The Capital Flight and Its Factors in China

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Abstract. Since China joined the WTO in the last century, China has made great economic achievements. However, at present, there are difficulties in China's economic growth, serious unemployment, no new economic growth point and so on. In fact, among the causes of these problems, a long-term attention to the problem of capital loss is capital flight. This paper analyzes the scale and causes of capital flight in China, and makes an empirical analysis using time series data. It is concluded that the scale of capital flight in China has been greatly affected by the effective exchange rate of RMB, the difference between domestic and foreign asset returns, and the speed of domestic economic growth from the 1990s to the present.

Keywords: Capital Flight, VAR Model, BOP.

1 INTRODUCTION

Since the 1980s, economic globalization has become an important driving force for world economic development. The huge cross-border capital flow enables the international economic resources and natural resources to be allocated more reasonably and effectively, which effectively improves the economic production efficiency and profit rate of various countries. At the same time, the disorderly flow of large amounts of short-term capital has also caused great difficulties to the economic and financial security of various countries.

For China's reform and opening up, China has implemented the positive opening policy, given preferential policies to foreign capital enterprises, attracted and used a lot of foreign capital, and kept China growing at a high speed. At the same time, China's foreign trade shows a sharp increase in exports, and there is a large surplus in the current account in the Balance of Payments, and even a double surplus in the current account and the capital and financial account in some years. However, in the errors and omissions of the balance account, there are a large number of debits, which is known as capital outflow or capital flight by economists.

Although from 1978 to 1990, China's balance of payments also appeared relatively large ratio of errors and omissions accounts to the current account, but the scale of errors and omissions is not very large. From 1990 to 2001, there was a continuous outflow of capital, during which the total outflow reached 147.8 billion US dollars,

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indicating that China's capital flight phenomenon is very serious. From 2002 to 2008, the errors and omissions in the balance of payments of China appeared in the credit, showed that capital flight having disappeared in our country. The deep-rooted reason is that there is a huge double surplus in the current account and the capital and financial account, and the expectation of people's appreciation is becoming more and more strong. The large scale inflow of short-term hot money makes the capital flight performance very small. After the 2008 financial crisis in the United States, the economic and financial environment in China and abroad has been constantly changing, the risk aversion has been heating up, and multinational corporations and international financial institutions have redistributed their assets in the world, resulting in a large number of abnormal cross-border capital flows in the world. From 2009, China's balance of payments balance sheet has a large amount of errors and missing debit items, and shows a trend of expanding year by year. From 2015 to 2021, the total size of borrowings reached $1,316.2 billion.

From 2010 to now, real estate prices and labor prices have been rising continuously, which has led to the increasing cost of manufacturing and the continuous decline in the growth rate of China's GDP. All these have made domestic and foreign investors generally pessimistic about China's future economic situation, which has triggered the concerns of domestic capital holders to a certain extent. Some capital holders are pulling money out of the country. At the same time, with the deepening of the internationalization process of RMB, China has expanded the cross-border flow mode and stimulated capital flight while improving the openness of capital and financial accounts.

From the external environment, the world economy has entered a recovery stage, the United States, the European Union and other major economies have been growing at a new high in recent years. The Federal Reserve began to raise interest rates, which led to the appreciation of the US dollar, because RMB at a large extent get tight with US dollar, it will make depreciation of the renminbi against the US dollar, and will reduce the future expected returns of capital in China, causing more domestic capital to flee China. A large amount of capital flight will not only affect the stable development of China's economy, but also lead to a series of negative effects. In the current complex domestic and foreign economic situation, it is necessary to study the problem of capital flight in China. It is very important and practical significance to prevent large scale of domestic capital flight, make better use of domestic and foreign capital, and maintain stable economic development.

So, we make an effort to study the capital flight in China. Although the direct measurement method which usually underestimating the scale of capital flight in this paper, the capital flight in China is very seriousness between 1993 -2002 and between 2008-2023. We can roughly know the serve situation from the ratio of errors and omissions to current account and the scale of net errors and omissions. We can find in this paper there four factors influencing capital flight in China. The depreciation of RMB, growth of GDP declining in China, the spread of capital return between American’s and China’s long term treasury bonds, and the most important economic country’s currency value vibrating are the main important four factors on capital flight in China.

2 LITERATURE REVIEW

2.1 The Meaning of Capital Flight and It's Measuring Method

There is no consensus in academic circles on capital flight. Kindleberger (1937) interpreted capital flight as a panic capital transfer caused by the capital holders' suspicion and distrust of a country's economy or politics, which is an autonomous short-term capital flow[1]. According to Cuddington (1987), capital flight refers to the capital outflow caused by high tax, strict capital control or the expectation of devaluation of the domestic currency, with a huge risk of political or financial crisis[2]. Lessard and Williamson (1987) believe that capital flight is essentially an enterprise or individual caused by abnormal risks (such as exchange rate depreciation, domestic hyperinflation, capital control, etc.), which is caused by enterprises or individuals to avoid abnormal risks[3]. This kind of capital flow includes short-term capital flow and long-term capital flow.

Since there is no universally accepted definition of capital flight by scholars, and this abnormal capital flow itself has a strong concealment, the definition of capital flight is different. The measurement methods and results are also very different. In general, there are three different methods to estimate capital flight scale: the direct measurement method, indirect measurement method and mixed measurement method. Cuddington (1987) first proposed the "net error and omission method of balance of payments" to measure the scale of international short-term capital flows[2]. The scale of capital flight is directly represented by the net error and omission in the balance of payments (" positive value "is the inflow of hot money, and" negative value "is the capital flight). This measurement method is simple and direct. But the causes of net errors and omissions are complex, which may be caused by incomplete data, inconsistent statistical time and conversion standards. In addition, capital flight may also flow out through goods trade, services trade, capital and finance, which are not included in the net errors and omissions. The indirect method was first proposed by the World Bank (1985), and its formula can be summarized as follows: total capital flight = increase in foreign debt + net inflow of foreign investment - current account deficit - change in reserves, which is different from the short-term capital outflow measured by the direct method. The indirect measure covers all net increases in private sector assets. The mixed measurement method is the fusion of direct and indirect measurement methods, which was proposed by Dooley (1986)[4]. This method emphasizes that residents do not declare external claims. Since the data of this method is difficult to obtain, direct and indirect measurement methods are mostly used in estimating capital flight.

In this paper, for the difficulty to obtain suitable data which represent capital flight variable and its factors, we use direct measuring method to calculate capital flight in this paper.

2.2 Influencing Factors of Capital Flight

The academic circle has studied the factors affecting capital flight for many years, and has formed a complete theoretical system. Kindleberger (1937) believed that capital flight was influenced by interest rate, thus investors driven by interests usually made

capital flow from countries with low interest rate to countries with high interest rate[1]. Sheets (1996) proves that capital flight is affected by investors' capital wealth stock and psychological expectations through the establishment of asset portfolio model[5]. Ndikumana and Sarr (2019) studied the determinants of capital flight in 30 sub-Saharan African countries from 1970 to 1976 (including 24 low-income countries with severe debt) and found that external borrowing was significantly correlated with capital flight[6]. This suggests that much of the capital flight is debt-fueled. Korinek (2018) examines the regulation of capital flight in financial crises [7]. Ogrokhina and Rodriguez (2024) find that in developing countries, inflation targeting has a pro-cyclical inhibitory effect on capital inflows[8]. Kumar Pradhan et al (2024) find that the current capital flight of BRICS countries is increasing, and it is believed that this phenomenon comes from the decline of financial confidence[9]. Ndikumana and Sarr (2019) further analyze the impact of FDI, natural resources, and institutional change on capital flight[10].

3 VARIABLES AND DATA

According to the analysis of the causes of capital flight by domestic and foreign scholars, combined with the stage characteristics and influencing factors of capital flight in China, this paper takes the economic growth rate, the difference of long-term Treasury bond yield between China and the United States, the US dollar exchange rate index and the effective exchange rate of RMB as the main factors affecting capital flight, and uses the econometrics method to make an empirical analysis of the relevant factors.

3.1 Dependent Variable and Data

Considering the availability of data and sample size, as well as the absolute scale of capital flight, the period of data selection in this paper is 2000-2023. At the same time, considering the availability of data of various variables, we use the quarterly data of China's 2000-2023 time series data as the sample for empirical analysis. Considering the availability and matching to various variables of data, we use the direct measurement method for the explained variable capital flight which we name it as CFL. The data are derived from the BOP's errors and omissions published on the website of China's State Administration of Foreign Exchange (SAFE), with negative symbols indicating capital outflow and positive symbols indicating capital inflow (see Fig. 1).

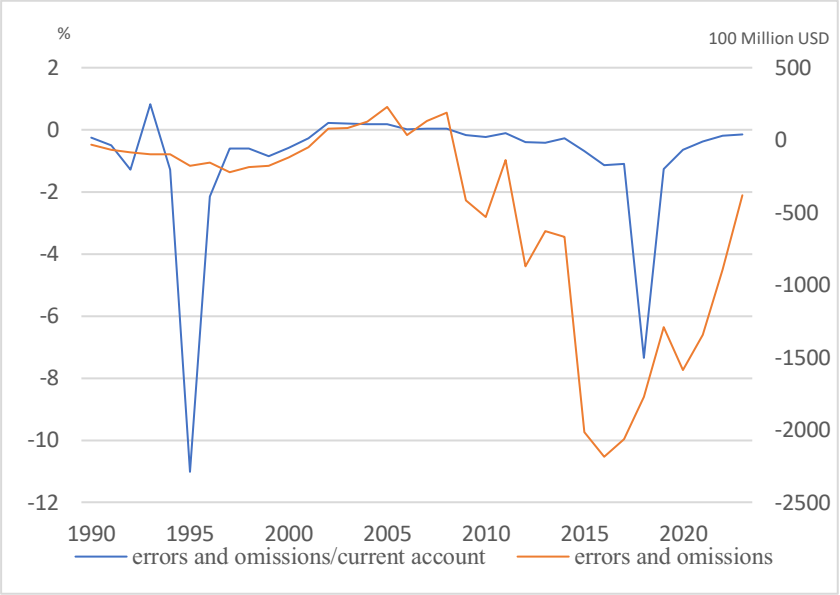

Fig. 1. 1990-2023 trend of errors and omissions

3.2 Explanatory Variables

Firstly, capital flight depends on such as: macroeconomic stability, the ability to attract foreign capital, the impact of the external economic environment, the revaluation of the domestic currency. Macroeconomic stability determines the risk of investment capital. A country's large economic quantity means Its capital markets have plenty of liquidity. The higher its economic growth rate and the better the country's economic development prospects, the more it can attract international capital. Therefore, GDP is introduced into the model as an explanatory variable in this paper.

Secondly, for the international capital flight , the return of investment is a very important aspect to be considered. The higher the return on investment of a country, the stronger the ability to attract foreign capital. A large amount of investment capital will flow into the country and the smaller the scale of capital flight will occur. On the contrary, when the level of foreign investment appears less attractive, investors will transfer a large amount of capital to the country with a higher yield level for the purpose of profit, resulting in large-scale capital flight. Therefore, this paper chooses the spread of long-term Treasury bonds between China and the US as an explanatory variable. In this paper we name this variable as R .

Thirdly, the degree of influence by the world's economic powers always affects the capital flight in a country. For a highly open country, its economic development is bound to be affected by its important economic partners. As an important economic partner of China, the United States treasury bond is the most important part of China's foreign exchange reserves, and the change of the US dollar index will have an important impact on the short-term flow of Chinese capital. In this paper, the US dollar index

(labeledUDI in this paper) is introduced into the model as an explanatory variable as an external influencing factor affecting China's capital outflow.

Fourthly, a country's currency depreciation will affect the capital flight. When a country's currency appears depreciation, the assets denominated the country's currency will suffer loss for international capital which invested in the country. Thus the revaluation of the value of the domestic currency will inevitably cause the flow of capital between the domestic and the outside world. Therefore, the effective exchange rate of RMB (labeled EY in this paper) is taken as the explanatory variable.

4 MODEL AND EMPIRICAL ANALYSIS

Based on the above analysis, the measurement model we built is as follows:

$$CFL = a + \beta_1 GDP + \beta_2 R + \beta_3 \mathrm{UDI} + \beta_4 EY + \mu \quad (1)$$

Among them, CFL is the dependent variable capital flight. We know that although the direct estimation of capital flight is not very accurate, for that it tends to underestimate. We use direct estimation of capital flight as the way to estimate capital flight volume. As shown in figures 1, the scale of capital flight from China is also not small.

A country's GDP size can represent the economic strength of a country, and the GDP growth rate can represent the country's economic prospect. R in the model represents the difference between long-term Treasury bond yields in China and the United States, a variable that affects the global allocation of capital. In the model, EY represents the effective exchange rate of RMB and the valuation of the intrinsic value of RMB in the international monetary system, which will also affect the flow of capital at home and abroad. a is the constant term, β_i $i = 1,2,3,4$ is the coefficient of each explanatory variable, μ is the random error term. The data for the above variables are from the website of the Bank for International Settlements, the website of the State Administration of Foreign Exchange of China and the website of the National Bureau of Statistics of China.

In order to avoid the problem of "spurious regression" in time series analysis, the stationarity of each time series should be essential. In VAR model, ADF test method is generally used to check whether the time series has stationarity. The results are shown in Table 1. Table 1 shows that CFL are stationary series, EY, $UDI$and R are all non-stationary series. But their first-order difference are stationary series at the significance level of 5%.

Table 1. Variables ADF Test

Variable	Test	ADF statistic
CFL	(C,0,0)	-6.343***
Δ CFL	(C,0,0)	-12.934***
lnGDP	(C,T,0)	-12.878***
Δ lnGDP	(C,T,0)	-16.478***
EY	(C,T,0)	-0.543

Δ EY	(C,T,0)	-8.315***
UDI	(C,0,0)	-2.525
Δ UDI	(C,0,0)	-12.959***
R	(C,T,0)	-1.125
Δ R	(C,T,0)	-7.003***

Note: The test type (C,T,K), where C and T represent the constant term and the time trend term respectively, and K represents the hysteretic order used in the final determination. The hysteretic order is determined according to the minimum criterion of SIC value. *, **, *** correspond to the significance level of 10%, 5% and 1% respectively.

An important problem in the establishment of VAR model is that the lagged order to be determined. Considering the relatively small degree of freedom of time series, the maximum lag order is selected as 4 in this paper, and the test results are shown in Table 2. According to the test results, five test criteria (LR, FPE, AIC, BIC and HQ) show that the optimal lag order of VAR equation is 4, so the lag order selected in this paper is 4. That is, in the VAR model, any variable can be explained by its own and other variables' lag 4 period values.

Table 2. VAR Optimal Lagged Term

Lagged term	LogL	LR	AIC	BIC	FPE	HQ
0	-912.203		37.4368	37.6299	1.2e+10	37.5101
1	-793.014	238.38	33.5924	34.7507	2.70E+08	34.0319
2	-778.599	28.832	34.0244	36.1479	4.30E+08	34.8301
3	-750.271	56.655	33.8886	36.9773	4.10E+08	35.0605
4	-592.511	315.52*	28.4698*	32.5237*	2.1e+06*	30.0079*

Based on the results of the optimal lag order test in Table 2, the five information criteria all support the model with a lag order of 4. We conduct the Granger causality test. The test results are shown in Table 3. It can be seen from the table that $lnGDP$ is the Granger cause of CFL at the significance level of 1%. EY is the Granger cause of CFL at the significance level of 5%. The four explanatory variables have joint significance at the 1% level. $lnGDP$ is the Granger cause of CFL at the significance level of 1%. EY is the Granger cause of CFI at the significance level of 5%. The four explanatory variables have joint significance at the 1% level.

Table 3. Granger Causality Test

results	causality	Wald statistic
CFI	R	.00014
CFI	lnGDP	21.971***
CFI	EY	5.0248**
CFI	UDI	1.0443
CFI	All	38.55***

Further, we use the Johansen test for multivariate tests to determine whether there is a long-term cointegration relationship between CFL and explanatory variables. The test results are shown in Table 4. It can be seen from the table that the trace statistic of cointegration rank 2 is significant at the 5% level, indicating that there are two linearly

independent cointegration vectors. At the same time, the maximum eigenvalue test also significantly rejects the null hypothesis that there are no linearly independent cointegration vectors. It shows that there is a long-term cointegration relationship between variables.

Table 4. Cointegration Test

H_0	maximum eigenvalue	5% significance	Trace statistic	5% significance
0	70.2228	36.41	125.9546	77.74
At most 1	25.6464	30.33	55.7318	54.64
At most 2	16.1291	23.78	30.0854*	34.55
At most 3	12.5586	16.87	13.9564	18.17
At most 4	1.3978	3.74	1.3978	3.74

Further analysis of the impulse response function shows that, as shown in Figure 2, when the change in EY has a positive shock of one standard deviation, it leads to a negative change in the CFL in the next period. As shown in Figure 3, when there is a positive shock of one standard deviation in the change of lnGDP, thereis a significant positive change in C FL in the third period.

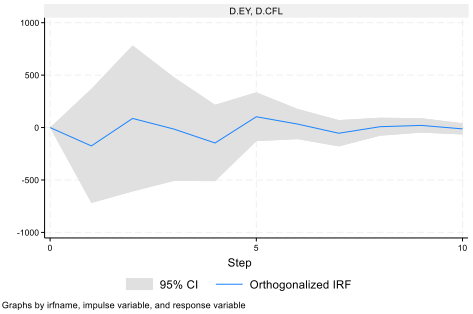

Fig. 2. impulse response D.CFL to D.EY

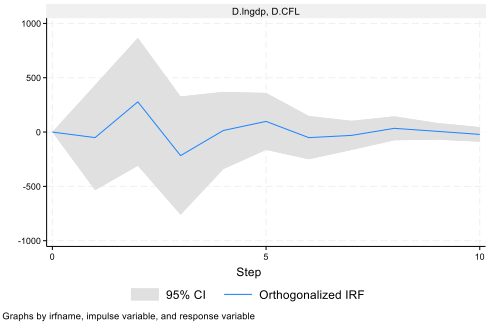

Fig. 3. impulse response D.CFL to D.lngdp

The stability test of the above VAR model is shown in Figure 4. The test results show that all the eigenvalues lie inside the unit circle.

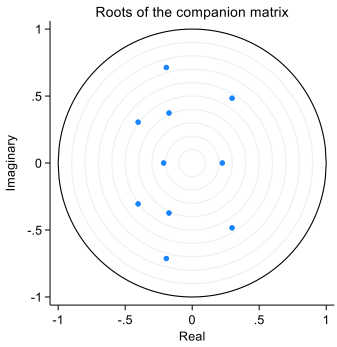

Fig. 4. Stability Test of the VAR Model

5 CONCLUSION

First of all, China's capital flight and exchange rate changes, the difference in the yield of long-term financial instruments in the capital market at home and abroad, domestic economic growth changes are interdependent. The regression relationship shows that the variables form a long-term equilibrium, and their economic interaction is not a short-term interaction, but a long-term stable relationship.

The depreciation of the local currency exchange rate will intensify the positive impact on capital flight. Once the currency depreciates sharply, huge capital flight may be caused, resulting in a large outflow of funds. The change of GDP growth rate also has the opposite effect on capital flight. Once the domestic economic growth rate is reduced, it will certainly bring about the intensification of capital flight. According to the data of capital flight measured by the direct method, capital flight intensified significantly from 2014 to 2024, especially from 2016 to 2017 in China. Therefore, when the domestic economic growth rate is slowing down, China's foreign exchange management agencies should strengthen the supervision of capital flight to prevent the risks of the financial system caused by large-scale capital flight. When the exchange rate of the most important international currency fluctuates, it is necessary to take measures to prevent capital flight in a timely manner and maintain domestic financial security.

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