光华管理学院
Guanghua School of Management

金融学前沿问题探讨

第九届全球金融年会（GFC2002）论文选编

下

北京大学，2002年5月27-29日

Global Finance Conference 2002, Beijing

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第七部分

金融与经济发展

The relative effectiveness of monetary and fiscal policy: an econometric case study of China

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Abstract: This paper studies the relative importance of monetary and fiscal policies in China using St. Louis Equation. From the annual data series covering the period 1952-2000, we find that monetary policy and fiscal policy have played a central role in China's economic development. Tests on structural change further confirm that the relationships among gross domestic product, money supply and government expenditure are influenced by changes in the economic structure after the reform and opening up. Although there exist differences on the degree of statistical association among the growth rate of GDP, money supply and the government expenditure, an obvious conclusion is that from the econometric point of view, the relative importance of monetary and fiscal policies has changed places since the implementation of the reform and opening up. Monetary policy has become more prominent.

Key words: monetary policy, fiscal policy, structural change

I INTRODUCTION

Monetary and fiscal policies have important influences on economy. They provide primary ways to managing and adjusting the economy. In fact, monetary and fiscal policies are widely used as anti-cyclical stabilization instruments by different countries. However, there are controversies and divergence as to the interrelationships between monetary policy and fiscal policy, and their various combinations and coordination. While Keynesian macroeconomics emphasizes the importance of fiscal policy in expanding aggregate demand and achieving full employment, monetarists emphasize the dominant effect of monetary policy instead. The long-held debate enables people to cognize the different adjustment functions of monetary and fiscal policies.

To empirically study the relative importance of monetary and fiscal policies, Andersen and Carlson (1970) proposed the St. Louis Equation. They show that monetary policy is relatively more important than fiscal policy using the data for the period 1933:I-1969:IV in the U.S. Later, Keran (1970), Dewald and Marchon (1978), and Batten and Hafer (1983) discussed the relative importance of the two policy tools in certain other developed countries using the St. Louis Equation. However, these studies are all limited to countries with a highly developed economy such as Canada, France, Germany and Japan. In order to test whether the St. Louis Equation is applicable to the middle developed countries, Chowdhury (1988) has used the data for the period 1966:I-1984:III in six European countries to estimate St. Louis Equation. Empirical evidences of Denmark, Norway and Sweden show that monetary policy is relatively more important than fiscal policy. In Belgium and the Netherlands, on the contrary, fiscal policy is more important than the monetary policy. In Austria, no exact conclusion can be drawn when the St. Louis Equation is used to analyze the relative importance of its monetary and fiscal policies. The author pointed out that different conclusions result from the different mechanisms in each country.

To test whether St. Louis Equation is really of the same effectiveness in different countries, Masood and Ahmad (1984), Hussain (1982), Darrat (1984), Saqib and Yasmin (1987) and Upadhyaya (1991) have analyzed empirically the historical data in less developed countries in Asia and Latin America. The analyses of Latin American countries support the Keynesian position that fiscal policy is more important than monetary policy while the results of the other studies confirm that monetary policy is more important than the fiscal policy.

Owoye and Onafowora (1994) studied the relative importance of monetary and fiscal policies in ten African countries using the St. Louis Equation. Their samples are the annual data for the period

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1960-1990. The results show that monetary policy is relatively more important than fiscal policy in five of the ten countries (Ghana, Kenya, Morocco, Nigeria and South Africa) while fiscal policy is relatively more important than monetary policy in the other five countries. An interesting finding is that all the five countries in which monetary policy is relatively more important have the relatively well-developed stock markets. It suggests that because of the linkage between stock prices and the amount of money supply, stock market may serve as the channel through which monetary policy is transmitted to the economy. In addition, in the six of the ten countries, the growth in government spending is the Granger cause of the growth in money supply. This indicates that money supply is endogenous in these countries and bank monetary policy lacks independence.

To sum up, since Anderson and Carlson (1970) proposed the St. Louis Equation to test the relative importance of monetary and fiscal policies, this single equation model has been widely applied and testified in different countries since then. Generally speaking, countries whose economy developed faster, more stable and had a relatively sophisticated financial system provided evidences that support the view that monetary policy is the more important; On the other hand, in a slowly developed economy, Keynesian view that fiscal policy is the more important is held dominant.

In this paper we analyze the Chinese economy using the St. Louis Equation. China is a developing country. China's economic system has changed dramatically since the reform and opening up. The planned economic system has transformed into socialist market-oriented economic system. Its financial structure is also under constant change. Have the functions of monetary and fiscal policies also been changing? This is a unique question.

The rest of this paper is organized as follows. Section II discusses historical environment and theoretical under pinning, Section III discusses the data and the empirical results. Section IV concludes the paper.

II Historical environment and theoretical under pinning

Under the planned economic system, state management of finance was highly centralized and easy to control. The focus of China's financing and banking tasks is to keep the balance between fiscal revenue and expenditure, the balance between credit income and payment and the balance between materials supply and demand. Aiming at the relatively unsubstantial foundation of national economy at that time, the state acquired the financial abilities on economic construction. In 1950, China's government expenditure was only RMB 6.8 billion. It reached RMB 112.209 billion in 1978. During 1950-1978, government expenditure on economic construction added up to RMB 827.395 billion, which accounted for 57.79% of the total government expenditures; government expenditure on social, cultural and educational development added up to RMB 180.619 billion, which accounted for 12.62% of the total government expenditures. The fiscal policy of centralized control over the revenues and expenditures contributed obviously to the rapid recovery of the economic construction in new China. In the first "five-year plan", the average annual national income increased by 8.9%. The average annual national income increased by 14.7% during 1963-1965.

From the relationship between banks and finance, the basic properties of the traditional system are allocating resources and adjusting social reproduction according to national plans. Finance, as a revenue and expenditure department of the state government, fully embodies the will of the state. Thus it is dominant in distribution of social capitals. The bank, as a teller organ of the finance, is in a totally dominated position. Not only its income and spending dimensions and the scope of its participation in social reproduction adjustment are strictly restricted, it also lacks independent position and adjusting function. The bank credit often becomes an instrument to balance the fiscal revenue and expenditure. Hence, the relationship between monetary and fiscal policies under the traditional system is mainly embodied in that fiscal policy dominates monetary policy and monetary policy attaches to fiscal policy.

Since its reform and opening up, financial system in China has dramatically changed. In 1980, the State Council decided that the way of the investment in capital construction is changed from financially unpaid appropriation to bank loan and that loan extension be resumed to self-employed individuals engaged in individual industrial or commercial business. In 1983, banks took over the supply and management privileges of the current funds for state-owned enterprises from Ministry of Finance, which expanded gradually the bank's business scope. In September 1983, the People's Bank of China became the central bank. Later, four major specialized banks changed into state-owned commercial banks. In the meanwhile, numerous national and regional commercial banks and policy banks were established. Many non-bank financial institutions also developed rapidly. With the establishment and development of the financial institutions, financial tools and financing instruments have become diversified, and the bank

credit replaces budgetary grants as the major source of capital. The financial market has also possessed preliminary dimensions and been on the right track. All this provides necessary conditions for the central bank to adjust the economy with monetary policy. Monetary policy has become gradually the primary instrument for the government to adjust the economy.

Compared with the banking system reform, the fiscal system reform proceeded very slow and was lagged behind. With the power and profits transferred to the local governments and enterprises, financial capability of the central government has been scattered and weakened and the proportion of revenue of the central government in the total government revenue has decreased constantly. Although the original unified revenue pattern has broken, the expenditure pattern has not yet been correspondingly adjusted. This has led to substantial decrease in the governmental revenue as percentage of gross national product[1] and thus influenced the government financial capability of adjusting and controlling the macro economy. Because of the imbalance between the growth in government revenue and the growth in economics and also because of the difficulties in structural adjustment and compression, the budget deficit is very large. The central government has to issue a huge amount of national debts to pay off the budget deficit and increase the revenue. Meanwhile, the central government cannot get out of the "pay old debts with new debts" trouble. In this way, the macro adjustment part of the government finance that serves as one of the main adjustment instruments shrinks and the effects of fiscal policy are weakened.

The impact of monetary and fiscal policies depends on the transmission mechanisms. For monetary policy, St. Louis model emphasizes that interest rate plays an important role in monetary transmission process, which is similar to the Keynesian view. But the interest rate in China, which is controlled by the government, cannot truly reflect the investment cost and the demand and supply of credit funds lack interest rate flexibility. The effects of the expansionary monetary policy in China are mainly exerted through the bridge of domestic credit. In practice, the People's Bank uses the overall credit ceiling as an intermediate objective to enforce direct monetary policy. For example, in 1989 and 1993, through direct control over bank credit and some other instruments, the overheated economy was restrained by tight policy. In 1984, 1988 and 1992, also through the bridge of domestic credit level, the aggregate social demand was influenced by expansionary monetary policy and then the economy developed rapidly.

The transmission mechanism of fiscal policy often affects economy through government spending or tax. The increase or decrease of government spending affects through the multiplier the aggregate demand and leads to rise or fall in aggregate output. However, after the reform and opening up, the transmission mechanism of fiscal policy as mentioned above cannot exert its effects for various reasons. Since government expenditure is rigid, it is easy to augment but difficult to reduce it. The expenditure depends greatly on the scope of government functions while the expenditure is indispensable to achieve these functions. The expenditure is not merely rigid; it also requires expansion and has little reduction flexibility. During the 1978-1999 period, while the total government expenditures increased by 11.75 times, the contemporaneous expenditure for government administration increased by 38.19 times and expenditure for price subsidies increased by 34.44 times, expenditure for economic construction only increased by 7.03 times. This increases undoubtedly the difficulty for in using fiscal policy to adjust the economy. If tight or expansionary fiscal policy is pursued through tax instrument, it is difficult to tell the transmission mechanism of such a fiscal policy because of the unreasonable tax system. In China, tax revenues lay particular stress on state-owned enterprises. There are no reasonable criteria and management gauging instruments for taxing the non-state-owned enterprises, the third industry, joint venture enterprises and individual income. All of these make the contributions of various economic sectors to public finance out of accord with their developmental situations and status. In addition, various transitional tax policies do not really help those taxation objects that increase supply directly and constrain those taxation objects that form social demand directly. Thus the phenomenon of casual tax reduction and exemption outside the tax law and national prescripts is very serious, and justice, impartiality and integration of financial levy cannot be ensured. At the same time, widely-existed tax dodging, tax evasion, tax cheating and tax reduction and exemption which extends beyond one's authority weaken greatly the effects of fiscal policy and further complicate the influence of fiscal policy on economy.

It can be seen that after the reform and opening up, changes in monetary and fiscal policies in China have exerted quite a different, important influence on its economy.

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[1]For example, in 1957, 1965 and 1970, government revenue accounted for 28.4%, 27.6% and 29.4% of gross national product respectively; in 1978, government revenue accounted for 31.2% of gross national product; in 1985, 1990 and 1995, government revenue accounted for 22.4%, 15.8% and 10.7% of gross national product respectively; in 1999, government revenue accounted for 14% of gross national product (*China Statistical Yearbook,2000*').

III DATA AND EMPIRICAL RESULTS

Annual data include Gross Domestic Product (GDP), currency in circulation at the end of the year (M0), money supply in narrow sense (M1), money supply in broad sense (M2) [2], government expenditure (GE). Series are transformed into logarithms. The sample period of analysis is from 1952 to 2000[3].

We first conduct unit root tests and Granger causality tests to identify the properties for all time series variables.

To test whether the series are integrated and how much the order of integration is, the Augmented Dickey-Fuller (ADF) unit root tests are performed on the sample data in different period respectively. The unit root tests performed here include a non-zero intercept and a deterministic linear time trend. The Augmented Dickey-Fuller unit root test results are presented in Table 1.The estimated statistics show that all the first-order differences of logarithms of annual series are stationary variables.

Table 1. ADF unit root tests (1952-2000)

Note. ADF is augmented Dickey-Fuller statistic; C is constant; T is trend; Δ is the first difference operator; Ln denotes the value of logarithms of each series; *significant at 10% level; **significant at 5% level; ***significant at the 1% level.

	Level form				First difference form		
	ADF	t-statistic for C	t-statistic for T		ADF	t-statistic for C	t-statistic for T
LnGDP	-1.562	1.617	2.063**	Δ LnGDP	-4.495***	1.046	2.034**
LnM0	-1.089	1.353	1.608	Δ LnM0	-4.285***	1.009	1.640
LnM1	0.019	0.509	0.442	Δ LnM1	-4.711***	1.947*	0.0009
LnM2	0.133	0.543	0.599	Δ LnM2	-3.705**	1.465	1.373
LnGE	-1.744	1.777*	2.009*	Δ LnGE	-5.543***	0.624	2.041**

The following equation test Granger causality:

$$y_t = A_0 D_t + \sum_{j=1}^{k} \alpha_j y_{t-j} + \sum_{j=1}^{k} \beta_j x_{t-j} + \varepsilon_t \quad (1)$$

Where A_0D_t denotes the non-stochastic part of the equation, such as intercept, trend, etc. *F*-statistics of Granger causality test are listed in table 2. If it is significant, then causality exists between two variables.

It can be seen from table 2 that a possible feedback relationship exists between M0 and GDP. It indicates that M0 is endogenous. GDP is the Granger cause of money supply M0, it indicates that M0 changes after the changes take place in GDP. From Fig.1, it can also be seen that before the mid-1980s, the fluctuation of M0 on average lagged behind that of GDP for about one year and then the fluctuations of GDP and M0 are synchronous. The bi-directional causality between M0 and GDP is anticipated. Before the reform, both the dimension and objective of China's economic development were organized and administered by planning. The cash plan reflected the distribution plan of national income while the distribution plan depended on the development situation of production. Therefore, the magnitude of output decided the amount of current cash. The "money goes with materials" economy made it difficult for the central bank to control the various factors affecting cash and cash was one endogenous variable jointly determined by all the macroeconomic variables. A relatively weak one-directional causality exists between GDP and M1 or M2. A relatively weak feedback relationship exists between government expenditure and GDP in the entire sample period (1952-2000). Their fluctuations are synchronous before the reform and opening up (see figure 2), and it means no Granger causality exists between them.

The results of Granger causality test show that M1 and M2 can be used as monetary policy variables and GE can be used as fiscal policy variable.

[2] Narrow money supply used in this paper is M1 = M0 +the sum of various deposits-budgetary deposits- savings deposits; broad money supply used in this paper is M2 = M1 + savings deposits.

[3] The data from 1952 to 1999 used in this paper are from the *China Statistical Yearbook 2000* published by the National Bureau of Statistics (People's Republic of China) and *Almanac of China's Finance and Banking (1988-2000)* published by the People's Bank of China. The data in 2000 used in this paper are from the *Statistical Communiqué of The People's Republic of China On The 2000 National Economic and Social Development* published by National Bureau of Statistics (People's Republic of China).

Table 2. F-statistics of Granger causality tests

Note: F1 refers to one lag on each variable; F2 refers to two lags on each variable; F3 refers to three lags on each variable; F4 refers to four lags on each variable.

*Significant at 10% level; **significant at 5% level; ***significant at the 1% level.

	1952-2000	1952-1978		1952-2000	1952-1978
H_0: M0 does not Granger cause GDP	F2=2.715*	F1=14.477***	H_0: GDP does not Granger cause M0	F2=4.638**	F1=2.656
	F3=1.967	F2=4.2864**		F3=4.372***	F2=5.484**
	F4=2.165*	F3=1.3434		F4=3.871**	F3=28.106***
H_0: M1 does not Granger cause GDP	F2=0.0747	F1=2.1395	H_0: GDP does not Granger cause M1	F2=3.5329**	F1=1.3073
	F3=0.2657	F2=0.65847		F3=2.5882*	F2=1.46328
	F4=2.0155	F3=2.3385		F4=2.0625	F3=1.1215
H_0: M2 does not Granger cause GDP	F2=0.3583	F1=1.3343	H_0: GDP does not Granger cause M2	F2= 3.4186**	F1=1.4948
	F3=0.57448	F2=0.3179		F3=2.16705	F2=1.0963
	F4=2.582*	F3=2.3113		F4= 2.0627	F3=0.6675
H_0: GE does not Granger cause GDP	F2=4.0287**	F1=0.7951	H_0: GDP does not Granger cause GE	F2= 2.4771*	F1= 4.0855*
	F3=. 0694**	F2=1.5496		F3=1.8622	F2= 3.3256*
	F4=2.9316**	F3=0.9231		F4=2.3468*	F3=2.1082

Fig.1 The growth rate of GDP and M0 (1952-2000)

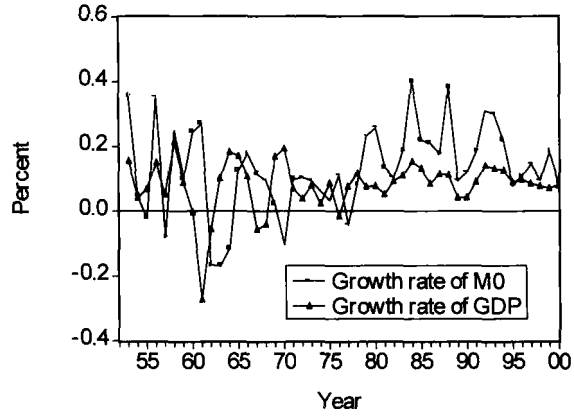
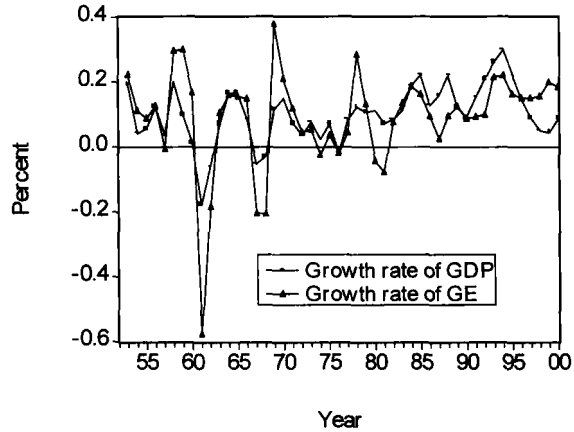


Fig.2 The growth rate of GDP and government expenditure (1952-2000)



The modified St. Louis Equation is thus:

$$Y_t = C_0 + \sum_{i=0}^{j_1} m_i M_{t-i} + \sum_{i=0}^{j_2} f_i F_{t-i} + \varepsilon_t \qquad (2)$$

where Y, M, F represent respectively the first-order differences of the logarithms of GDP, money supply (M1 or M2) and government expenditure (GE).

Estimating for the entire sample period 1952-2000, we see from table 3 that the impacts of monetary policy variables (M1 or M2) and fiscal policy variable (GE) on GDP contemporaneously are comparatively significant, especially the impacts M2 on GDP are comparatively strong. Its relative coefficient is 0.4282. But the impacts of one-period lag and two-period lag monetary and fiscal policy variables on the GDP are not significant. The summed impacts of monetary policy variables on GDP are respectively 0.3691 and 0.427. Both of them are obviously higher than the summed impacts of fiscal policy variable on GDP and they are also significantly different from zero at least at 5% level.

Table 3 Estimate the St. Louis Equation

Note: The systems include the first-order differences of the logarithms of GDP (represented by GDP), first-order differences of the logarithms of money supply with two lags (represented by M_1 or M_2), first-order differences of the logarithms of government expenditure with two lags (represented by GE). The figures in parentheses are the value of the t-statistics. * Significant at 10% level; **significant at 5% level; ***significant at the 1% level.

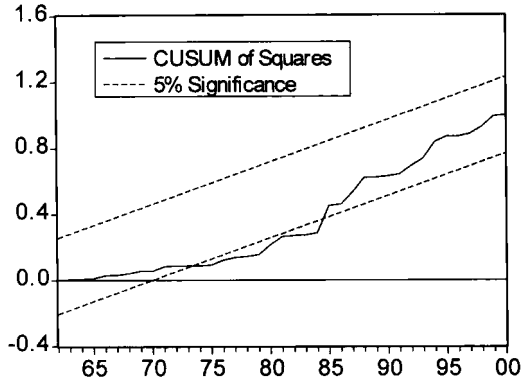
	1952-2000		1952-1978		1979-2000	
	System (GDP, M1,GE)	System (GDP, M2,GE)	System (GDP, M1,GE)	System (GDP, M2,GE)	System (GDP, M1,GE)	System (GDP, M2,GE)
C_0	0.0255 (1.3636)	0.0166 (1.0930)	0.05431 (5.3004***)	0.0503 (5.0443***)	-0.1696 (-3.0781***)	-0.1333 (-4.0522***)
m_0	0.3168 (2.8406***)	0.4282 (4.3950**)	0.2018 (2.8579**)	0.2428 (3.3837***)	0.7049 (3.6993***)	0.7219 (5.9040***)
m_1	0.04989 (0.4633)	0.0437 (0.4201)	-0.2319 (-3.4178***)	-0.2294 (-3.1946***)	0.9090 (4.7470***)	0.6294 (5.0397***)
m_2	0.0023 (0.0225)	-0.0440 (-0.4770)	-0.1063 (-1.5973)	-0.10898 (-1.5935)	0.2292 (1.4544)	-0.1351 (-1.2049)
$\sum_{i=0}^{2} m_i$	0.3691 (2.6737**)	0.427 (4.2431***)	-0.1364 (-1.4514)	-0.0956 (-1.02641)	1.8431 (5.4093***)	1.2162 (7.8352***)
f_0	0.3362 (5.0655***)	0.2945 (5.0437***)	0.3283 (9.1129***)	0.3269 (9.0441***)	-0.0857 (-0.3929)	0.2139 (1.5171)
f_1	0.0228 (0.3637)	0.0145 (0.2481)	0.03815 (1.1355)	0.04219 (1.2705)	0.44608 (1.9538*)	0.09148 (0.6408)
f_2	-0.0677 (-0.9672)	-0.0881 (-1.4816)	-0.0517 (-1.3527)	-0.0434 (-1.1602)	-0.5023 (-2.6778**)	-0.1717 (-1.4790)
$\sum_{i=0}^{2} m_f$	0.2913 (2.6442**)	0.219 (2.2897**)	0.3147 (5.0934***)	0.3257 (5.2052***)	-0.1419 (-0.6531)	0.1336 (0.9429)
R^2	0.6176	0.71447	0.9098	0.913434	0.7179	0.8649
DW	0.92867	1.86368	2.7189	2.740570	1.38097	1.7039
F	10.4983***	16.2647***	28.5888***	29.8903***	6.365175***	16.0053***

China's economic system has changed dramatically since the reform and opening up. The planned economic system has transformed into socialist market-oriented economic system. Its financial structure is also under constant change. Have the functions of monetary and fiscal policies also changed? Has the relationship between variables changed? Structural test is carried out to see whether the structural stability of the model. Chow-test and CUSUM of squares test of recursive residuals (Wojciech W Charemza, Derek F Deadman.1993) are performed to test whether the relationships among GDP, monetary policy variable and fiscal policy variable have changed.

In Chow-test, the year 1978 is selected as the year when changes in the economic structure took place, i.e. the reform and opening up is marked as a demarcation line. The F- statistic is 8.275 and it is statistically significant at the 1% level, Log likelihood ratio is 47.531 and it is statistically significant at 1% level. It shows that the structure of St. Louis model is different before and after the reform and opening up. Since the reform and opening up in 1978, the relationships among GDP, monetary policy variables and fiscal policy variable have changed dramatically. The results of CUSUM of squares test are

presented in figure 3[4]. From figure 3, we can see that the CUSUM of squares during the1975-1985 period is beyond the scope of 5% critical value. It shows that the relationships among GDP, monetary policy variables and fiscal policy variable have changed. Thus, the sample period can be divided into two phases: the phase before the reform and opening up and the phase after that.

Fig.3 CUSUM of squares test (1952-2000)



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It can be seen from table.3 that the impacts of one-period lag and two-period lag M1 and M2 on the growth rate of GDP are negative during 1952-1978. The summed impacts of monetary policy variables M1 and M2 are negative but not significant. The reasonable explanations are as follows. (i) Before the reform, the price effects in the monetary transmission mechanism were restrained. Monetarist Friedman stresses particularly the price effects in monetary transmission mechanism. He deems that increase of money supply will cause the rise of value of asset and the fall of interest rate through increase of public expenditure and that the low interest rate will stimulate new capital production, which will lead to the increase of income. This process is embodied in a short term as the fall of the interest rate and the rise of the output. In a long term it is embodied as the recovery or even the rise of interest rate and the general rise of average price level. However, before the reform, the price level in China was controlled basically by state instead of being decided by the market. Thus the positive effect of money supply on price was restrained. Under a highly centralized planned economic system, the state will have to compulsorily decrease the monetary purchasing power at a certain time through rationing due to the rigidity of price when money supply is superabundant (the rate of money supply increases) and the social demand exceeds the aggregate social supply. In this way the balance of aggregate supply and aggregate demand is achieved by postponing abnormally the velocity of money circulation. In this case, the capital construction cycle will be prolonged because goods and services cannot be supplied in time. The productive sectors cannot fully exert their productive capability because of the deficiency of impetus and raw materials, the labor suffers because their income cannot purchase the necessities. The hidden inflation is formed. The accelerated increase of money supply prevents the economy from normal development in this special background and leads to the negative effects of aggregate impacts, but this kind of impact is not very significant. (ii) Before the reform, there were many restrictions on operation of capital. The monetary transmission mechanism was not smooth and the efficiency of capital exertion was low. The relatively low productive level also restrained the economic development. Monetary impact on the

[4] The results of CUSUM of squares test used in this paper come from system included GD, M2 and GE. The results of CUSUM of Squares test about system included GD, M1 and GE is very similar.

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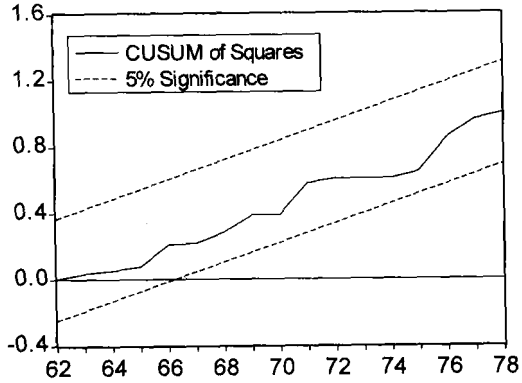
economy was hindered. Although the impacts of one-period lag and two-period lag M1 and M2 on GDP are negative, their absolute values are far less than 1. That is to say, if the other factors remain the same, although the increased money supply slows down a bit the speed of economic development during t-1 and t-2 period, it still keeps increasing.

Results also show that changes in government expenditure will be reflected quickly in GDP, the changes are mainly instantaneous impacts. The summed impacts of fiscal policy on GDP are respectively 0.3147 and 0.3257, they are also significantly different from zero at 1% level.

It can be seen that the fiscal policy is relatively more important than the monetary policy before the reform. It can be found that this result of econometrics has its own historical background if the fiscal policies adopted after the founding of P.R.C. are reviewed.

The results of CUSUM of squares test of recursive residuals during the 1952-1978 period are displayed in figure 4. It can be seen that the CUSUM of squares lies a little beyond the scope of 5% critical value. Generally speaking, no structural changes take place in the relationships among GDP, monetary policy variable and fiscal policy variable during this period.

Fig.4 CUSUM of squares test (1952-1978)



The results of estimation using the second phase (1979-2000) of annual data are listed also as table 3. A preliminary impression can be made from table.3: the relative importance of monetary and fiscal policies has changed places during the period 1979-2000. The summed impacts of monetary policy variables on GDP are respectively 1.8431 and 1.2162, both of them significantly different from zero at the 1% level. This implies that a one-percent change in the monetary policy variable leads to 1.8431% or 1.2162% change in GDP in the long run. In addition, the individual estimated coefficients also show that the impact of monetary policy variable on GDP is great and lasting (it will last at least two years), especially the impacts of current period, one-period lag of monetary policy variables on GDP are comparatively strong, their relative coefficients are all more than 0.6 and significantly different from zero at the 1% level. This implies that changes in monetary policy will lead to positive fluctuation of GDP 1~2 year later. Comparatively speaking, the impact of fiscal policy variable on GDP is very feeble. The summed impacts of fiscal policy variable on GDP are negative or small but not significant, both of them are obviously lower than the summed impacts of monetary policy variables on GDP. The individual estimated coefficients are not significant for the greater part.

The results of the recursive regression test for the 1979-2000 periods are presented in Figure 5. Figure 5shows that the CUSUM of square lays below the scope of 5% critical value. It means that during this period, there have been no structural changes in relationships among GDP, monetary policy variables and fiscal policy variable.

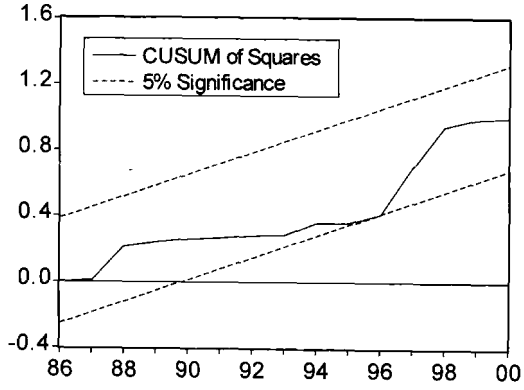
It can be seen that after the reform and opening up, changes in monetary and fiscal policies in China have exerted an important influence on its economy, the monetary policy is relatively more important than the fiscal policy.

Ⅳ CONCLUSION

This paper empirically studies the relative importance of monetary and fiscal policies in China using the St. Louis Equation. We find that monetary policy and fiscal policy have played a central role in China's economic development. Although there exist differences on the degree of statistical association among the growth rate of GDP, money supply and the government expenditure, an obvious conclusion is that the relative importance of monetary and fiscal policies has changed places since the implementation

of the reform and opening up. Monetary policy has become more prominent. On average, that changes in monetary policy will lead to positive fluctuation of GDP 1~2 year later. Further research may focus on attempting to test whether some other variables (such as imports or exports, indexes of stock) can also affect economic growth in the St. Louis equation.

Fig.5 CUSUM of squares test (1979-2000)



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我国金融发展与经济增长关系的实证分析

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提要：本文从实证的角度对我国金融发展与经济增长间的关系进行了研究。文章运用了 3 种方法：相关分析、格兰杰因果关系检验以及柯布—道格拉斯生产函数框架基础上的计量分析。相关分析结果显示我国金融发展与经济增长之间存在非常高的相关程度；而格兰杰因果关系检验结果表明，我国金融发展与经济增长之间存在一种双向因果关系；计量分析的结果则进一步加强了这一发现。文章结论与我国正处于从转轨经济向成熟的市场经济过渡的基本国情相吻合，对供给主导假说及需求遵从假说均提供了有力支持。

关键词：金融发展　经济增长　供给主导　需求遵从

An Empirical Analysis of Financial Sector Development and Economic Growth in China

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Abstract: This article investigates the relationship between financial sector development and economic growth for China. We have used three approaches: The correlation analysis, Grange causality tests and econometric analysis based on Cobb-Douglas production function type equation. The results of the correlation analysis indicate a high degree of association between financial sector development and economic growth; The results from the Grange causality tests indicate that there is a two-way relationship between financial sector development and economic growth. The results from regression model further reinforce the findings of the causality analysis. The conclusion is consistent with the fact the china is developing from less-developed country to developed country, it also supports the Supply-leading and Demand-following hypothesis.

Key Words: Financial Development, Economic Growth, Supply-leading and Demand-following.

我国金融发展与经济增长关系的实证分析

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经济发展历史包含了金融发展与经济增长关系的许多范例，越来越多的经济学家认为金融发展在促进经济增长方面发挥了重要作用。涵盖发达国家与发展中国家的大量实证研究也已经证明了上述看法。近年来，许多学者（如，宾国强，1999；谈儒勇，1999；韩廷春，2001）对我国金融发展与经济增长间的关系进行了研究，得出了许多有价值的结论，但我国金融发展在经济增长中的作用并没有被完全考查，本文试图在这方面作出尝试和探索。文章由以下五部分组成：第一部分对金融发展与经济增长关系的有关理论与经验文献作一综述，第二部分分析了我国的货币化进程与经济增长，第三部分给出了格兰杰因果关系检验的有关结论，第四部分对金融发展与经济增长进行了计量分析，最后进行总结并给出政策建议。

1．历史文献的简单回顾

对于金融发展在促进经济增长方面的重要性，许多文献（Patrick，1966；Porter，1966；Khatkhate，1972；Mckinnon，1973）都作了广泛研究。其中，部分经济学家认为，金融发展是经济增长的一个必要条件（Goldsmith，1969；Shaw，1973），这便是 Patrick（1966）所认为的金融发展的“供给主导”（supply-leading）作用。金融发展在动员储蓄、管理风险、便利交易等方面的积极作用有助于经济增长[1]。但是，对于金融发展究竟如何影响经济增长的问题却存在许多争论（Spears，1992）。以 Goldsmith（1969）为代表的结构主义者认为，金融发展以金融资产的形式直接增加储蓄，从而促进了资本形成与经济增长。Sinai 和 Stokers（1972）以及 Wallick（1969）的有关文献均对这一假说提供了经验支持。而另一方面，以 Mckinnon（1973）与 Shaw（1973）为代表的金融压抑主义者却认为，现金余额的实际收益率是资本形成及由此取得经济增长的关键性决定因素。根据这一观点，经济增长基础上的金融发展绩效取决于利率的发展绩效。因此金融压抑主义者认为，实行金融自由化、放松利率管制最为重要。运用传统的总储蓄方程，Fry（1988）基于亚洲不发达国家进行的一项实证研究发现，利率对总储蓄函数具有明显的正向作用，尽管这种明显的积极效果对其他多数国家很小；但其他的许多经验研究并没有发现实际利率与国内储蓄间存在任何较强相关关系。Gupta （1987）在其选择的亚洲及拉丁美洲国家的研究中也发现了一些支持金融压抑主义者观点的证据：利率自由化有利于发展中国家产生高水平的储蓄。

与上述观点截然相反的是，Patrick（1966）认为相对于经济增长金融发展处于一种“需求遵从”（demand following）地位，即其通过对经济增长所引致的新增金融服务需求来产生影响，

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[1] 金融发展促进经济增长具体体现在以下方面：(1)金融市场增强小额储蓄者聚集资金的能力；(2)储蓄者拥有刺激储蓄的更宽范围的工具通道；(3)当金融储蓄在总财富中的比例上升时，资本的有效分配得以实现；(5)金融中介部分解决了信贷市场的逆向选择问题；(6)金融市场鼓励了生产的专业化、企业的发展和新技术的采用。

因此金融发展附属于（handmaiden）经济发展（Stern，1989）。实际经济部门的增长方便了金融部门的发展，当经济增长时，其需要更多种类的金融服务和不断增长的金融机构来提供这些服务。根据这一观点，金融机构与金融服务的稀缺反映了对服务的低需求。既然金融中介有助于将一国资源从低增长部门向高增长部门转移，那么，对金融中介的需求同样取决于经济中不同部门增长速度的变化（Patrick，1966）。

对以上两种结论的综合观点是，金融发展与经济增长间存在双向关系，Patrick（1966）认为，金融发展与经济增长间的关系取决于经济发展所处的阶段。在发展早期，金融部门的扩张通过金融机构的产生与金融服务的供给来促进经济增长，这与上面解释的“供给主导”观点相一致。但是，在经济发展的较高阶段，金融部门则处于“需求遵从”的地位。

近年来，一些研究采用了内生增长方法。Bencivenga 和 Smith（1991）的研究表明，金融中介的存在降低了对低收益流动资产的投资，在风险厌恶假设条件下，金融中介下的均衡可以比无金融中介下的均衡产生更高的增长率。而支持 Cooley 和 Smith（1991）所认为的金融市场促进市场分工与技术创新观点的证据同样可以在内生经济增长模型中获得（King 和 Levine, 1993）。在采用了跨国回归及金融发展微宏观效应的案例分析的内生增长模型进行研究后，King 和 Levine（1993）发现，金融发展通过选择高质量企业与优良项目来提高生产效率。发达的金融市场通过提高储蓄率及（或）鼓励技术创新来促进资本积累与经济增长（Grossman 和 Helpman，1991；Aghion 和 Howitt，1992）。

更为最近以来的一些研究将股票市场也纳入了分析范围，它们发现，不仅金融发展与经济增长之间存在较强的正向关系，而且在金融深度与经济增长之间也存在明显的相关关系；此外还发现，金融发展的初始水平是后来经济增长率的良好预测。因此，金融并不是仅仅追随经济行为，而是对经济增长与资本积累起着积极作用（Levine, 1997；Levine 和 Zervos , 1998；Rajan 和 Zingales, 1998；Arestis 等人, 2001）。

谈儒勇（1999）运用 OLS 对我国金融发展与经济增长间的关系进行线性回归，认为金融中介与经济增长之间相互促进。但是，其判断依据乃是基于金融发展与经济增长间的线性关系，并没有明确给出其中的因果关系，即究竟是经济增长引起金融发展、金融发展引起经济增长还是金融发展与经济增长间相互促进。韩廷春（2001）采用金融发展与经济增长关联机制的计量模型，运用我国经济发展过程中的有关数据进行了实证分析，认为技术进步与制度创新是经济增长的最为关键因素，而金融发展对经济增长的作用极其有限，并对其中的原因作了进一步分析。但是，其重点似乎更多地放在影响经济增长的其他变量的分析上，而由此得出金融发展与经济增长关系的结论似乎有待商榷。本文拟将重点放在金融发展与经济增长的各自不同的测量指标上，并通过标准的格兰杰因果关系分析及内生经济增长模型基础上的计量分析，从而对我国金融发展与经济增长间的关系做一全面考查。

2．我国的货币化进程与经济增长

我国从 1978 年开始实行改革开放，因此，依照惯例我们选取 1978 年作为我们的研究起始年。我们从《中国统计年鉴》、《中国金融年鉴》、《中国经济年鉴》相关各期及《新中国五十年统计资料汇编》等进行 1978—1999 年年度数据的收集、整理与计算，详见表 1。为了分析金融发展，我们采用金融发展的以下 3 个测量指标[②]：

（1）广义货币（现金加活期存款与准货币）与名义 GDP 之比（M_2/YN）。这一测量指标

[②] Goldsmith(1969)已讨论了金融发展的可供选择的测量。

被作为经济货币化变量广泛运用于各类文献。

（2）准货币（定期存款与储蓄存款）与名义 GDP 之比（QM/YN）。一般认为，用准货币（Quasi-Money）对金融中介进行测量比 M_2 更为准确，因为它排除了货币供给中的现金与活期存款，而货币供给总量中的这两项组成常被视为货币交易而非资产需求。

（3）国内信贷（Domestic Credit）与名义 GDP 之比（DC/YN）。在不发达国家中，国内信贷主要被用来为国内企业的投资活动进行融资，它代表了单一的最为重要的投资基金来源。因此，国内信贷被认为是推动经济增长的一项重要金融服务，对经济的增长至关重要（King 和 Levine，1993）。

需要指出的是，GDP 则是某一年度内的累计值；M_1、M_2、QM 的统计数据为年末余额，而我国部分年份的通货膨胀率较高，因此为减轻物价变动带来的不利影响，我们依照 King 和 Levine（1993）的做法，对 M_1、M_2、QM 上年度末与本年度末的数值进行算术平均后作为本年度数值。在研究中我们采用实际 GDP（Y）与人均实际 GDP（PY）作为收入变量。其中，实际 GDP 等于名义 GDP 除以 GDP 平减指数，并转换成 1978 年的价格水平；而人均实际 GDP 等于人均名义 GDP（GDP per capita）除以 GDP 平减指数，并转换成 1978 年的价格水平。

表 1 中国主要金融、经济和货币化指标（1978—1999：仅列出其中的 6 年，单位：亿元）

时　间	1978	1980	1985	1990	1995	1999
国内信贷 DC	1850	2414.3	5905.6	17680.7	50544.1	93734.3
M1	842.5	1310.25	3136.25	8070.15	22260.35	42395.4
QM	185.3	340.25	1536.35	5551.5	31576.4	69802.8
M2	1027.8	1650.5	4672.6	13621.65	53836.75	112198.2
实际 M1	842.5	1219.23	2445.81	4441.96	6849.49	12899.6
实际 QM	185.3	316.61	1198.12	3055.64	9716.03	21238.8
实际 M2	1027.8	1535.84	3643.93	7497.6	16565.52	34138.4
名义 GDP（YN）	3624.1	4517.8	8964.4	18547.9	58478.1	81910.9
实际 GDP（Y）	3624.1	4203.96	6990.89	10209.09	17993.66	24922.9
实际人均 GDP（PY）	379	428.05	666.77	899.38	1493.57	1988.09
名义人均 GDP（PYN）	379	460	855	1634	4854	6534
DC/YN	0.510	0.534	0.659	0.953	0.864	1.14
QM/YN	0.051	0.075	0.171	0.299	0.540	0.852
M2/YN	0.284	0.365	0.521	0.734	0.921	1.370

表 1 中的数据表明：以各种货币总量进行测量的货币供给呈现出一种明显的增长迹象，例如，名义形式上的 M_1、QM 和 M_2 从 1978 年到 1999 年分别增长了 50.32、376.7 和 109.16 倍。国内信贷从 1978 年的 1850 亿元扩张到 1999 年的 93734.3 亿元，上升了 50.67 倍。类似地，实际货币余额（M_1）增长 15.31 倍，实际形式的准货币增长 114.62 倍，实际形式的 M_2 增长 33.22 倍。同一时期实际 GDP 增长 6.88 倍而实际人均 GDP 增长 5.25 倍。M_2 与名义 GDP