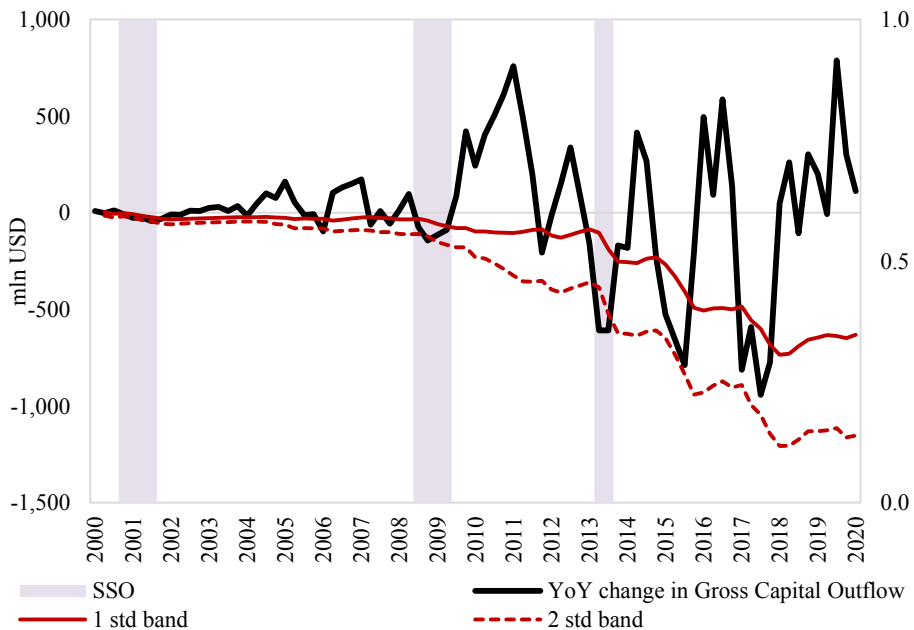Sudden stops in Gross Capital Inflows (SSI)
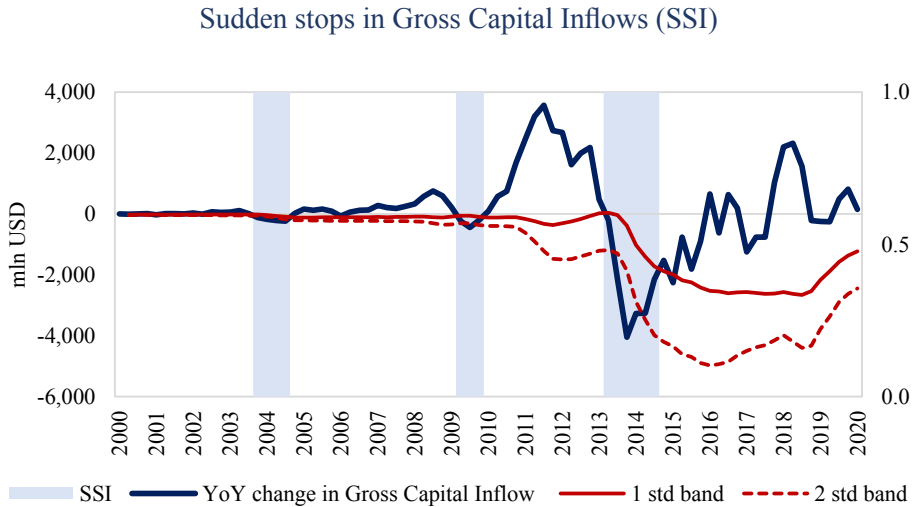
*where Gross capital inflows are defined as net purchases of domestic assets by foreign residents. In other words, liabilities of the financial account in the balance of payments.

The size of capital inflows to and outflows from Mongolia were small before 2008. The gross capital inflow increased significantly in 2010-13 and 2018-19 due to the development of the Oyu Tolgoi mining project (Figure 4). A sudden stop in gross capital inflows represents that the foreign residents are not investing in the Mongolian economy and even pulling out their shares of investment from Mongolia. In this approach, we find 3 cases (2003-04, 2009, 2013-14) of sudden stops in the gross capital inflows in the past two decades. The sudden stops lasted 4, 3, and 6 quarters in respective episodes. The volatility in gross capital inflow has increased between 2010-2015 because of huge FDI in Oyu Tolgoi project and its sudden stop, then narrowed in recent years (Figure 4).

Figure 5

Sudden stops in Gross Capital Outflows (SSO)

*where Gross capital outflows are defined as net purchases of foreign assets by domestic residents. In other words, assets of the financial account in the balance of payments.

A sudden stop in gross capital outflow indicates the domestic residents are investing abroad rather than in the domestic economy. In the case of the gross capital outflow, we observed again 3 sudden stops (SSO) in 2000-01, 2008-09, and in 2013 (Figure 5). While SSO in 2008-09 occurred three quarters earlier than SSI in 2009, SSO in 2013 occurred in the same quarter as in SSI. The variance of gross capital outflow is 3 times smaller than the variance of gross capital inflow. While the volatility in capital inflow has narrowed in past years, the volatility in capital outflow remains high.

Sudden stops in Net Capital flows (SSN)
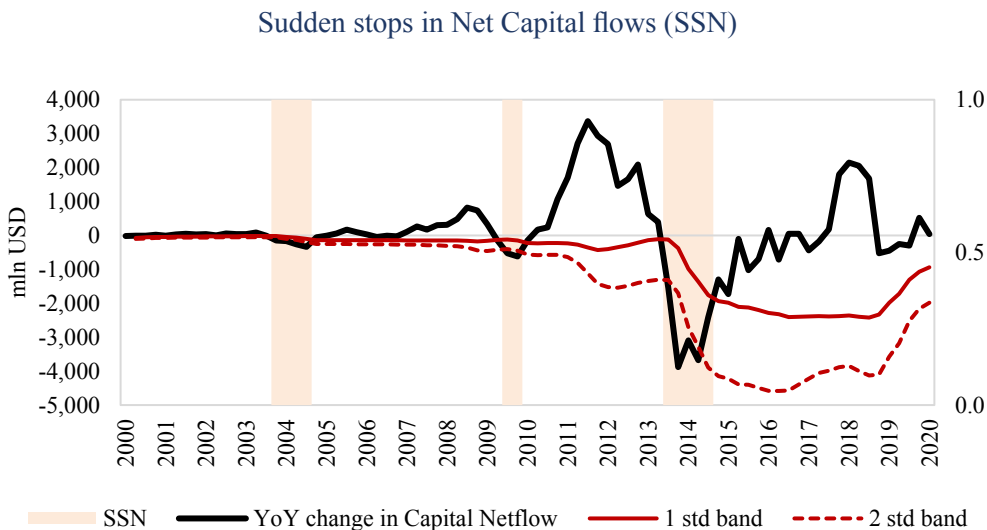
*where Net Capital Flows = (Gross Capital Inflows - Gross Capital Outflows) or defined as the financial account in the balance of payments.

Since gross capital outflow has been relatively small in case of Mongolia, net capital flow follows the shape of capital inflows. Three episodes of SSN observed in 2003-04, 2009, and 2013-14, which lasted for 4, 2, and 5 quarters respectively. All 3 episodes of sudden stops observed in capital inflow (SSI) are captured in the sudden stop analysis of net flows (SSN) (Figure 6).

Overall, there is only one case of sudden stop occurrence in all gross capital inflows, outflows and net flows happened, which is in 2013Q3 (Table 1).

Table 1

Sudden Stops in capital inflows, outflows, and net flow

	SSIO	SSIN	SSON	SSION
Episodes of SS	Twice	Three times	Once	Once
Length of SS	2 quarters	11 quarters	1 quarter	1 quarter
Date of SS	2009Q2, 2013Q3	2003Q4-2004Q3, 2009Q2-Q3, 2013Q3-2014Q3	2013Q3	2013Q3

We also apply the same concept for y-o-y change in the current account balance (Figure X.3). The estimate shows that Mongolia appears to have confronted 4 sudden stop episodes in current account balance over the last two decades. The first two cases were relatively short-lived (2 quarters in 2000 and 3 quarters in 2002-03) and small in terms of size. The latter two, in 2008-09 due to the global financial crisis overlapping

with the external sudden stop in capital flows (as analyzed in Section 3.1), and in 2010-12 due to the increased imports of the largest mining project Oyu Tolgoi, lasted up to 7-8 quarters. The volatility in the current account balance expanded until 2016 and narrowed in 2017-2018 and has broadened again in 2019 (Figure X.1).

2.3. Sudden stops and exchange rate volatility

In this part, we examine the relationship between external sudden stops and exchange rate volatility based on the idea of "fear of floating" defined by Calvo & Reinhart (2002). The nominal togrog rate did not have much volatility before 2008, except for the cases of Asian financial crisis in 1997 and Russian crisis in 1999-2000. The exchange rate regime was announced as managed floating during 2000-08, yet the Bank of Mongolia intervened a lot in the foreign exchange market to stabilize the currency. As the global financial crisis hit the economy in 2008, with the mounting exchange rate depreciation pressure, Central bank used up two third of its foreign reserves to protect the currency and net international reserves fell below zero, it had to let the currency float in 2009. As a result, the local currency, togrog, overshoot by 35 percent within 4 months period. For this reason, the exchange rate depreciation occurred after few months than the external sudden stop with lagged effect. Since then, the exchange rate intervention is somewhat reduced. Due to the intervention of BoM in the market, the external sudden stops did not occur with the exchange rate volatility as expected. Recent sudden stop (2013-15), however, has overlapped with the large exchange rate volatility.

Figure 7

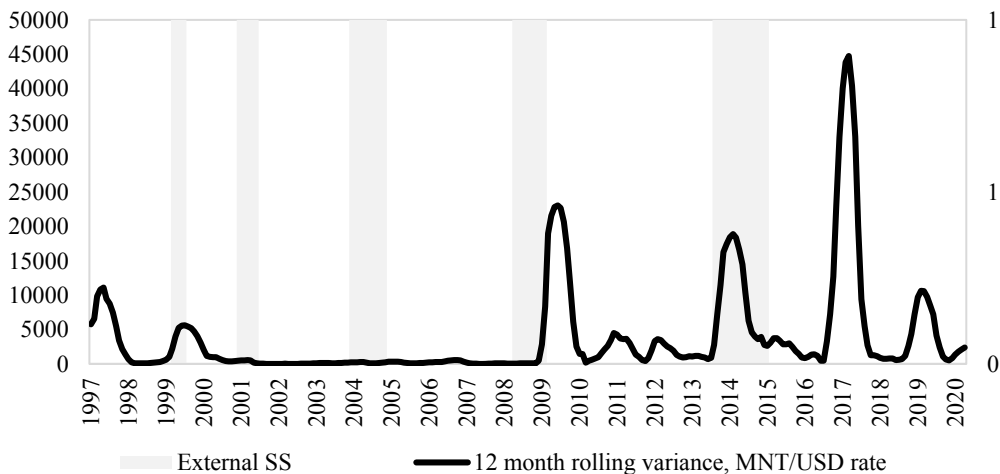External sudden stop and exchange rate volatility

Table 2

Exchange rate variability and SS

Sudden Stops	Duration (in months)	Variance during SS	Variance before SS	Variance after SS
1999.03 - 1999.07	5	**375**	696	566
2000.12 - 2001.06	7	**6**	615	3
2003.12 - 2004.11	12	**248**	199	153
2008.04 - 2009.02	11	**9050**	55	1581
2013.08 - 2015.01	18	**8851**	2056	1114

Table 2 shows the exchange rate variances during, before and after the sudden stops. The length of the period to calculate the variances before and after the SS are as same as the duration of each sudden stops. The exchange rate variance during the SS was smaller than the variance before or after the SS in first two cases (1999 and 2000). But in last three cases (2004, 2008-09, 2013-15) of sudden stops, the exchange rate variance during the SS was much larger than the variance before or after.

3. Conclusion

In this paper, we examined the episodes of sudden stops, large and abrupt fall in capital flows, in the Mongolian economy. We found that there were 5 episodes of an external sudden stop and 5 episodes of domestic sudden stops since 1998, based on Calvo et al. (2004) approach. Domestic sudden stops lasted longer than the external sudden stop and often external sudden stops preceded the domestic sudden stops. The common consequence of sudden stops on the economy are lowered investments and credits, economic slowdown/recession (mainly in last two cases), some improvement (reversal from the lowest point) in current accounts, exchange rate depreciation (either during or after the sudden stop), decline in reserves, and banking crisis (during the Asian and global financial crisis).

Looking at capital inflow, outflow, and net flows, we found 3 episodes of sudden stops for each capital inflow, outflow, and net flows in Mongolia. There was only one case in 2013 where a sudden stop occurred in all the capital inflow, outflow, and net flows. Capital flows declined due to FDI sudden stop in Oyu Tolgoi mining project and commodity price fall and it caused a large depreciation in the local currency.

The study can be further developed by analyzing empirically the aftermath impact of sudden stop in the economy based on the sudden stop episodes identified in this paper.

References

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Data Sources

Bank of Mongolia - https://mongolbank.mn/eng/liststatistic.aspx

IMF database: BOP/IIP statistics - http://data.imf.org

FRED database - https://fred.stlouisfed.org

APPENDIX
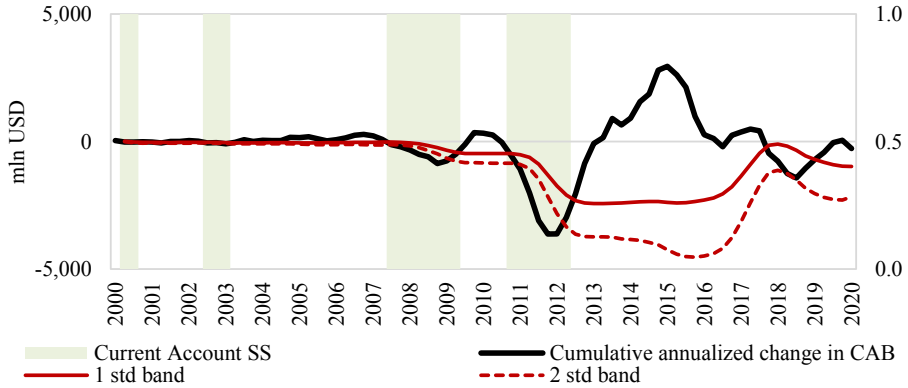
Figure X.1. Sudden stops in Current Account Balance
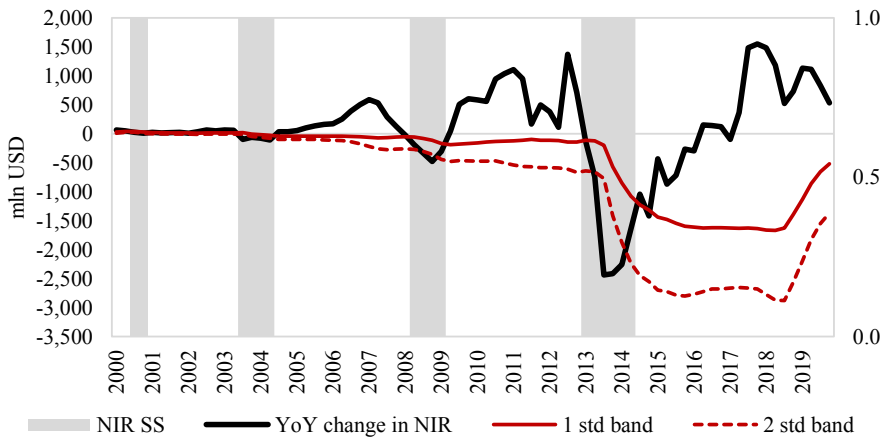

Figure X.2. Sudden stops in Net International Flows

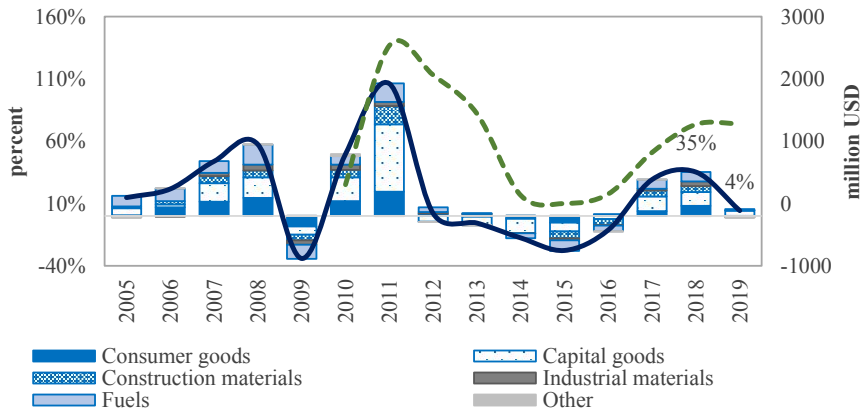Figure X.3. Growth in Imports and Oyu Tolgoi FDI
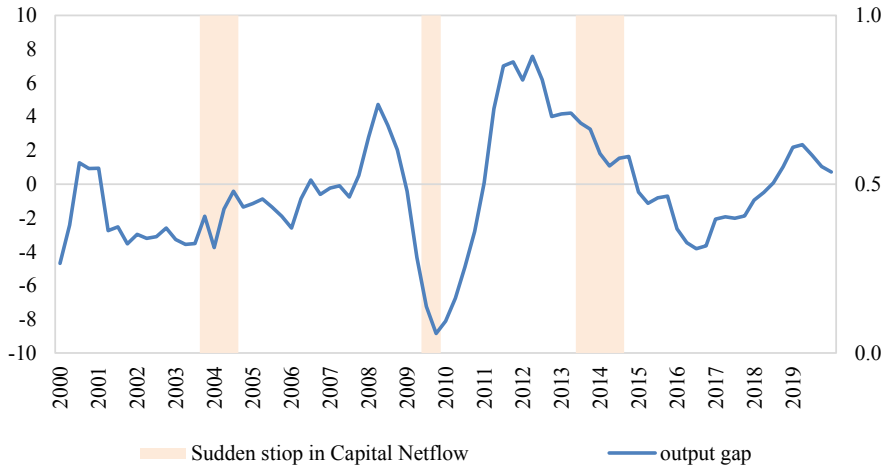
Figure X.4. External sudden stop in capital flow and output gap

Sudden stiop in Capital Netflow   output gap

*Output gap is an estimate of the Bank of Mongolia, Source: Inflation report March 2020

Figure X.5. External sudden stop in capital flow and current account YoY change

Sudden stop in Capital Netflow   change in CAB