

# IMF Working Paper

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## Macroprudential Policies for a Resource Rich Economy: The Case of Mongolia

*Rodolfo Maino, Patrick Imam, and  
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**IMF Working Paper**

Asia and Pacific Department

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**Abstract**

This paper explores the extent to which macroprudential tools can be used to manage banking sector risks in Mongolia, a commodity producing country exposed to both procyclical and cross-sectional financial sector risks. Loose fiscal policy, rising credit activity, and heightened risk appetite—attributable to the commodity boom—are fuelling price volatility in asset markets, posing significant risks to financial stability if left unchecked. Rising interconnectedness, potential increase in dollarization and concentrated exposures are compounding those risks. Macroprudential tools can complement fiscal and monetary policy adjustments to avoid the buildup of vulnerabilities in the banking sector.

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## I. INTRODUCTION

Mongolia—a country rich in natural resources and in the process of rapid financial deepening—has made important strides to overcome the severe financial distress experienced in 2009. However, rapidly rising government spending is again raising the risk of macroeconomic instability. The Fund has recommended reorienting policies to contain overheating and strengthen the economy’s ability to endure the prolonged weakness of the global environment and downside risks to the outlook. The challenges to maintain macroeconomic and financial stability are likely to mount as Mongolia further develops its natural resources.

In the aftermath of the global financial crisis, the debate in the international arena on the use of macroprudential policies has intensified. There is now broad agreement that the chief objective of macroprudential policies is to maintain financial stability. Accordingly, macroprudential instruments can be deployed to complement traditional macro-management tools, allowing policymakers to target a wider set of objectives and to respond to additional shocks, in particular those which can entail negative effects on financial stability. In Mongolia, macroprudential policies are already used to complement classical demand management tools. This paper seeks to assess systemic risks affecting the Mongolian economy, identifying macroprudential instruments to be used concomitantly with traditional monetary and fiscal policies.

## II. THE MONGOLIAN CONTEXT

Mongolia’s long-term prospects are bright. While the economic transition of Mongolia started three decades ago, it is the extraction of mineral resources in recent years that has been driving the structural change of the economy with a shift in economic production from agriculture to mining. The revenue-windfall has led to a modernization of the economy, investment, and rising urbanization, thus potentially providing a gateway to a prosperous future.

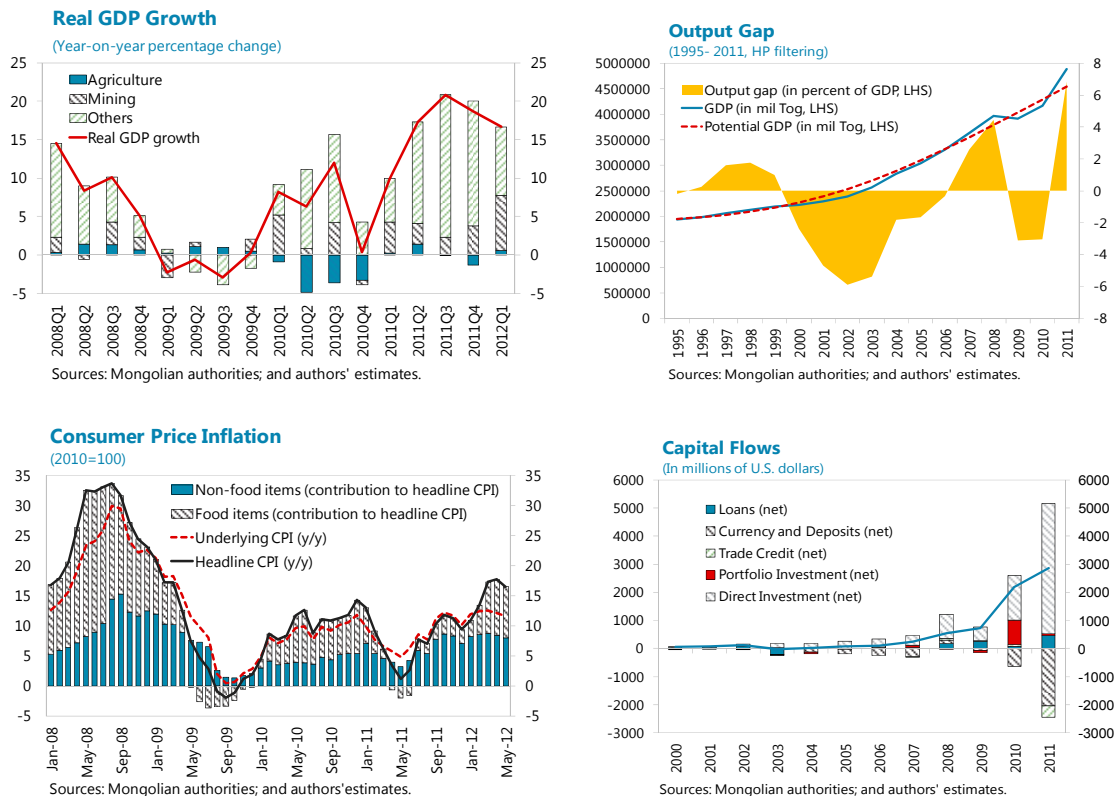
Natural-resource based development is known to be challenging. Mongolia’s challenge in the face of the commodity bonanza is to transform its finite resource wealth into assets that sustain development. However, the relatively poor track record of many resource-rich low-income countries serves as a warning sign. Following an initial boom, both physical and human capital has typically turned out to be lower in the longer term in resource rich economies than in countries lacking such resources.

In recent years, fueled by a loose fiscal policy alongside rising capital inflows in the form of FDI have given rise to overheating pressures. Fiscal expansion and buoyant mineral exports triggered a vigorous recovery following the collapse in 2008, achieving a record high real GDP growth rate of about 17 percent in 2011, and contributing to a positive output gap

(Figure 1). At the same time, private sector credit increased by 72 percent and imports of consumer goods increased by over 80 percent. As a result, inflation hit well ahead of the policy target of a single-digit inflation rate.

The Mongolian financial system is growing rapidly. It is bank-centric (Figure 2) and relatively closed. In 2011, the banking system's assets accounted for 50 percent of GDP and 96 percent of total financial sector assets. While foreign banks are not present in Mongolia, linkages are likely to increase as overseas finance corporations establish a domestic presence to take advantage of the country's rapid growth. External linkages are leading to a rising influx of capital, with bank lending rising quickly, from a low base. The stock market has also boomed in recent years, ranking among the best performers in the world during 2009-2011.<sup>2</sup>

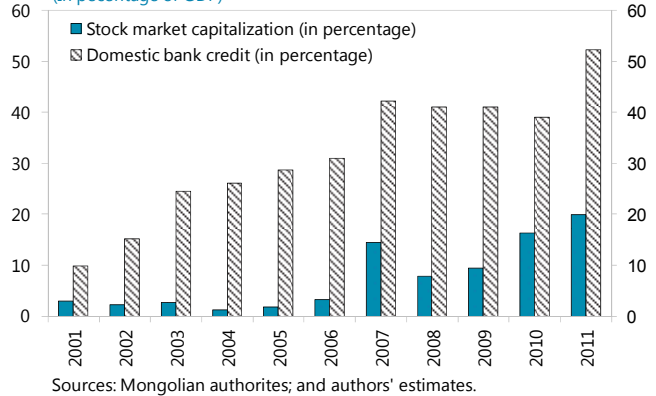
**Figure 1. Mongolia: Output, Inflation, and Capital Flows**



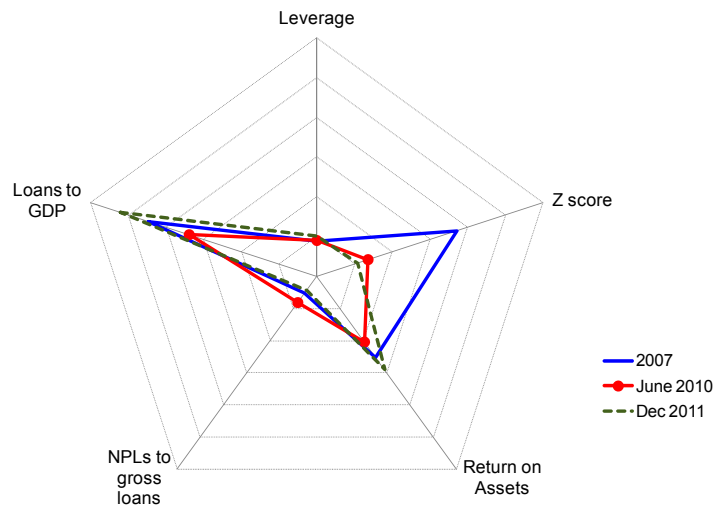
<sup>2</sup>More than 300 companies are currently listed on the Mongolia Stock Exchange (MSE), and market capitalization has surpassed 25 percent of GDP in 2011. However, companies have a very limited trading record as they were only privatized in the early 1990s, and the index retreated 26 percent during the first 10 months of 2012.

This economic boom may, however, increase systemic risk in the financial system. The backward-looking financial soundness indicators suggest that the banking system appears to be fine, but the experience in 2008-09 showed that a sudden downturn could trigger deterioration in the health of the banking system. Furthermore, the average Z-score of the system (a measure of the distance to default) in 2011 is still below pre-crisis levels, pointing to continued fragility (Figure 3).<sup>3</sup> The ratio of liquid assets to total assets has shrunk to 31.4 percent at end-2011, which is below the level at end-2009, while the returns on assets are moving away from the center in Figure 3, showing an improvement in the returns over the previous two years. Against this backdrop, macroprudential tools and regulations could be used to complement traditional macroeconomic policies.

**Figure 2. Mongolia: Financial Intermediation**  
(In percentage of GDP)



**Figure 3. Mongolia: Banking Soundness Map**



Sources: Bank of Mongolia; and authors' estimates.

This paper attempts to identify the buildup of system-wide financial risks and explore the suitability to Mongolia of different macroprudential institutional arrangements. Section III

<sup>3</sup>The Z-score measures the number of standard deviations a return realization has to fall in order to deplete equity—under the assumption of normality of banks' returns. As such, the Z-score can be thought of as a measure of resilience, with a higher Z-score implying stronger resilience to shocks.

assesses macro-financial linkages by looking at procyclical and cross-sectional systemic risks. Section IV considers available institutional models and section V discusses the suitability of potential instruments that would enable Mongolia to dampen procyclicality and control cross-sectional systemic risks. Section VI discusses some critical issues that complement the use of macroprudential tools and monetary policy implementation. Section VII concludes.

### III. MACRO-FINANCIAL LINKAGES IN MONGOLIA

#### A. Financial Stability Risk in Commodity-Producing Countries

The literature has identified financial sector development as a key driver of long-term growth (Levine, 2005), with countries with deeper financial systems growing faster.<sup>4</sup> Smallness of financial system has obvious, though not necessarily visible costs. In the academic literature, micro-studies such as Rajan and Zingales (1998) and macro-level studies (Levine, 2005) have illustrated the causal relationship between financial sector development and economic growth. A small financial system implies a *lack of economies of scale*, as there are significant fixed costs in setting up operations. As more individuals and firms use financial intermediaries, the *information flow* on customers improves, but a small financial system reduces the information-flow function of financial intermediaries (see Greenwood and Jovanovic, 1990). Smallness of the financial system also suggests *limited risk-diversification* options for savers and investors alike. In addition, a small financial system implies that profitable investment opportunities will be forgone, thereby limiting *growth potential*.

Financial development explains economic growth via its influence on resource allocation decisions that foster productivity growth. Rioja and Valev (2004a) find that finance boosts growth in rich countries primarily by speeding-up productivity growth, while finance encourages growth in poorer countries primarily by accelerating capital accumulation. Furthermore, Rioja and Valev (2004b) find that the impact may be nonlinear. They find that countries with very low levels of financial development experience very little growth acceleration from a marginal increase in financial development, while the effect is larger for rich countries and particularly large for middle-income countries. Mongolia may still be in a stage of development where it benefits from financial deepening, while the importance of improved resource allocation is bound to rise.

Mongolia's double-digit growth rates in recent years reflect the tapping of previously unused natural resources (Figure 4). It is endowed with some of the richest mineral deposits in the

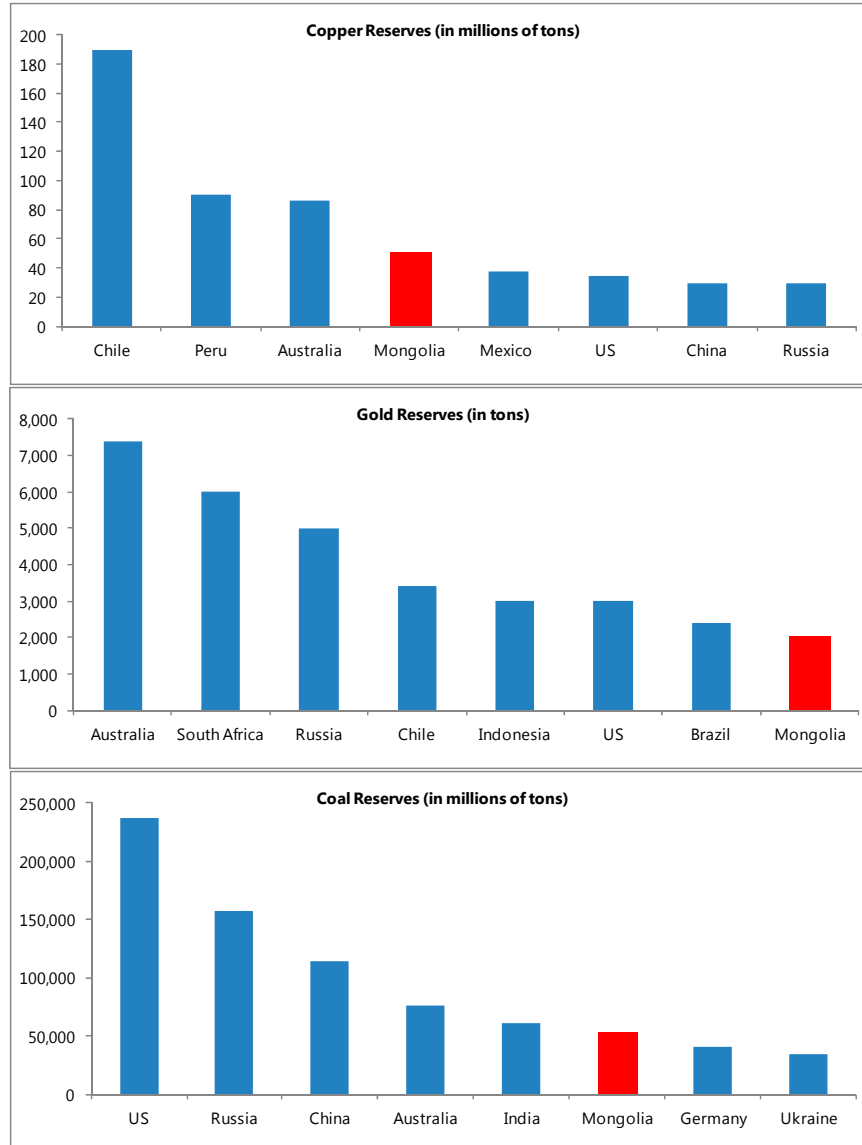
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<sup>4</sup> There is a growing consensus in the literature that the degree of bank-based versus market-based system does not matter much for economic growth (see Allen and Gale, 2000). The overall financial development is more important than the particular institutional arrangements that provide financial services to the economy.



world. As an example, the Oyu Tolgoi (OT) copper mine is the world's largest underdeveloped copper-gold project, while Tavan Tolgoi (TT) is one of the world's largest untapped coal deposits (Box 1).

**Figure 4. Mongolia: Natural Resources Giant**



Sources: Natural Resource Authority of Mongolia; and the U.S. Geological Survey.

### **Box 1. Mongolia: The Effects of Two Large Mining Projects**

#### **Exports of copper and coal are set to rise significantly over the medium term:**

- **The Oyu Tolgoi mine**, located in the south near the Chinese border, will be one of the largest copper and gold mines in the world. The government owns 34 percent of the mine, and the rest is owned by Turquoise Hill Resources (Canada), in which Rio Tinto (UK) has a 51 percent stake. Production is expected to start in early 2013.
- **Tavan Tolgoi**, also located in southern Mongolia, is one of the world's largest untapped coal deposits with estimated reserves of about 6.4 billion tons. Erdenes Tavan Tolgoi LLC, a subsidiary of a 100 percent state-owned enterprise, has the mining license for what is called the eastern bloc (East Tsankhi) as well as the western bloc (West Tsankhi). An operating contract with foreign companies for the eastern block was concluded in October 2011. The modalities for developing the western block are under discussion.

**Export earnings and fiscal revenue will rise considerably, thanks to export revenues from these mines.** Export proceeds from these mines could total US\$2 billion in 2013, rising to US\$7 billion by 2020. Fiscal revenue is projected to grow in tandem, though with some delay, as much of the initial export proceeds from the Oyu Tolgoi mine will be used to repay advanced tax payments and a loan used to finance the government's equity stake. However, by 2018, fiscal mineral revenue is projected to quintuple compared with 2011 and U.S. dollar GDP per capita could triple.

Commodity producing countries, however, face additional constraints to the development of the financial system, which may pose extra financial stability risks. The natural resource curse can: (i) hold back financial development, and (ii) raise risks to the financial system through the following channels for instance:

- **Reduced demand for finance:** A country with abundant resources will absorb shocks and smooth consumption by drawing on resource revenues. This will retard the overall development of the financial system (Gylfason, 2004). While one would normally expect that a wealthier population requires more financial services, evidence suggests that demand for financial services is lower in the natural resource sector than in the non-resource tradable sector. In addition, the non-resource tradable sector is held back by Dutch disease effects.
- **Rent-seeking behavior:** A commodity boom bonanza has led, in many countries, to a change in the behavior of entrepreneurs towards rent-seeking activities (e.g., Mehlum

and others, 2006). All else equal, this behavior reduces the demand for finance compared to the counterfactual where these entrepreneurs would have required finance for start-ups and the expansions of new firms.

- **Distortions of institutions raising risk of lending:** As suggested by Besley and Persson (2010), in countries with large natural resources wealth, it is generally easier to make short-term profits from natural resources than from investment in manufacturing, as proceeds from natural resources are not as dependent on the creation of human and institutional capital. This reduces investment in institutional frameworks that support private property rights, the enforcement of contracts, and transparency, with negative long-term consequences for the institutional set-up needed to encourage finance.
- **Making lending to some sectors riskier:** By raising macroeconomic volatility, lending, particularly to the tradable sector, may become riskier in commodity-producing countries given that resource booms are typically followed by busts. Crowding out of non-resource-based activities, as well as the tradable sector more generally, therefore poses important risk to banks.

## B. Overview of Risks in the Mongolian Financial System

Mongolia's rapid financial expansion would increase systemic risk, requiring an upgrade of existing regulatory policies. The global financial crisis demonstrated that monetary policy aimed at achieving stability of prices combined with micro-prudential regulation is not sufficient to ensure financial stability. As a result, financial regulation is being irrevocably changed.

Policymakers now recognize much more forcefully that prudential regulation, which ensures the safety and soundness of individual institutions, is not sufficient for the promotion and maintenance of financial stability. To complement these policy efforts, what is required, is a strong set of microprudential (entity level) regulations complemented by macroprudential (system-wide) regulation and supervision (Table 1). In fact, one of the important lessons of the global financial crisis is the need to supplement microprudential policies with a macroprudential overlay. Taken together, these measures could help to enhance the shock absorbers in the financial system in terms of capital and liquidity, place constraints on overall leverage, and extend the regulatory perimeter to all systemically important institutions, markets and instruments. While some of this increased systemic risk can partly be contained by tighter fiscal and monetary policies, there are some limitations to these policies.

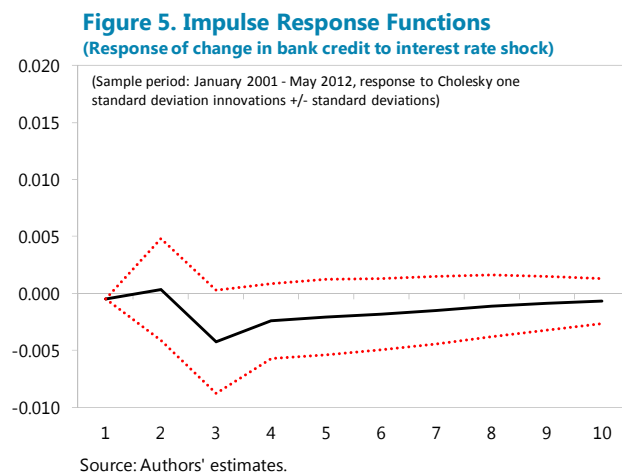
**Table 1. Comparison of Macroprudential and Microprudential Regulation**

	Macroprudential	Microprudential
Proximate objective	Limit financial system-wide distress	Limit distress of individual institutions (solvency risk)
Ultimate objective	Minimize output costs	Consumer (investor/depositor) protection
Model of risk	(In part) endogenous	Exogenous
Interconnectedness and substitutability	Important	Irrelevant
Calibration of prudential controls	In terms of system-wide distress; top-down	In terms of solvency risk; bottom-up

Source: Galati and Moessner (2011).

Given the significant time-lag involved in using fiscal policy for the management of the macroeconomic cycle, the fiscal tools may prevent a timely response to systemic risk, particularly in a democratic setting such as Mongolia's. In fact, government spending patterns in the two years preceding the 2008 and 2012 parliamentary elections suggest a strong political business cycle. The Fiscal Stability Law (FSL) which becomes fully effective in 2013 is designed to make fiscal policy countercyclical. This should help contain the growth of aggregate demand and reduce the risk that boom-bust cycles of government spending spill over into systemic risk. Dell'Ariccia and others (2012) found that conducting fiscal policy in a countercyclical fashion reduces overheating pressures associated with a credit boom, and helps reduce systemic risk.

In the Mongolian setting, monetary policy may also not, on its own, be relied on to reduce system risk. Specifically, we gauge the responsiveness of banks' credit with respect to changes in the policy rate by using recursive VAR analysis. The results presented in the chart on the impulse response functions suggest that bank credit is impacted by the change in the policy rate or 7-day central bank bill rate with some time lag (Figure 5), but also indicate that the transmission looks limited in terms of statistical significance and degree of impact. Simple regressions with some more explanatory variables like industrial production gives a similar result with a limited transmission from the policy rate to bank credit (Table 2). As underlined by Hahm



and others (2012), this result is consistent with the idea of constraints on monetary policy in countries with open capital accounts.

**Table 2. Policy Rate Pass-Through**  
Sample period (January 2001 - May 2012)

	$\Delta$ Bank credit		
	1	2	3
Constant	0.030 ***	0.030 ***	0.026 ***
(Std. error)	(0.007)	(0.007)	(0.007)
[Pval]	[0.000]	[0.000]	[0.000]
Lagged $\Delta$ bank credit (-1)	0.348 ***	0.348 ***	0.349 ***
(Std. error)	(0.082)	(0.081)	(0.082)
[Pval]	[0.000]	[0.000]	[0.000]
Lagged $\Delta$ industrial production (-1)	0.016	0.016	0.014
(Std. error)	(0.017)	(0.017)	(0.017)
[Pval]	[0.355]	[0.353]	[0.419]
CBB 7 day rate (-1)	0.000		
(Std. error)	(0.001)		
[Pval]	[0.934]		
CBB 7 day rate (-2)	-0.002 *	-0.002 **	
(Std. error)	(0.001)	(0.001)	
[Pval]	[0.087]	[0.029]	
CBB 7 day rate (-3)	0.001	0.001	-0.001
(Std. error)	(0.001)	(0.001)	(0.001)
[Pval]	[0.229]	[0.228]	[0.340]
<b>Observations (after adj)</b>	<b>137</b>	<b>137</b>	<b>137</b>
R-squared	0.174	0.174	0.143

Notes: \* indicates 10 percent, \*\* indicates 5 percent, and \*\*\* indicates 1 percent significance, respectively.

Source: Authors' estimates.

Fiscal policy, therefore, needs to be deployed counter-cyclically, building buffers in good times to be deployed in bad ones, while monetary policy should be tightened to avoid overheating. In practice, given the constraints on fiscal and monetary policy, the importance of macroprudential policy to reduce systemic risk is enhanced in the Mongolia context. Macroprudential tools, for example, by reducing the pro-cyclical bias of the financial system and strengthening banks' capital buffers, would help reduce potential risks to the financial system.

In Mongolia, the transmission of systemic risk through financial linkages is rising, given the strong cross-border flows of capital in the form of FDI and the rapid increase in intermediation of capital domestically. Financial linkages—those that transmit risk within financial systems and sectors—exist at three levels: (i) cross market linkages between the domestic money, bond, foreign exchange, and equity markets; (ii) cross institution linkages between banks and also between banks and nonbank financial institutions; and (iii) external

linkages between the global and local financial institutions and markets. With the growing importance of these channels, systemic risk is on the rise. In other words, problems in some part of the banking system or capital markets could lead to the disruption of the sound functioning of the financial system, and this would have negative repercussions for the real economy. Conceptually, systemic risk can be decomposed into time-series and cross-sectional dimensions (see Appendix for more about systemic risks in a macro-financial nexus).

- *In the time-series dimension*, the build-up of risk occurs over time and moves with the macroeconomic cycle. In particular, there is a procyclical bias to risk, with financial institutions and borrowers tending to take on excessive amounts of leverage in the upswing of an economic cycle, only to become overly risk-averse in a downswing. This characteristic amplifies the boom and bust cycle in the supply of credit and liquidity—and by extension in asset prices—which can be so damaging to the real economy.<sup>5</sup> Currently, in Mongolia, credit activity and risk appetite due to the commodity boom are fuelling the kinds of exuberant behaviour in asset markets that can prove so damaging to the financial system if left unchecked.
- *In the cross-sectional dimension*, the growing size and mounting complexity of the banking system are increasing interconnectedness and common exposures conducive to rapid contagion of risks when problems occur. Shocks are amplified and transmitted rapidly between financial institutions. As a result, the failure of one institution—particularly, one of significant size or with strong interconnections—can threaten the system as a whole. Rising exposure to commodity prices and to China, more broadly, means that Mongolia’s economic well-being is becoming increasingly intertwined with that of its neighbor.

There is one important caveat on data. While data on financial stability indicators needs to be improved further, it is important to keep in mind that market prices and other financial indicators may not always be good indicators of actual systemic risk, particularly in periods of exuberance or high stress. Financial stability indicators tend to work best in between periods of calm and stress. For example, in the run-up to the global financial crisis, most risk measures used in financial markets had been signaling decreasing levels of perceived risk precisely when, as subsequent events showed, actual systemic risks were mounting: interest

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<sup>5</sup> It should be noted that not all credit booms lead to a crisis. Chapter 4 in [IMF Country Report No. 06/19](#) found that, for a sample of 73 countries for the period 1980–2002, out of 150 credit booms identified, about a fifth (31) preceded systemic banking crises, with that proportion rising to about a third (47) if minor episodes of financial distress were included. Experience has shown that longer-lasting and more-pronounced booms have a higher chance of leading to a crash.

rate risk premiums, CDS spreads, implied volatility indexes among others had all been declining for several years prior to the first signs of systemic stress in mid-2007 and only spiked after that. Thus, most risk measures behaved procyclically, with risk underestimated during the upswing phase and overestimated during the downswing phase. This deficiency of data arises because financial markets are far from fulfilling the conditions for efficient markets: (i) financial transactions are plagued with *information asymmetries* and *incomplete contracts*; (ii) there are substantial negative *externalities*; (iii) decisions on the purchase and sale of financial instruments are often—and increasingly over the past several decades—*driven by short-term returns and momentum*, rather than by costly information about fundamentals; and as a consequence, the *informational content* of financial market prices about fundamentals (e.g., the expected payoffs or risks attached to the underlying real economic activities being financed) has been increasingly limited (see Brunnermeier and others, 2009).

The main dimensions of the problem of measuring system risk relate to the buildup of latent, *endogenous systemic instability* (Minsky moment); and non-measurable risks. Risk measures—from current market volatility to market risk spreads—even though high frequency in nature, tend to reflect contemporaneous risks, but have empirically speaking little predictive power (Jimenez and Saurina, 2006). Policy actions can therefore not solely rely on such data. Given the difficulty to predict instability, latent instability is a common phenomenon in recent crises, and arises when an apparently small shock (e.g. subprime market, Greece, Japan problem in Japan) triggers a systemic crisis. The build-up of latent instability can last years, with the source of risk being non-linear and varying from crisis to crisis, making predictability of imbalances difficult. Finally, psychological factors, growing complexity and opacity of individual institutions, and financial products render risk-measurement impossible, at least given the current status of our knowledge and data.

For all of these reasons, instead of trying to accurately measure systemic risk, the financial stability analysis in Mongolia must aim to identify a set of leading indicators to convey a broad sense of how risk in the financial system is evolving. A parsimonious but useful set is commonly derived from the behavior of credit and asset prices. In particular, there is evidence that sustained rapid credit growth combined with large increases in property prices increases the probability of an episode of financial instability. A good understanding of credit—who is borrowing, how much, and why—should therefore be a basic building block of macro-prudential surveillance.

### C. Pro-Cyclical Systemic Risks

Mongolia's economic structure is prone to pro-cyclical systemic risk. Being a mineral-producing country, Mongolia's real economy is subject to the vagaries of the global demand for commodities. During a boom, both the external balance and government finances

improve, which encourages the financial system to expand lending, while this reverses during a recession (Figure 6).

In particular,

- **Exports channel**—During a period of global demand for minerals, exports (mainly coal, copper and iron ore) are buoyant, lifting real GDP growth. During the boom, domestic banks are keen to lend, and, when combined with easy access to foreign financing, this creates an upsurge in private sector debt that amplifies the boom.
- **Fiscal channel**—Rising commodities boost government revenues, as they lift royalties and other tax revenues through the multiplier effect. Political pressure on increasing spending creates a pro-cyclical fiscal position that further fuels growth. A fiscal deficit was recorded in 2011 despite high commodity prices. The 2012 budget envisaged a 30 percent increase in spending even as inflation was in double digits, suggesting overheating pressures. Observance of the Fiscal Stability Law, which becomes fully operational with the 2013 budget, should preclude such procyclical fiscal policy.<sup>6</sup>
- **Credit channel**—During the upswing, general optimism leads the financial system to lend more freely to companies and consumers. Credit growth is high as complacency regarding risk itself is leading credit to be extended more easily. Standard precautionary measures are no longer observed or are loosened (e.g. loan-to-value (LTV) ratios are raised), or lending to riskier segments of the population rises. Credit is, therefore, highly procyclical, raising systemic risk when risk appears to be at the lowest level.

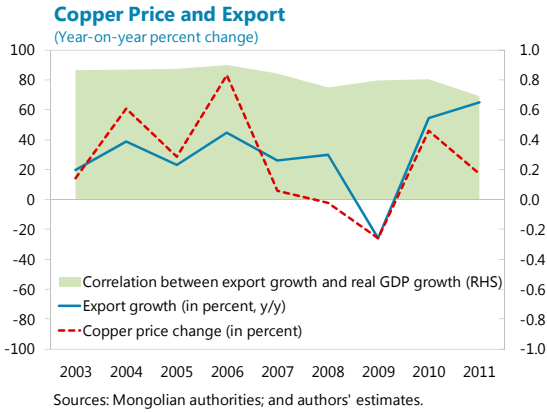
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<sup>6</sup>The FSL passed in 2010 includes several key numerical targets: (i) a structural deficit of two percent of GDP by 2013, which is calculated by using smoothed mineral prices to estimate revenue, but does not adjust for the business cycle; (ii) starting in 2013, spending to grow by less than the greater of non-mineral GDP growth in the budget year or the average of the previous 12 years, allowing for counter-cyclical spending; and (iii) the ceiling on the NPV of public debt to fall from 60 percent of GDP in 2012, to 50 percent of GDP in 2013, and 40 percent of GDP in 2014.

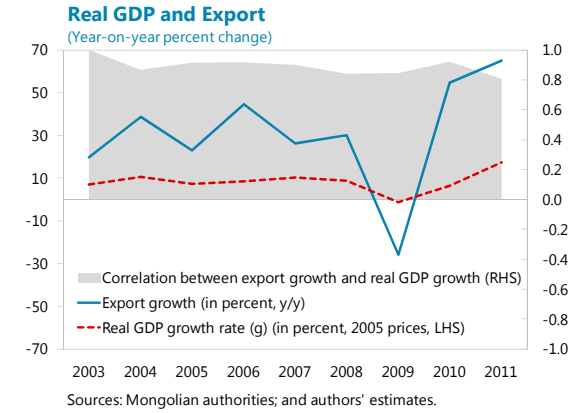


**Figure 6. Time-Series Systemic Risk**

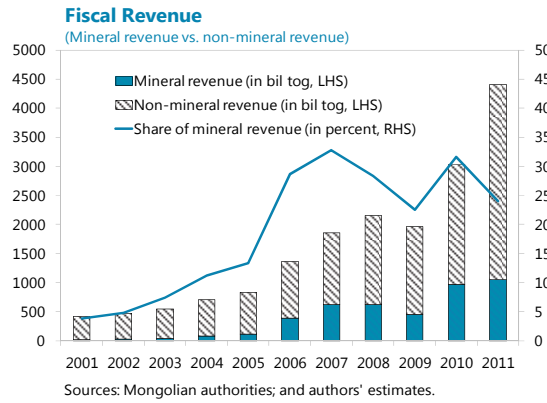
*Export growth moves with commodity prices ...*



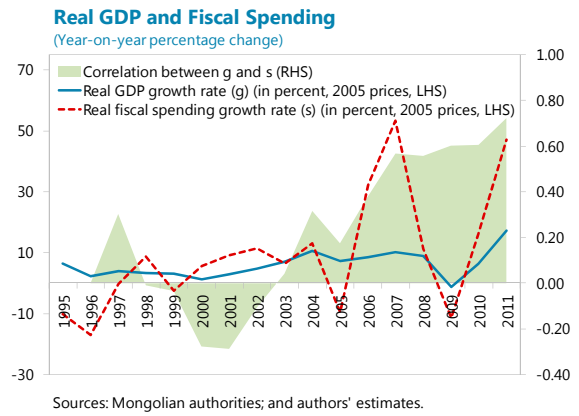
*... impacting GDP growth somewhat.*



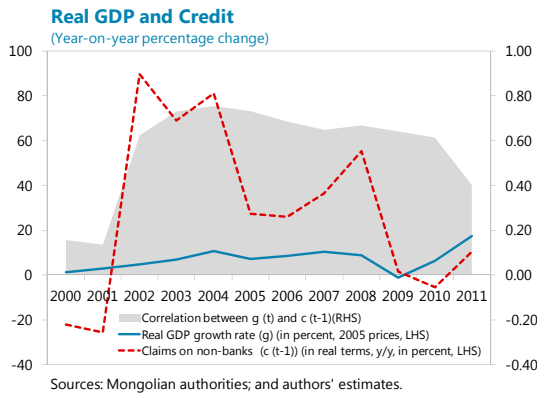
*Fiscal revenue also moves with commodity prices ...*



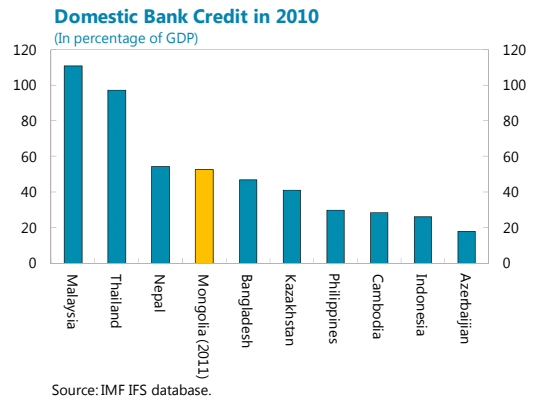
*... and fiscal expenditure is pro-cyclical.*



*Credit growth is pro-cyclical ...*

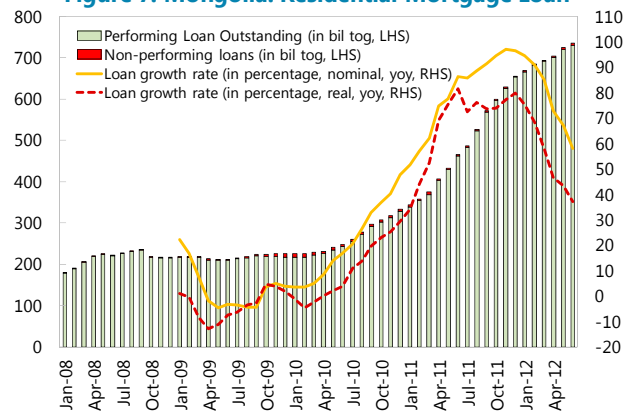


*... expanding further the banking system.*



- Housing channel**—House ownership plays a special role in government policies around the world, and is a major component of the credit channel risk. This includes Mongolia, where the government is eager to stimulate the development of the housing market (Figure 7), which took a big hit during the recent crisis.<sup>7</sup> One characteristic of banking is that it is closely linked to residential property, more than most other sectors of the economy. A larger proportion of bank lending is for the purpose of purchasing housing than for most other purposes. During good normal times, competition will lead to generous forms of borrowing, while during bad times, these will be severely scaled back. Owing to inertia and lags, house price changes are also strongly autocorrelated, and therefore have momentum. Policy measures encouraging real estate activity tend to increase the amplitude of the cycle in the housing market, having a similar effect on the banking cycle with raising systemic risk. Mortgages also tend to be the most leveraged form of borrowing available to households.

**Figure 7. Mongolia: Residential Mortgage Loan**



Sources: Mongolian authorities; and authors' estimates.

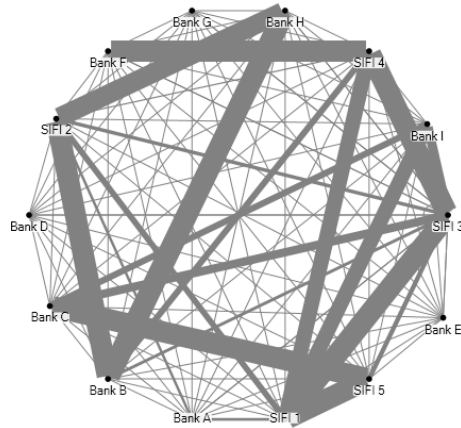
#### D. Cross-Sectional Systemic Risks

Cross-sectional systemic risk is also high in Mongolia, reflecting strong banking interconnectedness, potential increase in dollarization, concentrated levels of exposure, and the presence of five privately-owned systemically important financial institutions (SIFIs). The rapid growth of the banking system in recent years, doubling in asset size in 2011, is creating a more interconnected banking system, where an increasingly complex web of transactions means that a shock hitting one institution could easily reverberate throughout the financial system (Figure 8).

<sup>7</sup> The housing market is often perceived as a public good, with governments likely to support it through a variety of measures, with both direct and indirect subsidies. These include mortgage interest deductibility and preferential treatment for capital gains. The authorities in Mongolia have a program of providing 100,000 apartments, through providing preferential mortgages to civil servants. This program aims to build 100,000 apartments, including 75,000 in the capital. A groundbreaking ceremony was held last August in Yarmag, where 15,000 apartments are to be built in three parts, with each part to be constructed in two phases. The government has decided to allocate 1 million togrogs to citizens who buy an apartment in the project, and the 2012 budget allocates 100 billion togrogs. There is also pent-up demand for housing with many low-income urban residents living in “gers” with limited access to electricity or running water.

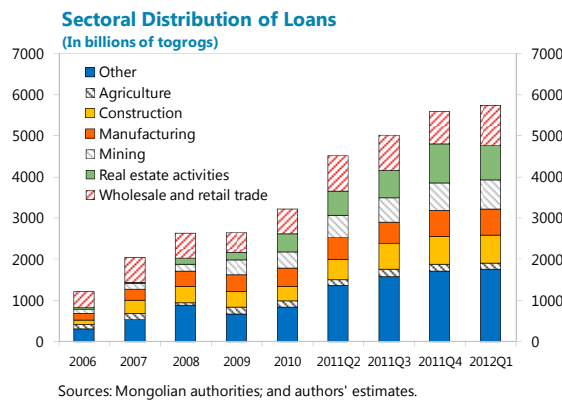
**Figure 8. Mongolia: Cross-Sectional Systemic Risk**

*Cross-Section systemic risk is reflected in rising interconnectedness...*



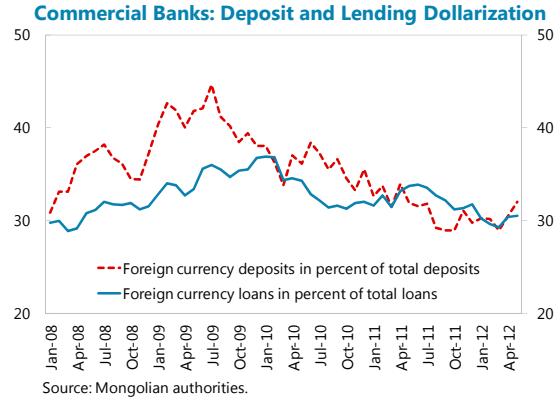
Source: Mongolian authorities; and authors' estimates.

*... and large common exposure of banks ...*



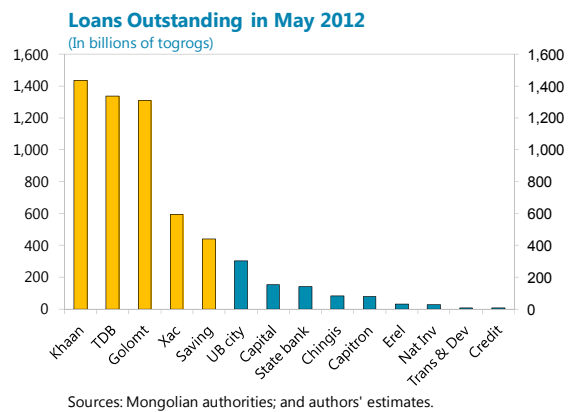
Sources: Mongolian authorities; and authors' estimates.

*...potential increase in dollarization...*



Source: Mongolian authorities.

*... and importance of SIFIs.*



Sources: Mongolian authorities; and authors' estimates.

- **Interconnectedness**—With rising interconnectedness, not only among the top five institutions, but also among the smaller ones, the risk that a shock hitting one institution can spread to others rises. Even if banks are not directly connected, the potential failure of any one bank may impact the whole banking system if there are perceived to be “common factors” among banks. While foreign banks are not present in Mongolia, indirect linkages are increasing as overseas corporations expand their domestic presence.
- **Dollarization**—Deposits and loans in foreign exchange each account for about one third of total deposits and loans, respectively, creating the potential for direct and indirect balance sheet mismatches. The stress tests conducted during the 2010 FSAP confirm large indirect vulnerabilities to foreign exchange (FX) movements, implying that shocks to entities negatively impacted by exchange rate movements could spread rapidly through the system.

- **Common Exposure**—The banking system in Mongolia is highly exposed, directly and indirectly, to the commodity cycle, as well as to China. From corporations to individuals, from the construction sector to the industrial sector, banks are currently lending to entities that are either directly or indirectly exposed to the commodity sector. Any deterioration in commodity prices, and/or a weakening of the Chinese economy, will have an immediate impact on the whole banking system.
- **Systemically Important Financial Institutions**—Five banks dominate the banking landscape in Mongolia, and problems at any one of them are likely to have an externality effect on counterparty banks and institutions, exposing the system to contagion.

#### IV. MACROPRUDENTIAL INSTITUTIONAL FRAMEWORK FOR MONGOLIA

Ultimate responsibility for financial stability in Mongolia resides in the central bank, the Financial Regulatory Council (FRC), and the Financial Stability Committee (FSC), and is discharged as follows:

- the Bank of Mongolia (BOM), as the prudential supervisor of banks, is specifically charged with the maintenance of financial stability (the BOM carries out the supervisory activities both on-site and off-site);
- the FRC regulates other (non-bank) financial institutions;
- the FSC, a steering committee that comprises the Governor of the central bank, the Minister of Finance, and the chairman of the FRC, meets quarterly to discuss potential risks to financial stability.

##### A. Models Available

There is a range of macroprudential institutional frameworks, driven by countries' specificities (e.g., history of institutional arrangements, legal tradition).<sup>8</sup> All models have strengths and weaknesses, but not all models appear equally supportive of effective macroprudential policy making. Upfront, it should be emphasized that macroprudential institutions are new, and their effectiveness will only be tested with time. In addition, as the number of existing arrangements available is small, their relative effectiveness cannot be firmly assessed.

The IMF (2011) classifies macroprudential institutions according to five key dimensions (Table 3). The dimensions are: (i) the degree of institutional integration between central bank and financial regulatory policy functions; (ii) the ownership of the macroprudential mandate; (iii) the role of the government in macroprudential policy setting; (iv) the degree to which

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<sup>8</sup> This section draws on Nier and others (2011a, b) and IMF (2011).

there is organizational separation of decision-making and control over instruments; and (v) whether or not there is a coordinating committee that, while not itself charged with the macroprudential mandate, helps coordinate several bodies.

In the current Mongolian institutional framework, the BOM would seem to be in a good position to take the lead in macroprudential work. The FSC is *de jure* the main coordinating body for macroprudential coordination.<sup>9</sup> The FSC has at its disposal a team, located at the BOM, which conducts analyses and assessments of the overall financial system. This suggests that Mongolia's "twin-peak" model, which involves close institutional integration between the central bank and the prudential supervisor and regulator of potentially systemic financial institutions, such as banks, while the regulation of activities or "conduct" in retail and wholesale financial markets is institutionally separate from the central bank (Model III in Table 3).

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<sup>9</sup> The degree of integration can be full, partial or nonexistent. Full integration between the central bank and supervisory agencies means that all financial supervisory and regulatory functions are carried out by the central bank or by its subsidiaries. Partial integration means that the securities supervisor or business conduct supervisor are separate entities, while banking supervision (or prudential supervision more broadly, also covering insurance) is conducted by the central bank (see IMF, 2011).

**Table 3. Models of Macroprudential Institutions**

Features of the model/Model	Model I	Model II	Model III	Model IV	Model V	Model VI	Model VII	Model R I
1. Degree of institutional integration of central bank and supervisory agencies	Full (at a central bank)	Partial	Partial	Partial	No	No (Partial)	No	No
2. Ownership of macroprudential policy and financial stability mandate	Central bank	Committee "related" to central bank	Independent committee	Central bank	Multiple agencies	Multiple agencies	Multiple agencies	Committee (multinational; regional)
3. Role of MOF/ treasury/government	No (Active)	Passive	Active	No	Passive	Active	No	Passive (European Commission; Economic and Financial Committee)
4. Separation of policy decisions and control over instruments	No	In some areas	Yes	In some areas	No	No	No	Yes
5. Existence of separate body coordinating across policies	No	No	No	No	Yes	Yes	No	No
<b>Examples of specific model countries/ regions</b>	<i>Singapore</i> <i>Czech Republic.</i> <i>Ireland (new)</i>	<i>Romania</i> <i>United Kingdom (new)</i>	<i>Brazil</i> <i>France</i> <i>United States</i> <i>Mongolia</i>	<i>Thailand</i> <i>The Netherlands</i> <i>Serbia</i> <i>Belgium (new)</i>	<i>Australia</i>	<i>Canada,</i> <i>Hong Kong SAR</i> <i>Lebanon</i> <i>Mexico</i>	<i>Iceland</i> <i>Japan</i> <i>Korea</i> <i>Peru</i> <i>Switzerland</i>	<i>EU (ESRB)</i>

Sources: IMF (2011); and authors' additions.

The legal foundations creating the FSC make it currently rather ineffective. The legal document does not clearly identify the entities that are responsible for macroprudential policies. They tend to be low profile and discussions tend to be focused on specific issues, as opposed to systemic risk more broadly. The limited weight of the FSC is reflected in the lack of a permanent secretariat, with only a limited number of persons at the central bank assigned to FSC-related activities. Established by joint decree, the legal basis for FSC recommendations and decisions is weak and not of the same legal stature as the budget laws and the central bank law, thus weakening the accountability mechanism.

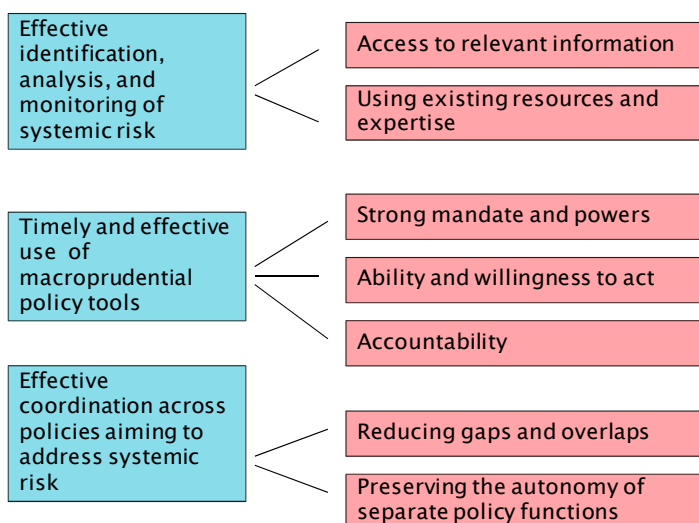
The coordination functions of the institutional arrangement are crucial to effectively reduce systemic risk. *De facto*, the most important macroprudential/financial stability institution in Mongolia is the BOM, as it is in charge of banking supervision, which in 2011 accounted for 96 percent of the financial system. The relative weight of the BOM derives from two factors. First, the FSC lacks adequate legal powers. Second, Mongolia's financial system is bank-centric and both the analysis of systemic risk and the tool box to tackle it are under the BOM. This may be workable for now; however, going forward, as Mongolia's non-bank financial system gains in sophistication, the role of the FSC should be reinforced.

### **B. Key Drivers for Effective Macroprudential Policy Arrangements**

While there is no one-size-fits-all institutional set-up, there are some minimum criteria that need to be fulfilled to make it effective (Table 3). The two basic elements of an institutional framework for macroprudential policy are: (i) the presence of a well-identified authority (an institution or a policy committee) that has a clear macroprudential mandate; and (ii) a mechanism promoting consistency across policies to preserve financial stability (see Nier and others, 2011).

In principle, model III could be conducive to effective mitigation of systemic risk, if: (i) it provides for effective identification, analysis and monitoring of systemic risk; and (ii) provides for timely and effective use of macroprudential policy tools by avoiding coordination problems to address systemic risk to reduce gaps and overlaps (Figure 9).

**Figure 9. Criteria for Effectiveness of Macroprudential Institutional Model**



Source: Nier and others (2011).

### **Identification and Monitoring Risk**

On surveillance, the main challenge is to identify the macro-economic and financial variables that provide the most insight into the potential risks and vulnerabilities facing the financial system. This information obviously varies from country to country depending on the breadth of the country's macroeconomic and financial sector statistics and the availability of market-based information. The challenge in Mongolia is to identify the data set that is most likely to provide warnings of systemic risks and so provide an opportunity to respond preemptively.

As regards risk identification, the FSC's access to the in-house research department of the BOM in conjunction with the regulatory data from the BOM on banking and FRC on non-banking activities should facilitate the monitoring of systemic risk. Under this model, the FSC can ensure that incentives are in place for proactive delivery of relevant information to the decision-maker. This model could assure full access to quantitative as well as qualitative microprudential data, assuming there are no legal restrictions related to confidentiality. The analysis of risks could bring together microprudential expertise and risk assessments with assessments of macro-financial linkages by central bank staff, enriching and fully exploiting complementarities between top-down and bottom-up risk analysis. This would be useful for stress-testing for instance. In this regard, it should be noted that the FSAP conducted in 2010 indicated that the stress testing mechanisms need to be further strengthened in Mongolia.

Integration of the banking regulator within the central bank also ensures that full use could be made of important existing analytical expertise. Due to its existing roles in monetary policy and payment systems, the BOM could bring expertise in the analysis of systemic risks that



are crucial to inform macroprudential policies. The BOM could bring in expertise in the analysis of aggregate and sectoral developments that could be brought to bear in the design of policies designed to reduce procyclicality risks. Furthermore, the BOM's role in the oversight of payment systems and as lender of last resort generates expertise that is critical for the design of macroprudential measures.

In terms of communicating risks to the markets and the general public, the FSC's communication infrastructure must be developed, to ensure that it does not overlap with the BOM's. One potential cost of the existing model is the duplication of some communication functions. Due to their monetary policy and financial stability functions, central banks are in principle experienced in communicating risks to the markets and general public, a key aspect of macroprudential policy making. The FSC would need to develop its own communication infrastructure, though its housing at the BOM's could ensure some minimizing of duplication. The separation of the FSC's view from the BOM's should ensure that risk warnings and messages are coherently attributed to the respective entities.

However, as regards risk identification, the current model may limit institutional mechanisms to challenge the various views, as it relies heavily on the BOM. In particular, there is a risk that "house views" become entrenched if there is no culture within the organization of encouraging and debating contrarian views. In addition, the current weakness of the risk-monitoring function of the BOM, and the ample room to strengthen microprudential regulation as highlighted in the 2010 FSAP, suggests that synergies are currently weak. Going forward, the BOM should strengthen expertise in monitoring financial markets, which is under the purview of the FRC. This requires it to have open communications with the FRC to ensure that the whole spectrum of systemic risk is monitored.

### **Use of Macroprudential Tools/Coordination**

For the mitigation of risk within the financial system, the task is a shared responsibility led by the FSC, with the central bank and the regulatory agency playing an important role. For the central bank, much of its contribution to these efforts will come from fulfillment of its other core policy objectives: a sound monetary policy to promote a low-inflation environment and the development of a robust payments infrastructure, including a reliable settlement system (Box 2). The central bank's support for system liquidity through financial market operations is also vital to financial stability. In addition, in its role as a banking regulator, and in conjunction with the FRC as a non-bank financial system regulator, risk mitigation requires each of them to pursue the types of best prudential practice identified in the various international standards and codes, tailored where appropriate to national circumstances. Progress on corporate governance, insolvency, creditor protection, and implementation of suitable accounting and auditing standards also plays a vital role in promoting financial stability.

Assigning the macroprudential policy mandate to the FSC, which has no role in monetary policy, would be helpful to prevent reputational cross-over. Clear separation of monetary and macroprudential policy functions avoid the cost of a loss of credibility for the monetary policy function in the event of macroprudential policy failure. Reputational loss of highly visible failure to deliver effective macroprudential policies would be more easily contained to those delivering the macroprudential function and less likely to hurt the reputation and independence of the BOM. Failures in microprudential supervision could affect the credibility of the monetary policymaker and could undermine the independence of the monetary policy function. This is a greater danger in the absence of clearly separate accountability frameworks for monetary and prudential action.

Nonetheless, assigning accountability for the macroprudential mandate becomes essential to facilitate a timely and efficient use of macroprudential tools. If the mandate and responsibility are assigned to more than one agency, it increases incentive and accountability problems that arise when responsibility is shared between agencies.

### **Coordination**

Fostering action across policy functions would be facilitated if all functions were under one roof. In particular,

- coordination across objectives and functions (macroprudential, monetary and microprudential) within an organization rather than across organizations can increase the effectiveness of decision-making when there is a need to internalize trade-offs (e.g., price stability versus financial stability, systemic risk mitigation versus consumer protection);
- full integration reduces mismatches between the reach of mandates and the reach of powers, since the decision-maker has control over most of the relevant tools, including those available to a microprudential regulator; and
- coordination across policy functions is achievable without compromising the operational autonomy of separate agencies.

On the one hand, a strong role for the treasury on the FSC poses a risk that short-term political considerations may prevail over the achievement of long-term financial stability. It could also cause delays when the FSC needs to take strong countercyclical action. On the other hand, a balanced committee structure may create a greater risk that differences of view will persist and remain unresolved, leading to delays in taking action. However, the involvement of the treasury may also result in the government gaining a better understanding of the buildup of systemic risk. The pressure of commercial banks on the BOM may also be mitigated in the Mongolian model.

### Box 2. Monetary Policy Committee (MPC) and Financial Stability Committee (FSC): Similarities and Differences

The difference in how monetary policy differs from financial stability is better gauged by comparing the institutional set-up of a MPC and a FSC.

**The mandate of a MPC is clear.** A *narrow* mandate (price stability) with a clear and *measurable* objective (inflation) and an appropriate set of *tools* (e.g. policy interest rate) means that accountability of an independent institution (central bank) can be established relatively easily. This explains why decision making is often by majority, and the MPC is typically composed of monetary economists.

**The FSC's mandate is more wide-ranging.** Financial stability is broader in nature, lacks a simple metric to quantify it, and requires a multiplicity of instruments to tackle it. Financial stability cannot be measured as a continuously observed number like inflation (difficult to measure systemic risk); we frequently only recognize financial instability *ex post*. Against this background, accountability is harder to enforce as the effectiveness of their role is not easily established. This explains why FSCs tend to have an advisory role, as they have a broader scope, rely more on judgment and less on quantitative frameworks. Currently, many FSCs' power is achieved through moral suasion. The risk is that the ultimate decisions of FSCs, in the form of advice, can simply be ignored by the respective entities, thereby reducing the relevance of the FSC.

Monetary Policy Committee versus Financial Stability Committee

	Monetary Policy Committee (MPC)	Financial Stability Committee (FSC)
<b>Objective</b>	Low inflation	Financial stability
<b>Target</b>	CPI (hard target)	Not clearly measurable (soft target)
<b>Breadth of mandate</b>	Narrow	Broad
<b>Distribution of risk</b>	Normal Distribution	Tail Risks
<b>Outcome</b>	Success Measurable	Counterfactual not measurable
<b>Members</b>	Central Banks	Central Bank, Regulators and Ministry of Finance
<b>Decision-making procedure</b>	(Typically) Majority Rule	Consensual, but cannot pressure any participant
<b>Accountability</b>	Yes	Not clearly measurable
<b>Own policy instrument</b>	Yes	No
<b>Punishment mechanism for failing mandate</b>	Yes (often sacking of Governor, or at least writing justification letter)	Not clear, as no clear accountability and allocation of responsibility
<b>Costs of failing target</b>	Higher/lower inflation	Crisis
<b>Discretionary versus automatic rule</b>	Discretionary rule	Discretionary and automatic rule

Source: IMF staff.

### C. Way Forward for the Macprudential Institution

While the FSC is an evolving institution, whose mandate and structure will have to be recalibrated with the passage of time as more experience is gained, several steps could be considered to raise its effectiveness, including:

- modifying the statutes of the FSC from decree into law. This would raise the prominence of the statutes. Along with enhanced accountability (see next bullet) this could be expected to get the various actors actively involved;
- enhancing the accountability of the FSC—currently overshadowed by monetary policy and microprudential supervision—to encompass the minimization of the buildup of systemic risk, through regularly updating parliament and/or publishing its assessment;
- improving accountability by publicizing dissenting views among the FSC members and /or publishing its assessment consistent with the confidentiality and privacy of information of individual members;
- appointing a permanent secretary to the FSC, to be housed at the BOM, to elevate its role and provide the necessary institutional setting;
- granting the FSC the power to make “recommendations”—which need to be general and may not refer to the supervision of specific institutions; and
- establishing a macroprudential unit within the BOM, comprising a macroeconomist, researchers, and prudential regulators with the task of enhancing macroprudential analysis.

## **V. MACROPRUDENTIAL INSTRUMENTS FOR MONGOLIA**

### **A. Dampening Procyclicality**

The choice of instrument depends on the circumstances of individual countries, from the stage of economic development to the structure of the economy. Mature economies, with large bank and non-bank systems, shallower business cycles, and typically fewer market failures, tend to make less use of macroprudential instruments than emerging markets. Countries with fixed exchange rate regimes tend to make greater use of such instruments, given that such an exchange rate arrangement limits the scope for interest rate policy. Empirically, it also seems that macroprudential instruments are used in combination, rather than singularly, presumably to eliminate arbitrage and ensure that a risk is tackled from various angles (see IMF, 2011). Following the ongoing global crisis, advanced economies appear more open to start utilizing macroprudential tools, either under the auspices of Basel III (e.g. countercyclical capital), or to complement the monetary transmission mechanism. Nonetheless, the limited experience with these tools in advanced economies suggests that a trial-and-error phase to calibrate the tools is likely.

Enhanced surveillance will facilitate efforts to mitigate the procyclical bias of the financial system. If the emergence of systemic risks can be identified early enough in the economic cycle, then it may be possible to counter them with pre-emptive policy measures. Monetary policy will have an important role to play in this regard, but there will be limits to the extent to which monetary policy tools can be used to counter these risks so long as the primary objective of monetary policy is price stability. The search for policy measures that might complement the role of monetary policy have so far concentrated on (Table 4):

- *Countercyclical capital requirements*, which would add a buffer to capital requirements based on the current cyclical position of the economy;
- *Variable risk weights* that would raise capital requirements for specific types of lending, such as real estate;
- *Forward-looking provisioning* to link loss provisions to the credit cycle, so banks are forced to put money aside for future potential losses when credit is growing strongly;
- *Collateral requirements* that impose higher collateral restrictions on some activities. Examples include loan-to-value limits on secured lending and minimum haircuts or margins on securities financing transactions;
- *Quantitative credit controls and reserve requirements* that limit lending, either directly or indirectly, by increasing short-term liquidity requirements.

Mongolia has, thus far, utilized the following macro-prudential measures, which are conducive to strengthening the buffers in the banking system:

- *Increase in the liquidity ratio*: the ratio was raised from 18 to 25 percent in 2011. However, this was not a binding increase given that banks' current liquidity ratio is 36 percent.
- *Increase in the Capital Adequacy Ratio*: it has been raised from 12 to 14 percent for the 5 systemic banks which account for the lion's share of the market. This permanent increase in these banks' capital buffers would be akin to a SIFI surcharge.
- *Limits on exposure concentration*: the total value of loans, loan equivalent assets, guarantees and warranties provided to one person and/or his/her related party shall not exceed 20 percent of the capital of the bank. In the case of a bank's related party, it shall not exceed five percent. (Revised Banking Law on Jan 28, 2010, and BOM Governor's order No. 460 on July 30, 2010—Regulation on setting and supervising prudential ratios of banking operations).

- *Limits on net open currency positions*: the amount of a single foreign exchange open position should not exceed 15 percent of the bank's equity capital.<sup>10</sup>
- *Limits on maturity mismatches*: the difference between average durations of assets and liabilities shall not exceed 30 percent of total assets' average duration.
- *Reserve requirement*: all licensed banks must meet the reserve requirement applied against both domestic and foreign currency deposits.<sup>11</sup>
- *Provisioning*: the provisioning rate was reduced at the time of the crisis.<sup>12</sup>

However, countercyclical capital buffers have been absent from the current toolkit in Mongolia. This is surprising, as the use of countercyclical capital buffers has found strong support globally because they are efficient tools to reduce procyclical tendencies within the financial system by smoothing out the flow of credit through the economic cycle.

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<sup>10</sup> BOM Governor's order No. 460 on July 30, 2010—Regulation on setting and supervising prudential ratios of banking operations.

<sup>11</sup> BOM Governor's order No.118 date March 5, 2007.

<sup>12</sup> BOM Governor's order No. 460 on July 30, 2010—Regulation on setting and supervising prudential ratios of banking operations.

**Table 4. Classification of Macroprudential Tools**

<b>Policy Tool</b>	<b>Motivation/Objective</b>
Countercyclical capital requirements	Buffer ranging between 0 - 2.5% to be introduced when aggregate credit is growing too fast.
Dynamic provisioning	Countercyclical tool that builds up a cushion against expected losses in good times so that they can be released in bad times.
Leverage ratios	Constrain the leverage in the banking sector, to mitigate the risk of the destabilizing deleveraging processes.
Reserve requirements on bank deposits	Counter-cyclical tool that acts as: i) speed limit on credit; ii) tool for credit allocation; and iii) complement to monetary policy to achieve macroprudential goals.
Loan-to-value (LTVs) ratios	Regulatory limit to moderate cycles in specific sectors by limiting loan growth and leaning on asset demand.
Debt-to-income (DTIs) ratios	Measure to limit the leverage of borrowers and manage credit risk.
Liquidity requirements	Tools to identify, measure, monitor and/or control liquidity risk under conditions of stress.
Tools to manage foreign exchange credit risk	Tool to internalize foreign exchange credit risks associated with lending to unhedged borrower.
Limits to foreign exchange positions	Measures to manage foreign exchange risk in on and off balance sheet FX-denominated assets and liabilities. Also useful for dealing with surges in capital inflows which may pose systemic risks to the financial system when they create "bubbles" in certain economic sectors.

Source: Terrier and others (2011).

The Basel Committee on Banking Supervision (BCBS) has agreed to two capital buffers, which, together, should help smooth out the flow of credit through the economic cycle:<sup>13</sup>

- The first is a *capital conservation buffer* to be set as a fixed proportion of risk-weighted assets. This buffer may be run down during periods of stress, lessening the pressure on banks to restrict credit. But its primary objective is to prevent banks that

<sup>13</sup>Basel Committee on Banking Supervision, "Group of Governors and Heads of Supervision announce higher global minimum capital requirements" Press Release 12 September 2010. These proposals include a conservation capital buffer of 2 ½ percentage points on top of minimum requirements and an additional counter-cyclical buffer of 0–2 ½ percent.

are losing money and approaching their minimum capital requirements from paying out capital and further depleting their reserves.

- The second is an additional *countercyclical buffer* to be imposed in periods of rapid credit growth if national authorities judge that this is aggravating system-wide risk. Conversely, this capital could be released in the downturn of the cycle to reduce the risk that the supply of credit might be constrained by regulatory capital requirements. The BCBS anticipates that the ratio of credit to GDP would serve as a common reference in the buildup phase, but with a broader set of indicators, including asset prices, also taken into account.

While a consensus has yet to emerge around the value of other countercyclical measures, some already have strong supporters. For example, Spain has been a long-term advocate of dynamic provisioning policies. However, while these measures helped to dampen the housing bubble, the buffers were not sufficiently elevated to avoid a boom-bust cycle. In India, the central bank has used differential weighting in capital regulation to slow the pace of growth of bank credit to housing and commercial real estate. The use of loan-to-value (LTV) ratios and restrictions on mortgage lending is quite common in Asia. In Mongolia, the policy to encourage housing ownership is leading to reluctance to alter the Loan-to-Value ratio and Debt-to-Income Ratio. While understandable in the short-run, such an aversion to use macroprudential tools to reduce the boom-bust cycle in housing may in the longer run harm home-ownership, and the poor in particular. Rising house prices make it ever more costly for the middle and lower classes to jump on the housing ladder, requiring ever larger leverage.

### **Dynamic Provisioning: A Simulation Exercise**

Backward-looking loan loss provisioning rules usually contribute to episodes of credit booms by inducing excessive risk-taking and reducing incentives for prudent loan origination. After a period of high credit demand and lax lending standards, procyclical lending and provisioning manifest themselves after a downturn, when a rise in non-performing loans and specific loan loss provisions cause a credit crunch.

Dynamic loan loss provisioning helps to mitigate procyclicality in lending and provisioning. By requiring banks to make provisions against loans outstanding in each period in line with the estimate of long-run expected loan loss rather than actual loss, the stock of dynamic provisions grows rapidly as loan origination is high and loan losses are typically low (during an economic upswing) and additional provisions for loan losses are covered by drawing on the stock of dynamic provisions (during economic slowdowns).

We simulate dynamic provisioning by assuming that banks contribute to their individual provisioning funds the difference between the monthly statistical losses on loans to the non-



financial private sector and the realized net loan loss in that month. The statistical losses are calculated from the expected rate of loss for the respective loan categories, including specific risk loans weighted by the respective loan volumes. Formally,

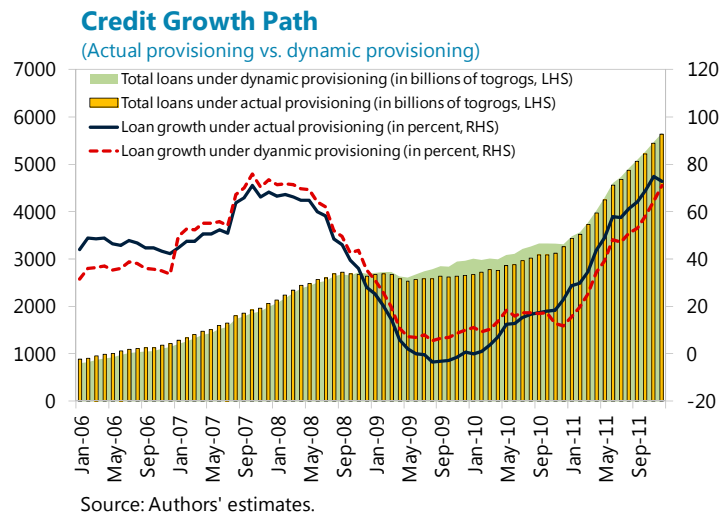
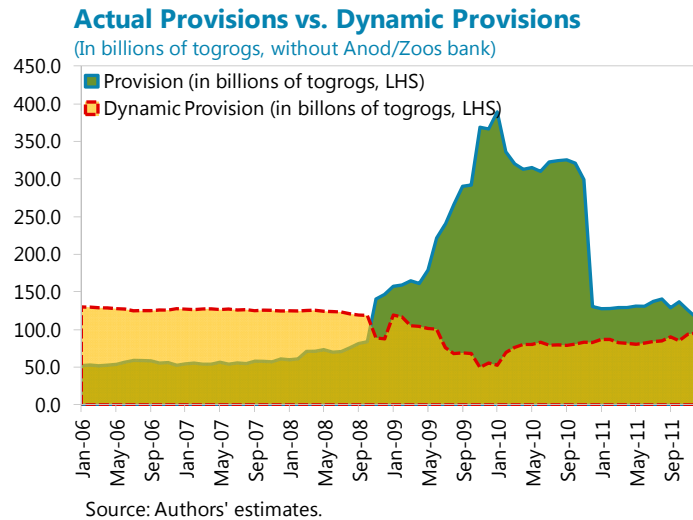
$$DP_t = \sum_{i=1}^n \frac{1}{12} \beta_i c_{it} - LL_t$$

where  $DP_t$  represents the contribution to the dynamic provisions fund—we assumed the average of actual provisioning under the assumption of perfect-foresight— and  $LL_t$  is the net loan loss incurred in the current month—we assumed that some specific portion of NPL would have been realized as losses.

The countercyclical effects show how cushions of dynamic provisioning would help absorb loan losses. Figure 10 illustrates actual provisions in 2006-2011 with the evolution of simulated dynamic provisions over the same period. The countercyclical system took effect toward the end of the previous credit cycle. As a result, when the financial crisis of 2008/09 hit, the small cushion of dynamic provisions could only absorb a fraction of the large loan losses.

Dynamic provisions could be a good measure to smooth out pro-cyclicality. Over the longer-term this should include measures that have an element of automaticity about them, to help minimize the risk of policy inertia. Preliminary simulations point to a smoother credit growth path had Mongolia adopted dynamic provisions in the past, and therefore a safer financial system, but also less macroeconomic volatility (Figure 10).

**Figure 10. Simulating Dynamic Provisioning in Mongolia**



A vector error correction model (VECM)—based on quarterly data on real industrial production, domestic credit, and provisions for the period 2006-2012—confirms (Table 5) that, in the long run, real industrial production exhibits a contemporaneous positive correlation with real credit and a negative correlation with provisions. Nevertheless, the short-run dynamics show that changes in provisions play a small role in explaining real industrial production and credit growth. Accordingly, there seems to be a case for using regulatory dynamic provisions in Mongolia to contain the risk of bank insolvency and to dampen credit procyclicality.

**Table 5. Dynamic Provisioning: A Vector Error Correction Model**

Cointegrating Eq:			
Industrial Production, 1 lag	1	n/a	
Real Credit, 1 lag	-0.83	[-2.00]	
Provisions, 1 lag	0.44	[7.38]	
Constant	-20.32	n/a	
Error Correction Equations	Industrial Production	Real Credit	Provisions
Cointegrating Equation	0.17 [-2.887]	0.72 [ 0.791]	-0.126 [-5.682]
First Differences			
Log of industrial production, lag 1	-0.23 [-0.196]	0.11 [0.295]	-0.19 [-0.450]
lag 2	-0.143 [-1.227]	-0.66 [-0.730]	0.42 [2.191]
Log of real credit, lag 1	0.81 [0.196]	0.32 [ 0.295]	-0.089 [-0.557]
lag 2	0.79 [0.341]	0.46 [0.295]	-0.014 [-0.023]
Log of provisions, lag 1	-0.017 [-0.901]	0.1008 [0.861]	0.302 [0.586]
lag 2	0.009 [0.763]	0.0678 [0.869]	0.028 [1.002]
Constant	0.101 [0.701]	0.081 [0.456]	-0.027 [0.960]
R-squared	0.23	0.63	0.44
Adj. R-squared	0.14	0.59	0.38
F-statistic	2.64	15.47	7.11

Source: Authors' estimates.

## B. Reducing Cross-Sectional Systemic Risk

### Systemically Important Financial Institutions and Interconnectedness

Threats to the financial system can never be eliminated completely. As a result, there is a need to enhance the resilience of the financial system so that it can more comfortably ride out periods of stress, including the occasional failure of a financial institution. This prospect has generated a wide-ranging debate over exactly which institutions should be the subject of most attention i.e., which are the SIFIs—those of such a size or market presence that their failure will almost certainly jeopardize the smooth functioning of the global financial system (Ötoker-Robe and others, 2010).

Measures to enhance the resilience of the financial system need to be calibrated so that they reflect the potential threat that each institution represents to the financial system as a whole, rather than the level of risk on a stand-alone basis. As agreed by the FSB and BCBS, SIFIs

should have loss absorbing capacities beyond common capital standards and should certainly be subject to a higher degree of supervisory oversight than would otherwise apply.<sup>14</sup>

SIFIs add disproportionately to systemic risk. These institutions, whose viability is crucial for the smooth functioning of the financial system due to their size or interconnectedness, are unable to exit the market without causing major disruptions. As they carry implicit government guarantees, they are able to borrow at cheaper rates than other financial institutions, causing an uneven playing field. Besides having more favorable funding conditions, they can also take on more risks, in the knowledge that they may be bailed out, if that becomes necessary.

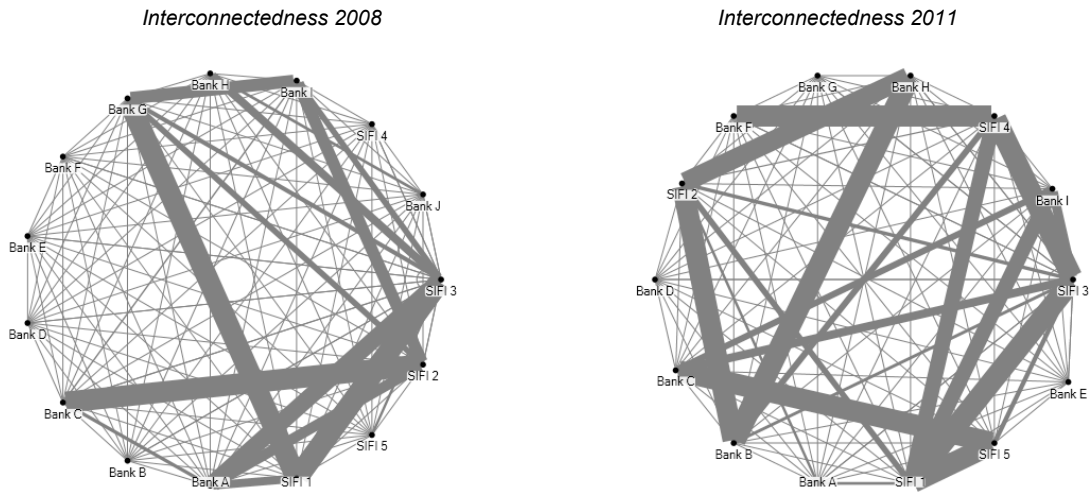
Recognizing these problems, Mongolia has designated five institutions<sup>15</sup> as SIFIs, tightened supervision and added loss absorbency requirements by requiring higher capital adequacy ratios. The five SIFIs are subject to capital requirements that are two percentage points higher than for other banks. The SIFIs appear to have been identified based on their *size*. SIFIs can, however, also hide under different criteria. *Interconnectedness*—where distress in one institution leads to distress in other institutions—may also be important in the Mongolian context. Some banks, while not among the largest, appear highly interconnected, and may therefore require extra supervision and/or capital (Figure 11). Mongolia is also characterized by a *common exposure of banks*. This may lead to financial institutions that hold similar positions to competitors, such that a common shock could cause distress to several institutions simultaneously.<sup>16</sup>

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<sup>14</sup> Work is still underway to delineate the modalities for addressing systemic risk, but a systemic capital surcharge to SIFIs, particularly those with a significant cross-border presence, has already been adopted, which varies from 0.5-2.5 percent of capital.

<sup>15</sup> Khan Bank, Golomt Bank, Trade and Development Bank (TDB), Xac Bank, and Savings Bank.

<sup>16</sup> Other criteria that may apply to SIFIs are: (i) *substitutability*—some banks provide services that are critical to the operation of the financial system that couldn't be replaced in case of their exit; and (ii) *concentration*—some market segments feature a few large players that dominate a market for a given financial service, with few alternatives. However, these criteria are likely to be of lesser importance in the Mongolian context.

**Figure 11. Interconnectedness**

Source: Authors' estimates.

Mongolian banking institutions do not have complex group structures. As recent experience in a number of advanced countries has demonstrated only too well, when the largest banks run into problems, the whole system is at risk. In the absence of robust and effective resolution regimes, countries may have little choice but to bail out large banks at great public expense—a response which simply perpetuates the underlying problem of moral hazard. While the probability of failure can be reduced by increasing the amounts of capital they hold and by subjecting them to intense oversight, this begs the question as to whether their operations should be simplified and those banks downsized to a more manageable size.

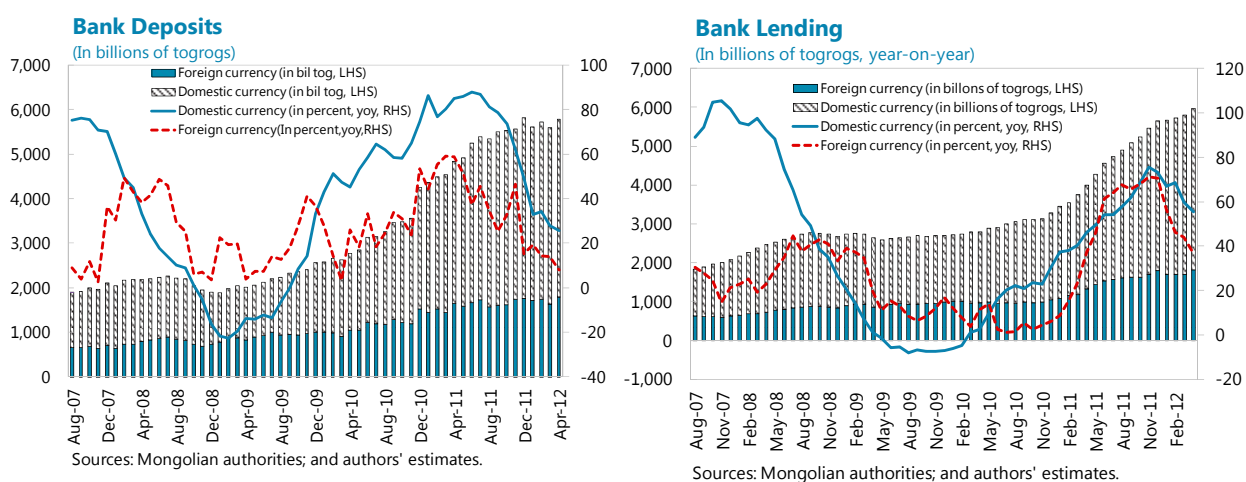
Cross-section systemic risk is inherently evolving, and should be monitored on a continuous basis. In particular, there is scope for better management of risks by:

- **Broadening the SIFI definition:** While size is a key attribute of SIFIs, the BOM is expected to also monitor interconnectedness, common exposure, substitutability and concentration, and monitor entities that fit these characteristics more closely;
- **Introducing policies that further discourage SIFIs:** Consider the possibility of building additional disincentives such as taxing the incremental size of already large institutions;
- **Strengthening the resolution regime:** To manage the failure of a SIFI in an orderly manner, improved resolution regimes should be put in place to hold down the system-wide loss that arises when such an institution fails. One important aspect is to ensure that the counterparties of an important institution are not sheltered from loss in the event of failure, so that market discipline is strengthened ex ante, which may help limit the probability of default.

## Systemic Risk from Dollarization (Yuanization)

Dollarization in Mongolia is not necessarily high by regional standards, but it adds to vulnerabilities. The share of both deposits and loans in foreign exchange is around 25-30 percent (Figure 12). Instruments to hedge foreign exchange risks (forwards, other derivatives) are lacking, making the role of foreign exchange regulations critical. Experience, elsewhere, shows that the active role of the central bank and the government is crucial in developing such instruments. Since forwards and swaps complement one another, and swaps can often be used for monetary operations, the use of swaps for monetary purposes by central banks can support the development of forwards as well.<sup>17</sup>

**Figure 12. Mongolia: Dollarization**



The BOM has in place one major prudential measure that covers many foreign exchange risks; this consists of limits on net open foreign exchange positions. Limits on financial institutions' FX open positions are set at 15 percent of capital for a single currency with an overall open position limit set at 40 percent of capital.

Beyond these rules, there appears to be limited awareness among market participants of the need to actively analyze and manage foreign exchange risk.<sup>18</sup> Given the extent of financial

<sup>17</sup>A forward market in foreign exchange is the most basic risk management tool, and is usually the first market to develop after the spot market. The development of a forward market depends on the existence of a reliable yield curve in order to price the forward rate. The existence of forward transactions, in turn, reinforces the money market, establishing a virtuous circle.

<sup>18</sup>Agents envisaging exchange rate depreciation may prefer to borrow in foreign currency, at least on a short-term basis, if they perceive that the exchange rate would not change according to expectations at least until after the loans are repaid. Thus, borrowing in foreign exchange might still be preferred even in times of increasing risk.

dollarization and the flexible exchange rate regime, foreign exchange risk remains a concern. Some regulations are still currency-blind, despite this risk.

The aim of FX regulation should not be to prohibit FX transactions, but rather should be for banks and economic agents to internalize the FX risk. The following tools may be considered:

- **Reserve Requirement:** The unremunerated reserve requirement should vary by currency, with deposits denominated in togrog carrying a lower reserve requirement than those in foreign currencies.
- **Currency-Matching Regulation:** Open positions should be calculated for different maturities, particularly to control for open positions at short maturities that may be hidden in standard aggregate measures. For this purpose, a maturity ladder should be constructed for both local and foreign currency to compare a bank's future cash inflows and outflows over a series of specified time periods. Limits could then be imposed on open positions in each period.<sup>19</sup>
- **Requirements for the provision of foreign exchange loans:** Foreign exchange loans to non-foreign exchange earners should be subject to more stringent capital requirements than loans to foreign exchange earners. In many countries, a 150 percent weight applies to such loans for calculating the capital adequacy ratio.

### C. Discretionary versus Automatic Measures

Decisions by FSC/BOM on activating macroprudential policies can be expected to encounter a lot of resistance. Pressure from the financial sector and from political actors during good times can oppose the creation of costly buffers, given strong incentives at such times to increase credit supply and short-term profits. Moreover, requirements with regard to *ex ante* risk measurement could be more demanding when discretionary measures at the individual bank level need to be justified, as opposed to the case of calibrating rules-based stabilizers that are applied across the board to all institutions.<sup>20</sup> This suggests that, to the extent possible, rather than relying on the discretionary powers of supervisors, the buildup of adequate provisions, capital reserves, and liquidity buffers in good times could be better enforced

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<sup>19</sup>A limit, of say 100 percent, on the ratio of USD denominated loans to USD denominated deposits would help to limit liquidity risk inherent to dollar lending.

<sup>20</sup>Borio and Drehmann (2009) argue that, once in place, (i) automatic stabilizers do not need continuous justification; (ii) provided they are linked to robust aspects of the financial cycle and are not too ambitious, they leave less room for error; and (iii) the corresponding measures need not track system-wide risk perfectly but just provide a rough gauge.

through credibly pre-committed rules that leave little room for supervisors to be pressured into leniency. The time-consistency argument would argue that automatic tools are better.

Pro-cyclicality could, in addition, be reduced through discretionary supervisory interventions that respond to systemic risk that varies through the cycle. For example, supervisors could ensure that banks are periodically subjected to stress tests based on updated common macroeconomic and sector-specific scenarios, as well as on early warning indicators of latent financial instability, and require each bank to adjust its risk-absorbing buffers in provisions, capital, and liquidity accordingly.

Therefore, while some automaticity is welcome, retaining the discretionary power of the FSC to deal with idiosyncratic risks is needed. The FSC should have discretionary powers to increase buffers beyond minimum regulatory standards or to limit risk exposures for individual institutions, whenever, in the judgment of supervisors, idiosyncratic risks being incurred by the institution are not adequately buffered by general regulatory requirements.

## **VI. MACROPRUDENTIAL AND MONETARY POLICIES: A CAVEAT**

How do monetary and macroprudential policies fit together? Prior to the global crisis, there was a view that a clear demarcation existed, with monetary policy focusing on a stable economy with low inflation and banking regulations addressing the soundness of individual financial institutions. There is a symbiotic relationship between financial stability and the effectiveness of monetary policy. The evolving view—though there is no consensus yet—is that monetary policy should continue to focus on inflation, as it is too blunt a tool to be used to address financial imbalances, while macroprudential tools should target systemic risk.<sup>21</sup> In addition, recent work by the IMF recommends that, when credit booms coincide with periods of general overheating, monetary policy should act first and foremost (Dell’Ariccia et al, 2012).

Price stability and financial stability are mutually reinforcing each other. Sound monetary policy is a prerequisite for financial stability. A financial system is unlikely to be stable in a volatile macroeconomic environment characterized by high inflation. Through its influence on the cost of capital, monetary policy impacts risk-taking appetite and the overall level of leverage in the economy, as well as the maturity structure of financial liabilities. Asset prices are also determined by interest rates. Similarly, financial stability also impacts the effectiveness of monetary policy. Financial instability, by creating macroeconomic volatility, makes the work of monetary policy harder to accomplish. For the monetary transmission mechanism to work effectively in Mongolia, it is imperative that banks remain healthy.

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<sup>21</sup> Assenmacher-Wesche and Gerlach (2008) have argued that it is extremely costly in terms of reductions in GDP to use monetary policy to deal with real estate bubbles, suggesting that monetary policy alone should not be used to prick real estate bubbles, as it is just too costly.



Reducing the incidence of a shock from the banking system will also help maintain price stability. Over longer horizons, price and financial stability are complementary, with no apparent trade-off.

Macroprudential policy is usually more flexible as it is better targeted at responding to credit events than monetary policy—the latter acts through its influence through economic activity and prices. Nevertheless, macroprudential policy works through similar transmission channels (balance sheet and bank lending channels) as monetary policy.<sup>22</sup> In this regard, macroprudential policy may collide with the objectives of monetary policy. Low funding costs—based on maturity transformations that fail to incorporate critical risks—may induce the adoption of risky strategies by banks, firms, and households. For instance, when macroprudential instruments are used to counteract excessive growth in credit and liquidity, it might also lead to a contraction of aggregate activity with an undesired downward pressure on prices.<sup>23</sup> Lower interest rates may sometimes be perceived by investors as a less risky environment and, hence, induce an adverse impact on the stability of the financial sector through: (i) moral hazard induced by asset substitution and procyclical leverage as banks tend to engage in risky behavior during economic expansions by easing lending requirements; and (ii) excessive credit growth and resulting asset price bubbles, in particular, when securitization activity is high. Hence, it is critical to conduct research and statistical analysis to understand the complementarities and potential conflicts between macroprudential and monetary policies.

## VII. CONCLUDING REMARKS

Mongolia's high growth trajectory is associated with very strong demand for credit. The combination of factors affecting the real economy and the banking system pose challenges for the central bank in its quest to contain inflation and maintain banking system stability. Loose fiscal policy, rising credit activity, and heightened risk appetite—attributable to the commodity boom—are fuelling price volatility in asset markets that can pose significant risks to financial stability if left unchecked. Rising interconnectedness, a potential increase in dollarization, and concentrated exposures are compounding those risks.

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<sup>22</sup> These macro-prudential instruments aim at addressing vulnerabilities regarding leverage, market risks, and interconnectedness and include changes in the use of the following tools: capital ratios, risk weights, provisioning, profit distributions, credit growth caps, loan-to-value ratios, debt service and income caps, maturity cap, margin haircut limits, valuation rules, reserve requirements (in local or foreign currency), central banks' balance sheet operations, exchange trading, capital surcharges for systematically important financial institutions, and central counterparties.

<sup>23</sup> Indeed, lower interest rates in this case might promote the buildup of financial imbalances through the risk-taking channel.

Against the backdrop of strong credit growth and fiscal expansion, there is a need to limit emerging system-wide financial risks. The BOM is enhancing the formulation of the macroprudential framework by preventing the buildup of systemic risk and constraining leverage in the banking sector, recognizing that macroprudential tools should not be a substitute for necessary fiscal and monetary policy adjustments. In particular, sound and prudent monetary policy is a prerequisite for financial stability. Through its influence on the cost of capital, monetary policy impacts risk-taking appetite and the overall level of leverage in the economy, as well as the maturity structure of financial liabilities. Maintaining the health of the banking system is imperative for the monetary transmission mechanism to work effectively in Mongolia. Reducing the risks emanating from the banking system will also help maintain price stability.

## APPENDIX. MACRO-FINANCIAL SURVEILLANCE

### Problem of Identifying Systemic Risks

Systemic oversight requires close monitoring of data and information. Measuring just how much systemic risk exists in the financial system at any particular point in time is extremely challenging.<sup>24</sup> It becomes visible when the functioning of the financial system breaks down, forcing countries to become reactive, as was the case in Mongolia when two medium-sized banks had to be rescued in 2009. To enable countries to proactively mitigate the risks from procyclicality (or rising common exposure), “ex ante” monitoring is needed to help the authorities identify the sources of systemic risk and the various channels through which these risks are propagated. Deficiencies in measuring systemic risk are, however, numerous. Advances in developing measures of risk and related risk management models had led many to believe that risks were under control. However, the global financial crisis showed that important risks that could not be measured were often being ignored. The main dimensions of the problem relate to: (i) short-sighted risk measures, driven mainly by concurrent volatility; (ii) insufficient recognition of the buildup of latent, endogenous systemic instability; and (iii) non-measurable risks (See Huang, Zhou and Zhu, 2009).<sup>25</sup> Besides the difficulty of identifying systemic risk, market prices may not always be timely indicators of actual systemic risk, particularly in periods of calm or high stress.

Instead of trying to measure systemic risk, financial stability analysis often aims to identify a set of leading indicators to convey a broad sense of how risk in the financial system is evolving. A parsimonious, but useful, set is commonly derived from the behavior of credit and asset prices (see Borio and Drehmann, 2009). In particular, there is evidence that sustained rapid credit growth combined with large increases in property prices increases the probability of an episode of financial instability. The challenge in Mongolia is to differentiate between an expansion in credit that is the corollary of a successful financial deepening program, and one that is suggestive of imprudent borrowing. A good understanding of credit—who is borrowing, how much and why—is a basic building block of macro-prudential surveillance. Similarly, an understanding of the terms of credit (e.g., length)—both in aggregate and by industry—can provide some valuable insights into the evolving risk environment.

Even more useful, but more data-intensive, are leading indicators obtained from the analysis of sectoral balance sheets: those of the household, corporate, and public sectors. By tracking debt and debt-servicing requirements over time, balance sheet analysis aims to anticipate the potential for higher levels of default should economic growth falter. Similarly, the analysis of state and local government balance sheets may also be rewarding if any doubts exist over their debt servicing capabilities and whether the central government stands behind them. This type of leading indicator

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<sup>24</sup>See IMF, BIS, FSB (2009).

<sup>25</sup>Often, when risks are identified, acting to mitigate the risk is hindered by strong political opposition.

may be more difficult to estimate in emerging market economies due to limitations in the national accounts data.

### **Early Warning Systems**

Ultimately, surveillance efforts will only be useful to policy-makers if they provide some early warning of potential problems. However, a crisis may be triggered by any number of macroeconomic, financial, or geo-political shocks—some completely unforeseen, others which are the realization of known risks. The subsequent amplification of these shocks is then dependent on systemic linkages and the existence of economic and financial vulnerabilities. This means that an increase in systemic risk may present itself as either a higher probability of a shock, or as an expansion in the number and/or size of the underlying vulnerabilities. An increase in housing prices above their “fundamental” value, for example, increases the probability of a shock in the form of a housing price “bust,” but it will be higher financial leverage on household and financial sector balance sheets that will ultimately convert the price shock into adverse real effects.<sup>26</sup>

An early warning system (EWS) needs to organize surveillance efforts so that they both identify vulnerabilities and rank them as a threat to financial stability. Although no EWS will constitute a fail-safe crisis prediction device, the use of an EWS that maps problems from different angles and drills down to the underlying issues can make a constructive contribution to the policy debate.

Except for early warning indicators (EWIs) based on an endogenous cycle perspective, existing approaches to measuring latent financial instability do not appear promising. Borio and Drehmann (2009) assess a range of measuring tools along three dimensions (Table 6): (i) the extent to which leading indicators are used, as opposed to contemporaneous indicators; (ii) the extent to which behavioral interactions that amplify systemic distress are considered; and (iii) the extent to which the approaches “tell a story” about the transmission mechanism of financial distress. Their results are summarized in Table 6 below. Borio and Drehmann conclude that the usefulness of the tools is generally limited and that the tools typically provide too little lead time for adequate remedial action. Notable exceptions are deviations from long-term trend in the credit/GDP ratio and in real estate and equity prices.

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<sup>26</sup>Risks and vulnerabilities may be different aspects of the same problem. For example, high financial leverage may have contributed to a housing bubble in the first place.

### Measuring Latent Financial Instability

Approach	(i) Leading Indicator?	(ii) Behavioral Interactions?	(iii) Does it Help to "Tell a Story"?
<b>Financial Soundness Indicators (FSIs) or related indices</b>	No. Backward looking or contemporaneous.	No	No
<b>Credit ratings</b>	Forward looking in theory, downgrades "sticky" in practice.	No	No
<b>Market price-based indicators</b>	Narrow coverage. Market biases embedded. Lead too short for policy action.	No	No
<b>Early warning indicators (EWIs)</b> [Most promising: those drawing on endogenous cycle perspective]	Good EWIs: deviations from long-term trend in credit/GDP and in deflated real estate and equity prices.	Can help identify interactions among risk factors and suggest system-endogenous effects.	Can help frame broad stories.
<b>Single-module measures: VaRs</b>	Can provide forecasts of financial distress. But unable to incorporate boom-bust cycles.	Take into account feedback effects and can trace shock propagation. But macro-financial linkages are poorly	Lack of structure, and too simplistic. Little to say about the dynamics of distress.
<b>Multiple-module measures: Macro stress tests</b>	Explicitly forward-looking, can cover a broad range of scenarios. But failed to anticipate the recent turmoil.	Can trace shock propagation. Do not capture systemic-endogenous instability.	Much more structure and granularity. Helpful for storytelling and communicating concerns.

Source: Authors' compilation based on Borio and Drehmann (2009).

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