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THE M1-M2 GROWTH DIVERGENCE IN MAINLAND CHINA: WHAT DOES IT TELL US?

Key points:

- *The rapid expansion in M1 accompanied by the slowdown in M2 growth in Mainland China since 2016 has raised some concerns over the effectiveness of monetary policy, and some commentators even suggested that the Mainland economy was likely entering a liquidity trap.*

- *This analysis first formally tests the liquidity trap hypothesis and finds little support for the view that the Mainland economy might have been entering a liquidity trap. Our results suggest that there is no quick surge in the interest elasticity of money demand despite the sharp fall in lending rates after 2015, contrary to the liquidity trap hypothesis. In this sense, sustained monetary expansion, if needed, would still be effective in shoring up economic activities in Mainland China.*

- *In the next step, this analysis investigates what exactly might have accounted for the much faster growth of M1 than M2 if not the liquidity trap. Our findings suggest that while recent monetary easing in part accounted for the much faster growth of M1 than M2, increased economic uncertainty appeared to have also played an important role through driving up precautionary demand for money and holding off investment. By contrast, recent economic slowdown and expansion in shadow banking activities appeared to have resulted in slower, rather than faster growth of M1 than M2.*

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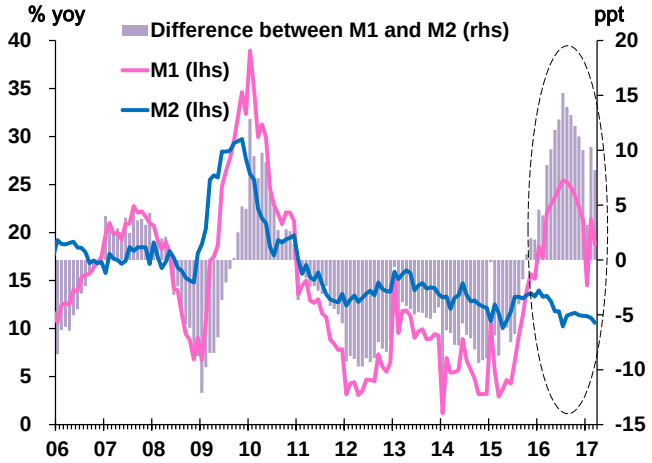
I. INTRODUCTION

Historically, M1 and M2 usually moved in the same direction in Mainland China, despite the fact that the growth rate of M1 was more volatile. However, 2016 saw M1 growth accelerate from around 15% year on year to as high as 25.4% in July 2016, while M2 growth, in contrast, declined from 13.3% to 11.3% during the same period. The divergence between M1-M2 growth narrowed slightly but remained substantial in the first quarter of 2017 (Chart 1).

Chart 1: Growth of M1 and M2 in Mainland China



Sources: CEIC and staff estimates.

The fact that the rapid expansion in M1 was not accompanied by fast growth of M2 has raised some concerns over the effectiveness of monetary policy, and some commentators even suggested that the Mainland economy was likely entering a liquidity trap, as such divergence in M1 and M2 growth might have been driven by a quick accumulation of idle funds due to a lack of investment opportunities amid the economic slowdown.

Understanding the recent M1-M2 growth divergence is important. For instance, if indeed the recent M1-M2 growth divergence reflected the existence of a liquidity trap, then monetary policy would be ineffective and the Mainland authorities may need to rely more on other measures such as fiscal stimulus to support the economy.

To this end, this analysis formally tests the liquidity trap hypothesis first, given that the much faster growth of M1 than M2 itself may not be a straightforward indicator for whether a liquidity trap exists. In the next step, this analysis investigates what exactly may explain the much faster

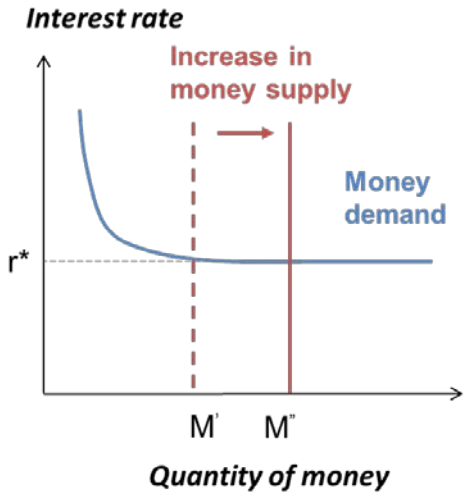
growth of M1 than M2 and discusses whether such divergence should be a concern.

II. Liquidity Trap in Mainland China: From Theory to Evidence

2.1 Liquidity trap: definition and debate on the Chinese case

Although there is no clear-cut definition of a liquidity trap, related discussion typically focuses on the situation where monetary policy is no longer able to further lower real or nominal interest rates and thus loses grip on the economy[1]. Under such circumstances, interest rates are at low levels or close to zero and money demand becomes very elastic. Therefore any further increase in money supply will be hoarded so that the interest rate cannot be further lowered to stimulate the economy (Chart 2).

Chart 2: An illustration of money demand and supply in a liquidity trap



On whether the Chinese economy is entering a liquidity trap, the debate is often polarized between two points of view. Focusing on the effectiveness of monetary policy, one strand of thought argues that the Chinese economy is likely mired in a liquidity trap as monetary easing in China seems to have less apparent impact on the real activities, especially in view of a quick surge in narrow money (M1) growth together with the

[1] Keynes (1936) in his General Theory noted the possibility that after the rate of interest has fallen to a certain level, liquidity-preference may become virtually absolute, and the monetary authority would have lost effective control over the rate of interest. More recent theorist such as Krugman (1998) defined liquidity trap as a situation in which conventional monetary policies have become impotent, because nominal interest rates are at or near zero.

slowdown in broad money (M2) growth, a sign of a quick accumulation of idle funds. The other however holds the opposite view, judging from the level of interest rates in Mainland China. Currently, the effective lending rate remains high at above 5%, though has been coming down from higher levels since early 2015.

2.2 Empirical framework and evidence

One way to evaluate the relevance of the liquidity trap hypothesis is to examine directly whether the demand for money actually becomes more elastic in tandem with the fall in interest rates. Following Hondroyiannis et al (2000), in this analysis we estimate the interest elasticity of money demand in Mainland China using the following equation,

$$ln(MD_t) = \beta_0 + \beta_1\, ln(r_t) + \beta_2\, ln(Y_t) + u_t, \qquad (1)$$

where MD_t is the money demand and r_t is prevailing market interest rates. β_1, the coefficient of interest rates therefore captures the interest elasticity of money demand. If the Mainland economy is indeed in a liquidity trap, we should observe a quick surge in the interest elasticity of money demand in tandem with the fall in interest rates. Apart from interest rates, income levels may also affect money demand. Specifically, other things being equal, higher levels of income may lead to greater demand for money. Therefore Y_t, the level of GDP, a proxy for income, is also included into the specification (more details please refer to Annex 1).

Using monthly data during the period of January 2005 to September 2016, our estimation results of the benchmark regression suggest that money demand, proxied by M2 or aggregate financing[2], in general increases when interest rates decline, as shown by the negative coefficients of varied interest rates (Table 1). The income elasticity of money demand is found to be positive and slightly above unity, as suggested by the coefficients of GDP. These findings remain robust when some controlling variables are included in the specification, such as economic uncertainty and the reserve requirement ratio (RRR) (Table A1.A in Annex 1).

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[2] M2 is a commonly used proxy for money demand in literature. In the case of Mainland economy, we also use aggregate financing as a proxy.

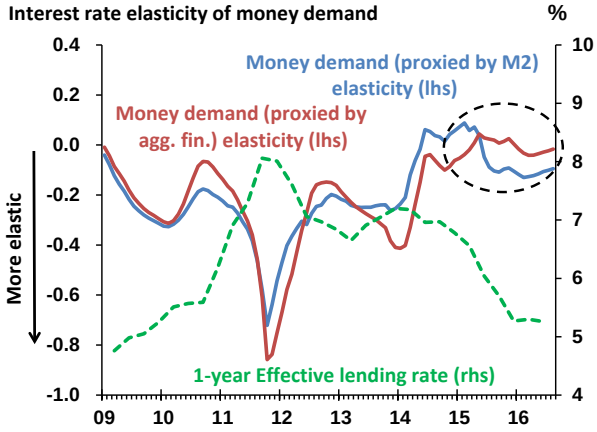
Table 1: Income and interest elasticities of money demand in Mainland China: 2005/01－2016/09

	(a)	(b)	(c)	(d)	(e)	(f)
Dependent variable:	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**
Explanatory variables:						
GDP	1.176***	1.381***	1.163***	1.363***	1.224***	1.425***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Interest rates						
Estimated 1-year effective lending rate	-0.271***	-0.286***				
	(.000)	(.000)				
1-year benchmark lending rate			-0.306***	-0.358***		
			(.000)	(.000)		
7-day repo rate					-0.059***	-0.051
					(.009)	(.149)
Constant	-0.796***	-3.054***	-0.633***	-2.784***	-1.759***	-4.017***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
R-squared	.996	.992	.997	.994	.994	.990
No. of observations	141	141	141	141	141	141

Note: Monthly estimates of GDP are based on quarterly GDP, GDP shares of investment, consumption and net exports, as well as monthly data on fixed asset investment (FAI), retail sales and trade balance. The estimated 1-year effective lending rate is calculated based on the 1-year benchmark lending rate and the shares of loans extended at the rate below or above the benchmark lending rate during the month. The Newey-West standard errors are calculated and P-values are reported in parenthesis. ***, ** and * denote that the estimated coefficients are significant at 1%, 5% and 10% levels respectively.

Further study on the time profile of the interest elasticity of money demand using a rolling window analysis suggests that there is little evidence for the view that the Mainland economy is entering a liquidity trap. More specifically, contrary to the liquidity trap hypothesis, our results find no quick surge in the interest elasticity of money demand despite the effective lending rate having declined notably after 2015 (Chart 3). Following the interest rate decline, money demand indeed became slightly more elastic but remained much less elastic than in previous episodes. Our findings of no quick surge in the interest elasticity of money demand during recent periods appear to be robust irrespective of the choices of interest rates and different rolling windows (Chart A1.A in Annex 1).

Chart 3: The dynamics of interest elasticity of money demand based on a rolling window analysis



Note: Interest elasticity of money demand is estimated by a 36-month rolling window during the period of 2005/01－2016/09.

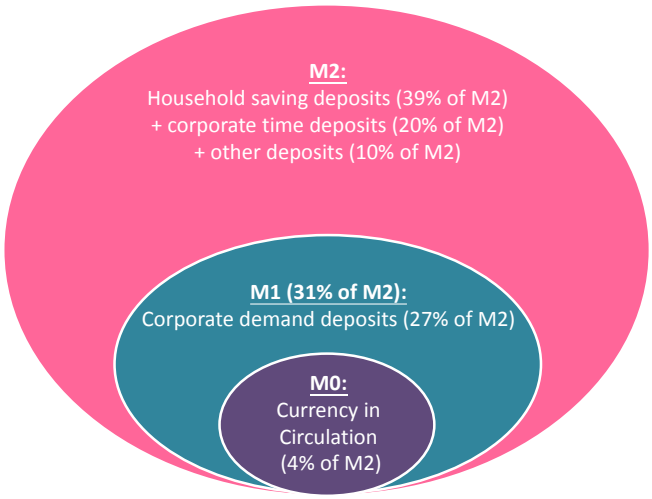
III. WHAT EXPLAINS THE M1-M2 GROWTH DIVERGENCE IF NOT THE LIQUIDITY TRAP?

In the previous section, we have shown that there is no evidence for the view that the Mainland economy is entering a liquidity trap. This section thus investigates what could be the potential factors driving the much faster growth of M1 than M2 and discusses whether such divergence should be a concern.

3.1 Definition of M1 and M2 in Mainland China

According to the official definition by the PBoC, M1 in Mainland China consists mainly of currency in circulation (also known as M0) and corporate demand deposits (Chart 4), which are usually perceived as money held for transactions and precautionary purposes. M2 is a broader measure of money, which includes a wider set of deposits, such as corporate time deposits, household saving deposits, as well as deposits of non-depository financial institutions, in addition to M1. Time deposits are usually held for investment/speculation purposes and receive higher interest rates than demand deposits.

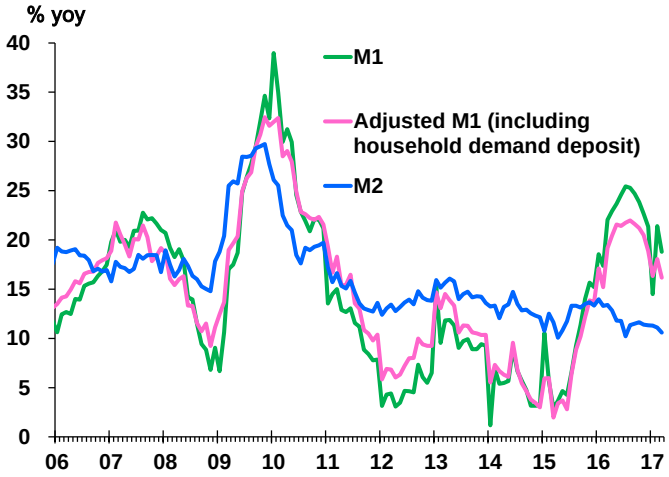
Chart 4: Definition of money supply in Mainland China



Sources: CEIC and staff estimates.

Unlike conventionally defined narrow money, M1 in Mainland China does not include demand deposits from households. Instead, household demand deposits are included in household saving deposits as part of M2. That said, adding back household demand deposits into M1 does not appear to change too much the growth pattern of narrow money, though making it slightly less volatile (Chart 5). This may reflect the fact that the demand of household and corporate for the liquid form of money such as demand deposits tends to be affected by similar macro-economic and structural factors.

Chart 5: M1 and M2 growth in Mainland China



Sources: CEIC and staff estimates.

3.2 Potential factors affecting M1 and M2 growth: what does economic theory tells us?

Various factors may affect the demand for money and thus the growth rates of M1 and M2. First, demand for money, especially M1, tends to increase with higher level of output. As money is used as a medium of exchange, or as a means of payment, higher income or levels of economic activities may lead to greater need of people to hold the most liquid form of money, for instance, cash or money in the checking account, to facilitate transactions or payment. Due to the strong correlation between money demand and economic growth, rising M1 growth is sometimes perceived as an early sign of improvement in economic activities.

Second, demand for money can also be affected by interest rates. When interest rates become lower, time deposits will receive less return and the opportunity cost of holding the liquid form of money will decrease. Therefore, people may have incentives to hold more money in their checking accounts. In this sense, declines in interest rate usually lead to higher M1 growth.

On the other hand, lower interest rates could result in lower demand for time deposits, which is another important component of M2, than demand deposits. Specifically, since changes in interest rates may also affect investment returns, people may be willing to move money out of their saving account into bonds or other interest-sensitive assets whose value will increase amid declines in interest rates. Therefore, declines in interest rates tend to have positive but relatively smaller overall impact on M2 growth than M1 growth.

Third, precautionary motive for holding money will become stronger amid greater uncertainties, resulting in faster growth of M1. Typically, people tend to increase their holding of precautionary liquidity for emergency expenses if the economic outlook becomes unpredictable. For companies, rising levels of economic uncertainty may discourage investment and in turn result in the piling up of idle funds on their balance sheets.

Apart from the above mentioned macro-economic factors, structural changes in the financial system may also affect M1 and M2 growth. For instance, the fast development of shadow banking activities in the Mainland China may lengthen the financial intermediation chain and thus slow down money creation. In addition, the introduction of new technologies improving conversion between checking and saving accounts or provides liquidity such as credit cards and online/WeChat payments may also reduce the transaction demand for money.

3.3 Estimating the determinants of M1 and M2 growth in Mainland China

While in theory M1 and M2 growth can be affected differently by various factors as discussed, which factors actually played the role in driving the M1 and M2 growth divergence in recent periods in Mainland China is an empirical question. To this end, we estimate the demand equation for real M1 and M2 growth separately using the same set of explanatory variables. In particular, we extend the difference form of Equation (1) into the following

$$\Delta MD_t = \beta_3 + \beta_4 \Delta Y_t + \beta_5 \Delta r_t + \beta_6 Uncertainty_t + \beta_7 Shadow\ Banking_t + \varepsilon_t \quad (2),$$

where ΔMD_t is the year-on-year growth of real money supply, ΔY_t is the year-on-year growth of real GDP, Δr_t is the year-on-year difference of the benchmark 1-year lending rate. To take into account the impact of economic uncertainty, we include a normalised news-based economic uncertainty index, $Uncertainty_t$, for Mainland China into the specification.[3] In addition, the impact of shadow banking activities is also considered, with, $Shadow\ Banking_t$, the ratio of the outstanding size of shadow banking activities to the outstanding size of bank loans being added to the specification.[4]

Due to data limitation, other structural factors such as the penetration of credit card usage and online/WeChat payments in Mainland China are not included into the specification. As online/WeChat payments

[3] To proxy for economic uncertainty, we use the economic policy uncertainty (EPU) index for Mainland China developed by Baker, S.R., Bloom, N. and Davis, S.J., which captures the percentage of economic news reports related to Mainland China in a major new paper through a text keyword filter (source: http://www.policyuncertainty.com/china_monthly.html). Similar news-based EPU indices on other economies developed by the team appeared in many recent studies including those by the ECB and the IMF.

[4] Shadow banking activities include entrusted loans, trust loans and entrusted funds managed by securities firms.

expanded particular fast in recent episodes, which might have in turn decreased rather than increased the transaction demand for money, they are unlikely to be the reason behind the recent faster growth M1 than M2. That said, omitting these factors in our study may result in biased estimates of the coefficients of the individual money demand equations. However, such problem is less of a concern when it comes to explaining the recent M1-M2 divergence, where the differences of the estimated coefficients in the individual money demand equations matter.

Following the conventional definition of M1, in addition we also estimated the demand equation of adjusted real M1 growth, which takes into account household demand deposits in addition to currency in circulation and corporate demand deposits. In this analysis, we estimate the money demand equations using quarterly data over the period of Q1 2006 – Q3 2016.

The implied cumulative effects of these explanatory variables based on our regression results are summarised in Table 2 (more details please refer to Annex 2). Our findings suggest that while the cumulative effects of GDP growth on M1, adjusted M1 and M2 growth are all statistically positive, the effect on M1 and adjusted M1 growth is much larger. These findings are in line with theoretical expectations, as the transaction demand for money is much more relevant for the most liquid form of money, and the impact of economic growth on time deposits is less pronounced. Similarly, interest rate changes are found to have a significant and negative effect on M1, adjusted M1 and M2 growth, with M1 and adjusted M1 growth appearing to be more sensitive to interest rate changes, in line with what we discussed in the previous section.

Table 2: Cumulative effects of a one unit change of explanatory variables on real M1 and M2 growth

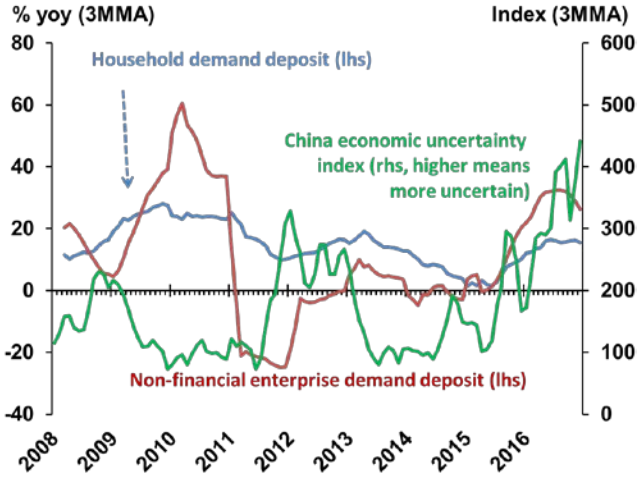
Explanatory variable	**Real M1 (%yoy)**	**Adjusted real M1 (%yoy)**	**Real M2 (%yoy)**
Real GDP (%yoy)	2.026**	1.535**	0.937**
Interest rate (%)	-12.153***	-11.674***	-5.529***
Economic uncertainty (normalised, per standard deviation)	2.973**	2.614***	-0.181
Share of shadow banking (%)	-0.266*	-0.412***	-0.257**

Notes: ***, ** and * denote the original estimated coefficients are significant at 1%, 5% and 10% levels respectively.

Economic uncertainty appears to have a positive and statistically significant impact on both M1 and adjusted M1 growth but not for M2 growth, suggesting that higher economic uncertainty tends to be

associated with higher precautionary demand for money or a fast accumulation of the idle funds on corporate balance sheets. Indeed, the growth of household and enterprise demand deposits seemed to have strong correlation with the economic uncertainty index, especially after 2011 (Chart 6).

Chart 6: Growth of household and enterprise demand deposits and economic uncertainty



Sources: CEIC, China Economic Policy Uncertainty Index (source: http://www.policyuncertainty.com/china_monthly.html) and staff estimates.

In comparison, growth rates of M1 and M2 are found to have similar negative correlations with the relative size of shadow banking activities to bank lending. This suggests that while shadow banking activities may have slowed down money growth in Mainland China, they may not necessarily be a key reason for the recent M1-M2 growth divergence.

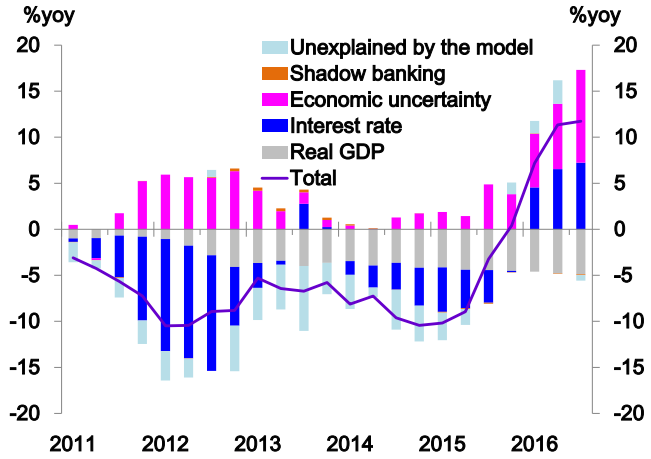
It is worth noting that shadow banking activities appeared to have larger negative impact on adjusted M1 growth than on M1 growth. This may be because the substitution effect is much stronger between shadow banking products such as wealth management products and household demand deposits than between these shadow banking products and corporate demand deposits[5].

Based on our estimation results, we disentangle the contributions of different factors to the growth divergence between M1 and

[5] For instance, latest official data suggests that above 50% of newly issued wealth management products were with maturity equal or below 3 months. Source: www.chinawealth.com.cn

M2.[6] Not surprisingly, interest rate declines have been one of the main reasons for the much faster growth of M1 than M2 since 2016 (Chart 7).

Chart 7: Contribution to the differences in M1-M2 growth



Sources: CEIC, China Economic Policy Uncertainty Index (source: http://www.policyuncertainty.com/china_monthly.html) and staff estimates.

Unlike some market claims that the divergence between M1 and M2 growth is due to lack of investment opportunities amid economic slowdown, our findings do not lend support to this view. Instead, recent economic slowdown resulted in much slower growth of M1due to lower transaction demand for money. In fact, it is economic uncertainty, rather than the economic slowdown itself, that is found to be the other important factor driving the divergence of M1-M2 growth. In particular, our findings indicate that the contribution of economic uncertainty to the M1-M2 growth differential in recent periods was almost comparable to that of interest rate declines.

IV. CONCLUSION

The results presented in this analysis find little support for the view that the Mainland economy might have been entering a liquidity trap. Specifically, the results suggest that there is no quick surge in the interest elasticity of money demand despite the sharp fall in lending rates after 2015, contrary to the liquidity trap hypothesis. In this sense, sustained monetary expansion, if needed, would still be effective in shoring up economic

[6] We take end-2010, when growth of M1 and M2 were largely similar, as a base period, and estimate the effects of each explanatory factor on the difference between M1 and M2 growth relative to the base period.

activities in Mainland China.

Our analysis documents that while recent monetary easing in part accounted for the much faster growth of M1 than M2, increased economic uncertainty appeared to have also played an important role through driving up precautionary demand for money and holding off investment. In this sense, our study highlights the important role of economic uncertainty played in shaping money demand in Mainland China in recent periods. By contrast, recent economic slowdown and expansion in shadow banking activities appeared to have resulted in slower, rather than faster growth of M1 than M2.

Annex 1: Test the liquidity trap hypothesis using Mainland data

In our test of the liquidity trap hypothesis, we use two proxies to capture money demand in Mainland China. The first one is M2, which is commonly used in the literature. The second one is aggregate financing, which measures money demand in a broader sense given the recent development of shadow banking activities.

To make sure that our results are not driven by the choice of certain interest rates, we employ a wide range of interest rates in our estimation including, interbank lending rates (the 7-day repo rate), end user borrowing rates (the effective lending rate), and the policy rates (1-year benchmark lending rate). In addition to the benchmark regression, in the robustness test we also include some controlling variables in the specification, such as uncertainty in economic and monetary policy and the Required Reserve Ratio (RRR), which may possibly affect money demand.

All variables in this test are monthly data expect for GDP and the effective lending rate. We therefore extrapolate the monthly estimates of GDP by splitting quarterly GDP into months based on quarterly figures of consumption, investment and net exports, and monthly figures of retail sales (*Retail*), fixed asset investment (*FAI*) and trade balance (*TB*) as follow:

$$GDP_{Mi} = Consumpiton_Q * \frac{Retail_{Mi}}{Retail_Q} + Investment_Q * \frac{FAI_{Mi}}{FAI_Q} + Net\ Exports_Q * \frac{TB_{Mi}}{TB_Q}$$

where $i = 1,2$ or 3 representing the first, second or third month in the respective quarter. Meanwhile, the monthly effective lending rate is estimated based on the shares of actual lending rates that are below or above the benchmark lending rate, which are published by the PBoC every month.

As shown in Table 1, all the variables are in their expected signs with higher income and lower interest rate yielding higher money demand. They are also statistically significant except for the case of 7-day repo on aggregate financing. Table A1.A represents the results with the economic policy uncertainty index and RRR added to the specification. Our findings of negative impacts of interest rates on money demand remain robust after the introduction of the uncertainty index.

While the RRR *per se* may not have a direct effect on money

demand, changes in the RRR may signal the changes in monetary policy stance and in turn may affect money demand through the channel of market expectations. In the Mainland case, inclusion of the RRR in the regression seems to take away the negative impacts of some interest rates on money demand such as the 7-day repo rate.

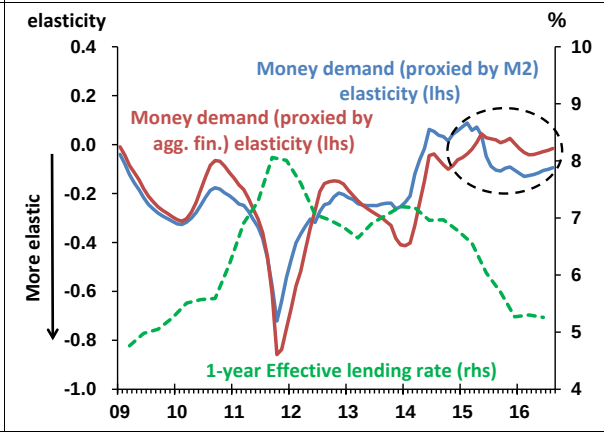
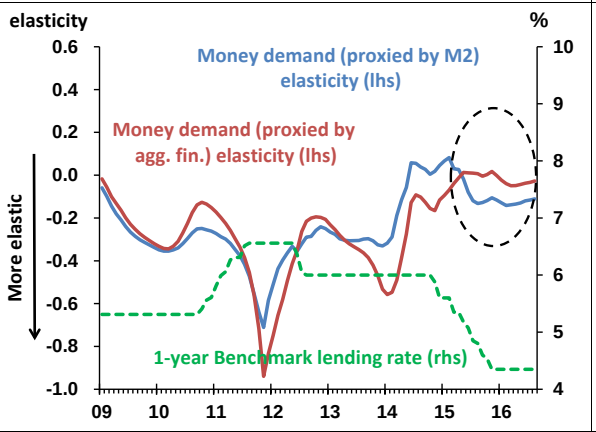
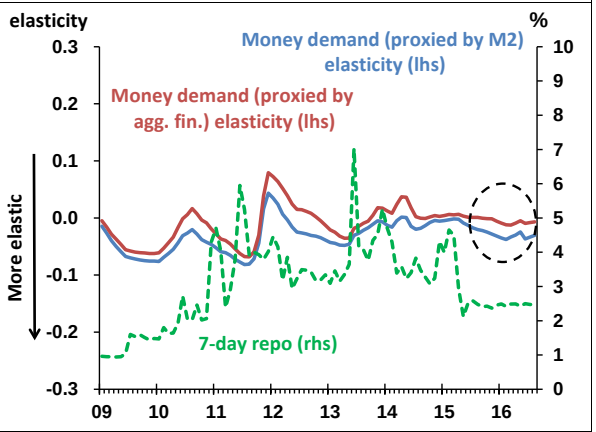
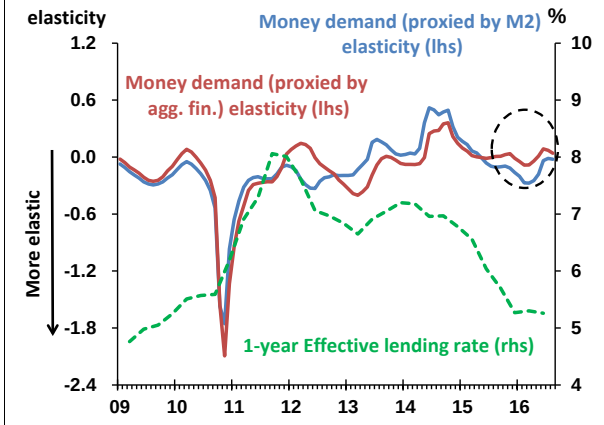
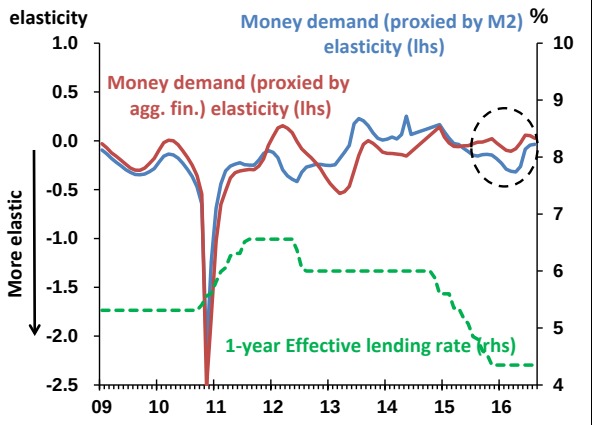
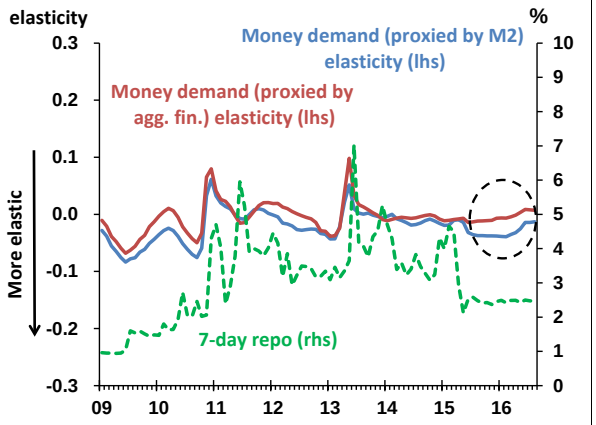
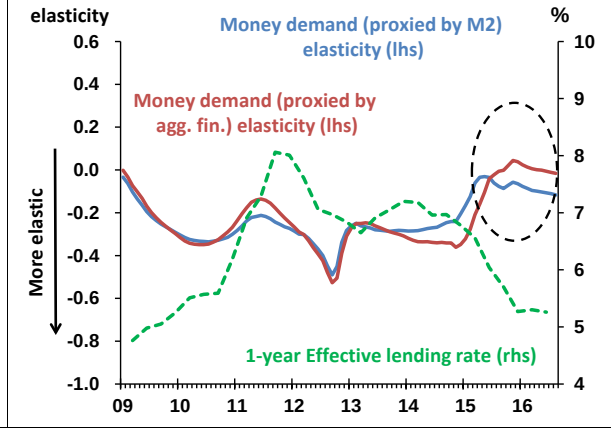
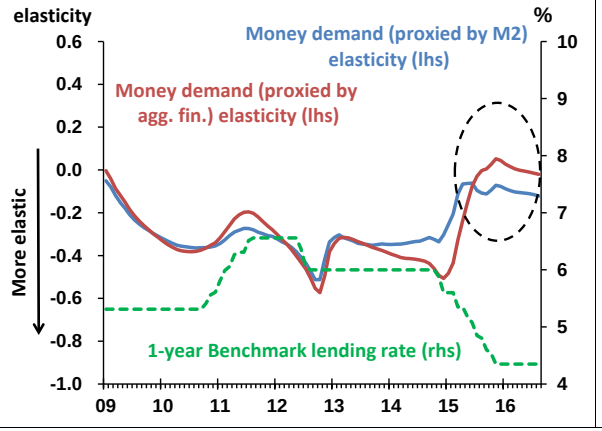
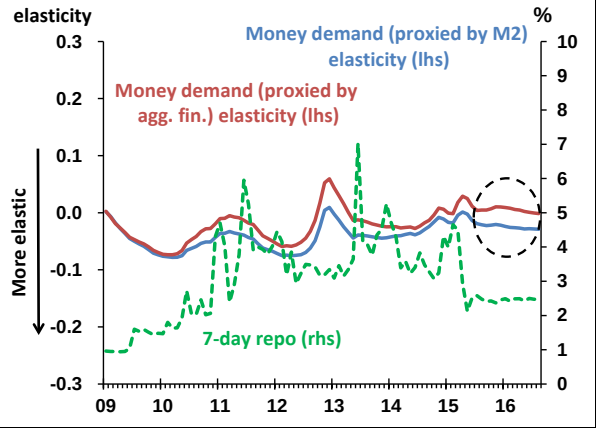
Table A1.A: Income and interest elasticities of money demand in Mainland China controlling for economic uncertainty and the RRR: 2005/01－2016/09

	(a1)	(b1)	(c1)	(d1)	(e1)	(f1)	(a2)	(b2)	(c2)	(d2)	(e2)	(f2)
Dependent variable:	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**	**M2**	**Agg. Fin**
Explanatory variables:												
GDP	1.188***	1.402***	1.175***	1.386***	1.239***	1.451***	1.301***	1.554***	1.258***	1.489***	1.342***	1.58***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
Interest rates												
Estimated 1-year effective lending rate	-0.277***	-0.297***					-0.115*	-0.070				
	(.000)	(.000)					(.068)	(.492)				
1-year benchmark lending rate			-0.312***	-0.370***					-0.177***	-0.189*		
			(.000)	(.000)					(.002)	(.086)		
7-day repo rate					-0.063***	-0.058*					-0.018	0.003
					(.003)	(.092)					(.238)	(.912)
Uncertainty												
Economic policy uncertainty index	-0.009	-0.017**	-0.010**	-0.018***	-0.010	-0.017*						
	(.121)	(.041)	(.038)	(.008)	(.193)	(.093)						
Signaling effect												
Required Reserve Ratio							-0.014***	-0.019***	-0.010***	-0.013**	-0.017***	-0.022***
							(.000)	(.002)	(.006)	(.048)	(.000)	(.000)
Constant	-0.907***	-3.255***	-0.751***	-2.995***	-1.915***	-4.280***	-2.198***	-4.997***	-1.713***	-4.209***	-2.779***	-5.367***
	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)	(.000)
R-squared	.996	.993	.998	.995	.994	.992	.998	.995	.998	.995	.997	.995
No. of observations	141	141	141	141	141	141	141	141	141	141	141	141

Note: The Newey-West HAC-robust standard errors are calculated and P-values are reported in parenthesis. ***, ** and * denote that the estimated coefficients are significant at 1%, 5% and 10% levels respectively.

To study the time profile of interest rate elasticity, Equation (1) is re-estimated under the rolling windows of 24, 36 and 48 months respectively. Chart A1.A shows the estimated interest rate elasticity of money demand by different window sizes and different interest rates. Contrary to the liquidity trap hypothesis, Chart A1.A suggests there was no quick surge in the interest elasticity of money demand despite notable decreases in interest rates. Following interest rate declines, money demand indeed became slightly more elastic in some cases but remained much less elastic than in previous episodes.

Chart A1.A: Estimated interest rate elasticity of money demand by window size and by interest rate type

	Estimated 1-year effective lending rate	1-year benchmark lending rate	7-day repo rate
36 months			
24 months			
48 months			

Annex 2: Estimate M1 and M2 growth in Mainland China

In our estimation of Equation (2), the lag orders of the independent variables are chosen based on the specification that best fits the model. To adjust for the autocorrelation problem, we include a lag dependent variable for real M1 growth and adjusted real M1 growth regression, while an AR(1) is included in the regression for real M2 growth. The estimation results are reported in Table A2.A:

Table A2.A: Estimation results for money demand equation

	Real M1 growth (%yoy)		**Adjusted real M1 growth (%yoy)**		**Real M2 growth (%yoy)**	
Explanatory variable	Lag order	(1)	Lag order	(2)	Lag order	(3)
Real GDP (%yoy)	t-1	0.980**	t-2	0.727**	t	0.937**
		(.028)		(.033)		(.013)
Interest rate (%)	t-1	-5.879***	t-1	-5.528***	t	-5.529***
		(.000)		(.000)		(.000)
Economic uncertainty (normalised, per standard deviation)	t	1.438**	t	1.238***	t	-0.181
		(.024)		(.002)		(.631)
Share of shadow banking (%)	t	-0.129*	t	-0.195***	t	-0.257**
		(.052)		(.003)		(.021)
Intercept		-3.219		0.124		8.336*
		(.420)		(.971)		(.059)
Lag dependent variable	t-1	0.538***	t-1	0.550***		
		(.000)		(.000)		
AR(1)						0.702***
						(.000)
R-squared		0.941		0.944		0.931
No. of observations		43		43		43

Notes: ***, ** and * denote that the estimated coefficients are significant at 1%, 5% and 10% levels respectively.

Since the results in Table A2.A present only the short-run elasticity rather than the long-run propensity brought by the lag dependent variable in the real M1 growth and adjusted real M1 growth regressions, we also need to calculate the cumulative effects of the independent variables. To do so, we expand the dynamic form of Equation (2) as follows.

$$\begin{aligned}\Delta MD_t &= \beta_3 + \beta_4 \Delta Y_t + \beta_5 \Delta r_t + \beta_6 Uncertainty_t + \beta_7 Shadow\ Banking_t + \beta_8 \Delta MD_{t-1} \\ &\quad + \varepsilon_t \\ &= \beta_3 + \beta_4 \Delta Y_t + \beta_5 \Delta r_t + \beta_6 Uncertainty_t + \beta_7 Shadow\ Banking_t + \beta_3 + \beta_8 * (\beta_4 \Delta Y_{t-1} \\ &\quad + \beta_5 \Delta r_{t-1} + \beta_6 Uncertainty_{t-1} + \beta_7 Shadow\ Banking_{t-1} + \beta_8 \Delta MD_{t-2} \\ &\quad + \varepsilon_{t-1}) + \varepsilon_t\end{aligned}$$

From the above transformation, we can see that the cumulative impact of a one unit change in GDP_t for five quarters is equal to $\beta_4(1 + \beta_8 + \beta_8^2 + \beta_8^3 + \beta_8^4)$. Table 2 reports the estimated cumulative effects of the independent variables on real money growth up to five quarters.

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