# An Empirical Analysis of the impact of the Development e-money on the Capital Markets in China

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*ABSTRACT*

*Electronic money has garnered significant interest in recent years. It is the newest payment instrument. Due to its role in the new electronic payment system, professionals, quiz both its implications in advancing the development of banking functions and the overall economy. The study seeks to understand the real effects of e-money, monetary authorities place them in a better chance of forming the appropriate legislature to regulate the e-money environment. This will aid monetary authorities in the exercise of rightly positioning e-money among money components. The study employs the autoregressive distributed lag model using quarterly data from the period 2011 to 2021 in China to explore the effects of e-money on monetary policy and track transmission through money supply to capital markets. The study finds that e-money services have a notable contribution to monetary conditions and interest rates. Their operations are contributing heavily to the monetary aggregates, they have the potential to maneuver interest rate also as monetary aggregates and interest rates are closely related.*

***KEYWORD:*** *e-money, capital markets, monetary policy*

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**Introduction**

Electronic money has garnered significant interest in recent years. It is the newest payment instrument. Due to its role in the new electronic payment system, professionals, quiz both its implications in advancing the development of banking functions and the overall economy. E-money carries the potential to take over from cash as the primary means of making small value payments (Al-Laham, Al-Tarawneh, & Abdallat, 2009). This is seen to make the inherent transaction both easier and cost effective for consumers and merchants. E-money stands as a record of the funds available to a consumer on an electronic device in his possession. This can be in the form of a prepaid card, a digital or computer device.

In more recent times, however, e-money has grown into popularity quite significantly. This has primarily been inspired by the growth and improvement of computer technology (Qin, 2017). Businesses are now more and more hinging their operational efficiency on network-based platforms. Beyond just marketing and product development, businesses even use electronic means of making transactions. For security and convenience reasons, individuals are also moving from the adage of cash exchanges to electronic payment systems as well. Furthermore, banks are also gaining ground in the proliferation of online services (Qin, 2017). Therefore, e-money adoption is rapidly becoming adopted with each day.

Another factor opposing the existence of e-money is the strong competition from the debit/ credit cards. The possible influence of e-money on the monetary policy is also a topic of professional interest overall. E -money has the potential to substitute currency in circulation, which is part of the monetary aggregates from the balance sheet of central banks. Now, the influence is not significant - central banks are recording very low decrease of currency in circulation as a result of increase of e-money (Popovska-Kamnar, 2014). But still, having in mind that any innovation takes time to be accepted on the market, in the future central banks and experts need to follow the developments surrounding e-money more closely and more carefully (Popovska-Kamnar, 2014).

Money supply is a key instrument for monetary policy. The role of a central bank is to effectively use control mechanisms at its disposal to protect the real economy. One such tool is the monetary policy. This transmission through monetary policy is often known to find its way to capital markets, particularly its effects on stock market prices (Chen & Xie, 2016). Changes in money supply are known to closely be associated to changes in interest rates. Interest rates integral to the pricing and performance of stocks,

Shares worth exorbitant amounts of money are bought and sold everyday on stock markets. The strong performance of these capital markets is essential as economies, businesses and ultimately the livelihoods of many individuals are tied, directly or indirectly, to these markets. Throughout history, capital market collapses

have subjected livelihoods to major disturbances while their strong performances have yielded positive influences on real activities such as investment and consumption (Pesaran, Shin, & Smith, 2001).

Countries with developed capital markets are known to substantially attract investment. This investment brings with it significant transfer of human capital and technological innovation. These are essential for sustainable economic growth and development. Furthermore, the essence of capital markets lies in the fact that sustainable economic growth relies on resources of which no banking nor public sector can provide for on its own. Hence, capital markets facilitate the funding for such resources (Susan & Djajadikerta, 2020; Ben, Miguel, & Gerald, 2014).

Therefore, it is the view of this study that the development and rapid adoption of e-money will have substantial implications for capital markets via its role in affecting money supply (Heryadi, Azwardi, & Sukanto, 2020). Though a relatively fresh medium of exchange, facilitated by widely accessed and used platform, e-money is here to stay, and it is growing. Unmonitored, e-money can easily dictate the functioning of banking sectors with serious ramifications on capital markets and the real economy (Mohamadpour, Behravan, Espahbodi, & Karimi, 2012).

There is an increase in the uptake and development of e-money. Due to the relative novelty of the concept of e-money, its position and relationships in the banking sector or capital markets are not aptly documented in economic or financial literature. This opens up the banking sector and money supply subject to risks associated with unknown cycles inherent to the e-money system. The effects of which are essential to the performance of capital markets. It is therefore an important exercise to trace the transmission of changes and volatilities from e-money through the central banks' monetary system to the capital markets (Al-Laham, Al-Tarawneh, & Abdallat, 2009).

This study is significant as it will aid monetary authorities in the exercise of rightly positioning e-money among money components. In understanding the real effects of e-money, monetary authorities stand a better chance of forming the appropriate legislature to regulate the e-money environment. Furthermore, central banks will be able to synchronise e-money activities with central bank strategies to facilitate for enhanced performance of capital markets.

Additionally, this study contributes to the dearth of literature assessing the relationships between e-money and the real economy in China. Beyond just controlling for sinister activities associated with e-money, authorities can use such literature to optimise such an instrument to improve capital market conditions in the country.

**Research objectives**

- To assess the impacts of e-money on capital markets in China.
- To assess e-money and its impact on the monetary system in China
- To assess how the effect gets transferred to capital markets China
- Finally advise policy on strategies of optimising e-money trends for improved capital market conditions.

**Literature Review**

E-money raises money supply through the money multiplier (Popescu & Popescu, 2019; Supriya, 1999) . Although e-money will influence the total money supply through base money and the money multiplier, the central bank can reduce various impacts of e-money on the money supply through the adjustment of the interest rate level and reserve ratio (Friedman, 2010). Moreover, due to the different influences of e-money issued by different money-issuing subjects on the money supply, it is also difficult for the central bank to supervise them (Griffith, 2012).

Mainly, the impact of electronic money on the money demand is mainly reflected in Two aspects: one is the speed of money circulation, and the other is currency substitution. From the perspective of monetary velocity, the influence of electronic money on monetary velocity is complex, and is not only rising or falling, but a combination of various situations (Rangeley, 2018). Electronic money can accelerate the velocity of money circulation by influencing the central bank's monetary control or monetary policy transmission mechanism (Al-Laham, Al-Tarawneh, & Abdallat, 2009; Berentsen, 1998; Abednigo & Apriansah, 2010).

In terms of currency substitution, if electronic money replaces deposits, the demand for money will moderately decrease, but even if the substitution of electronic money for the central bank currency will benefit enterprises

and households, cash and settlement services provided by central bank cannot be replaced by electronic money (Friedman, 2010; Bank for International Settlements, 1998). The Canadian study also found that, although the substitution of electronic money reduces the share of cash payments, the impact of this substitution will not be too strong in the short term (Ben, Miguel, & Gerald, 2014). It takes many years for more efficient electronic payments to be widely used, and the fees that merchants (consumers) pay for using those services are increasing (decreasing) over time (Böhme, Christin, Edelman, & Moore, 2015).

The relationship between money supply and stock prices is opined by the quantity theory of money. It posits that an increase in money supply creates a surplus that drives individuals to demand more shares. This leads to an increase in share prices. The liquidity hypothesis posits that there is a direct relationship between money supply and stock prices (Pu, 2002).

Money supply has a significant relationship with the discount rate and hence with the present value of cash flows. Competing theories exist that also aim to address the link between money supply and stock markets. These include theories postulated by Keynesian and real activist theories. The former argues that there is a negative relationship between the variables while the latter are of the view that this relationship is positive (Al-Laham, Al-Tarawneh, & Abdallat, 2009; Griffith, 2012).

The Keynesian economists argue that change in the money supply will affect the stock prices only if the change in the money supply alters expectations about future monetary policy. According to them, a positive money supply shock will lead people to anticipate tightening monetary policy in the future. They bid for funds in anticipation of tightening of money supply in the future, which will drive up the current rate of interest. As the interest rate goes up, the discount rates go up as well and the present value of future earnings falls. Stock prices consequently decline. Furthermore, they argue that economic activities decline as a result of increase in interest rates, which further depresses stock prices (Sellin, 2001).

The real activity economists believe that change in money supply, assuming accommodating monetary policy, provides information on money demand. In other words, they argue that increase in money supply means that money demand is increasing in anticipation of increase in economic activity. Higher economic activity implies higher expected profitability, which causes stock prices to rise. Hence, the real activity theorists argue that there is a positive relationship between money supply and stock prices (Sellin, 2001).

From an empirical perspective, e-money is found to affect money supply in the short-run. The effect is found to lessen in the longer term (Mahatir, Aimon, & Sentosa, 2020; Mehedi Nizam, 2021; Heryadi, Azwardi, & Sukanto, 2020). Zhou (2007) shows that, in China, e-money growth and development causes both changes in the medium of exchange and the supply structure of money. His study observed that the replacement of traditional money for e-money in circulation not only raises the money supply under the central bank's supervision, but also it raises the money supply out of the central bank's supervision (Zhou, 2007). Other studies have shown that electronic money in the form of a third-party payment also has a significant impact on the money supply (Zhou & Zhang, 2018)

Studies have also empirically shown that the emergence of e-money decreases money circulation speed at first but then the circulation speed will increase (Pu, 2002; You & Yuan, 2007; Wang & Wu, 2013). E-money encourages the substitution between financial assets and increases the velocity of the currency circulation (Xie & Yin, 2001). However, there are also studies that show that e-money substitution mainly has a substitution acceleration and substitution transformation effect, which leads to a long-term downward trend in the overall speed of China's currency circulation (Zhou, 2006)

A vector error correction model by Mohamadpour et al. (2012) assesses the monetary policy and stock market performance link for quarterly data for the period 1991-2011 in Malaysia. The study finds that there is a long run relationship between stock markets and monetary aggregates as well as the real interest rate. The study found that raising money supply increased the KLCI in the long term and that the relationship was statistically significant (Mohamadpour, Behravan, Espahbodi, & Karimi, 2012).

For the China economy, the link between stock market and monetary policy was analysed using event studies monitoring the responsive efficiency of the China stock market to monetary innovations of the central bank (Chen & Xie, 2016). The results indicated that the degrees of feedback from the Shanghai and Shenzhen stock markets varied in response to policy innovations. However, the effects were found to fade out three days beyond the data of monetary innovation (Chen & Xie, 2016).

**Methodology**

To carry out this analysis, this study methodology is divided into two (2) integral components. The first models the effects of e-money on monetary policy; while the second component models this transmission through money supply to capital markets. The study employs the autoregressive distributed lag model by Pesaran et al. (2001) to explore both components. This model will allow us to analysis of long run and short run dynamics between variables with the extra benefit of its ability to identify the existence of more than one cointegrating vector (Nkoro & Uko, 2016). The benefit to using this model is that, due to the consistency imposed by cointegration, we need not worry about issues of endogeneity between the variables of interest (Engle & Granger, 1987) and the model is applicable whether the series are I (0) or I (1).The model will be specified as follows

$$lnMS_t = A_i + \sum_{i=1}^{p} \alpha_i lnMS_{t-i} + \sum_{i=0}^{q} \beta EM_{t-i} + \sum_{i=0}^{q} \rho_i C_{t-i} + u_t \quad (1)$$

$$lnSP_t = B_i + \sum_{i=1}^{p} \sigma_i lnSP_{t-i} + \sum_{i=0}^{q} \tau_i MS_i + \sum_{i=0}^{q} \varphi_i D_{t-i} + v_t \quad (2)$$

where $lnMS$ is the natural logarithm of money stock; $EM$ is the development of e-money; $lnSP$ is the stock price index; $A$, $B$ are constant terms; $\alpha$, $\beta$, $\sigma$, $\tau$ are parameters; t is time period 1, 2,[. . .],T; and $C$ and $D$ are vectors of observed time-variant control variables. $p$, $q$ are optimal lag orders; $u_t$, $v_t$ are vectors of the error terms.

In the equation 1, money supply is affected by its previous lags, current e-money use and its lags and control variables. In equation 2, stock prices are determined by their previous lags, current money supply and its previous lags and a set of control variables.

**Data**

This study uses quarterly data from the period 2011 to 2021 in China. The proxy for e-money development is the value of e-money payments as a share of GDP. Monetary aggregate M1 will be used to monitor money supply. And finally, the Shanghai Shenzhen CSI 300 will be used to proxy stock market performance.

**Discussions and Conclusion**

E-money services have a notable contribution to monetary conditions and interest rates. Their operations are contributing heavily to the monetary aggregates, they have the potential to maneuver interest rate also as monetary aggregates and interest rates are closely related. As the e-money services can significantly influence two important monetary anchors, i.e., money supply and interest rate, special emphasis should be given to the proliferation of e-money services across the country during the formulation of two quarters of monetary policy of China. If the government needs to readjust/reduce the interest rate with an intent to stimulate economic growth, it, instead of explicitly capping interest rates, can alternatively enhance the coverage of mobile financial services throughout the country to effectively add new money to the existing monetary aggregates and in the process, can readjust interest rate to an intended lower level.

A change in the money supply is frequently assumed to positively affect stock prices. This positive causal relation is often based on a hypothesized inverse causal relation from money supply to interest rates and an hypothesized inverse causal relation from interest rates to stock prices. In this paper, we argue against the existence of these relationships. We show that the lack of a stable negative causal relation from money supply to interest rates, and from interest rates to stock prices, results in no significant long-term causal relation from money supply to stock prices.

The Central Bank should reduce the current double digit monetary policy to a single digit to attract investments in the capital market. High interest rate reduces cash flows of firms quoted in the stock exchange thus contraction in the values of securities traded on the market.

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