THE EFFECT OF CAPITAL ACCOUNT OPENNESS AND INSTITUTIONAL QUALITY ON CAPITAL FLIGHT : FINDINGS FROM BRICS

By

YU, Boya

THESIS

Submitted to

KDI School of Public Policy and Management

In Partial Fulfillment of the Requirements

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ABSTRACT

THE EFFECT OF CAPITAL ACCOUNT OPENNESS AND INSTITUTIONAL

QUALITY ON CAPITAL FLIGHT: FINDINGS FROM BRICS

By

Boya YU

This paper studies the effect of capital account openness and institutional quality on capital flight. It takes BRICS countries as the research object by using panel data during 2000-2015 and reviews capital account openness through three angles, including overall indicators, capital inflow sector and capital outflow sector. The study shows that the improvement of overall capital account openness does not lead to an increase in capital flight. On the contrary, it acts as a restraint. Increase in capital outflow openness will promote capital flight while the increase in capital inflow openness will curb capital flight. As BRICS has done well in controlling speed and depth of capital openness in both inflow and outflow, the overall inhibitory effect is higher than promoting effect. In the process of capital account openness, improvement of institutional quality, especially legal system concerning contract protection and property right protection, can effectively reduce capital flight. The findings can provide some reference for China's policy reform being implemented at the moment.

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Dedicated to Zhizhong Yu, my dear father

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I. INTRODUCTION

1.1   Statement of the Problem

For a long time, capital flight phenomenon in developing countries has attracted the attention of many scholars. Capital flight usually refers to the phenomenon that capital flows from domestic to overseas due to economic, political, war and other factors. On the one hand, many developing countries have experienced a rapid growth of economy and performance of BRICS (five emerging countries consist of Brazil, Russia, India, China and South Africa) is particularly prominent. BRICS has been growing rapidly at the level significantly higher than world economic growth rate in the past few decades, among which China's average GDP growth rate is 9.96% during 1990-2015 while India, Russia, Brazil and South Africa have also achieved rapid economic growth in the ten to twenty years; On the other hand, these countries have or are implementing capital account openness along with economic growth. The relaxation of capital account control has facilitated the free flow of capital and created conditions for capital flight. For recent ten years, "net errors and omissions item" in the balance of payments of BRICS have been negative for a long time, although we can't wholly classify the net errors and omissions as capital flight, but it shows that capital inflows are more than capital outflow recorded in the balance of payments which implies there exists hidden capital outflows, reflecting these countries suffered a specific size or relatively frequent capital flight in the past few years.

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China has accelerated the pace of liberalizing capital market in the past few years, including lowering QFII and QDII threshold, opening RDII and improving RQFII limit. "The people's bank of China annual report 2015" released on June 21, 2016 clearly put forward that the central bank will focus on promoting personal investment facilitation and capital market two-way open, releasing pilot of qualified domestic individual investors overseas investment system (QDII2) at appropriate time and allowing qualified high-quality foreign companies to issue stocks in China in the near future. China launched the Shenzhen-Hong Kong stocks connect on December 5, 2016. However, with the progress of capital account openness, the size of China's foreign exchange reserves dropped sharply from a peak of US $3.99 trillion in 2014 to US $2.99 trillion by the end of January 2017. It has aroused the concern of scholars about the capital flight phenomenon of China and the discussion on whether China needs to continue to accelerate the opening of the capital account.

1.2 Research Questions

Why do BRICS still suffer capital flight in the context of economic growth? Is capital account openness the leading cause of capital flight? Although the answers to these questions involve many aspects and factors, the primary institutional characteristics of a country in legal, political and other aspects should not be ignored. Based on this, this paper will focus on the relationship between and among capital account openness, institutional quality and capital flight. This paper will answer two questions: First, is the increase in capital account openness the cause of

capital flight in BRICS? Second, under the premise of considering capital account openness and other economic factors, will the quality of a country's institution have a significant impact on capital flight?   If so, in what direction?

1.3   Organization of the Paper

The rest of the paper is organized as follows. Section 2 will review mechanism and previous research concerning with the impact of capital account openness and institutional quality on capital flight. Section 3 explains the research methodology and presents empirical results with discussion. Section 4 concludes and provides suggestion.

II. LITERATURE REVIEW

2.1 Capital Account Openness and Capital Flight

2.1.1 The Impact Mechanism of Capital Account Openness on Capital Flight

Capital account openness refers to a series of policy actions to relax or even cancel the control of cross-border transactions and capital transfer as well as foreign exchange control related to capital transactions. Capital account liberalization can play a positive role in a country's economic development, but may also cause damage to a country's economic development. It may cause inhibition in the capital flight, may also increase the capital flight.

Regarding the positive impact, capital account openness can provide convenient international investment and financing channels to promote the cross-border capital flows. For developing countries or emerging market economies, international capital through direct investment or indirect investment has promoted the exchange of domestic and overseas production and technology. The advanced technology and production tools improve the production process of enterprises and labour productivity. Cross-border capital flows also expand the trading subjects of the domestic financial market, enrich the demand and supply of financial transactions, promote the mutual integration of domestic and foreign financial markets, and help improve the operational efficiency of the domestic financial market. Besides, overseas investment demand promotes the innovation and development of financial

products and improves the efficiency of financial resources allocation. From this point of view, the positive impact of capital account openness on the economy will restrain capital flight of a country to some extent.

However, liberalization of the capital account may also have a negative impact on economic development and financial stability and then trigger capital flight. When a country's domestic financial market assets pricing power is insufficient while there is irrational investment behaviour in domestic investors at the same time, influx of capital will gather in some short-term fickle kinds industry (for example, the real estate market or the stock market) after opening capital account, which can cause asset bubbles and damage to the domestic entity economic development. Once the economy encounters the international investment environment mutation or internal economic problems, short-term speculative capital will reverse to flight. When the speculative foreign capital attacks the local currency, it will inevitably lead to the depreciation pressure of the local currency, and a large number of capital flight will aggravate the depreciation of the local currency. If the government wants to maintain the stability of the exchange rate, it is bound to use the foreign exchange reserves to intervene in the foreign exchange market, which will lead to the loss and depletion of the foreign exchange reserves of the country, eventually leading to the currency crisis and even the international financial crisis. The 1997 Asian financial crisis, which began with Thailand's premature capital account opening, is a classic example.

2.1.2   Empirical Findings

In the early stage, the research on the influencing factors of capital flight mainly focused on economic, such as interest rate spread, exchange rate change, inflation rate. Accompanied by gradually liberalization of the capital account in each country, related research on the impact of capital account openness on capital flight began to appear. Among these studies, parts of the literature thought that an increase in capital account openness would reduce the magnitude of capital flight. Scholars holding this view believe that residents living in a closed economy can only use some illegal means to transfer capital abroad. Opening capital account can make capital flow channels and ways freer and easier (Mody & Murshid, 2002), and residents will regard the opening of capital account as a signal of a country's government's confidence in controlling its economy, thus reduce capital flight (Kose, 2008); Some literature also points out that capital account openness can show that a country's government has ability to reasonably use fiscal policy and monetary policy to adjust external imbalances (Obstfeld, 1998; Stiglitz, 2000). As a result, capital account openness will reduce the scale of capital flight. Other parts of literature argue that the improvement of capital account openness will lead to expansion of capital flight from a risk point of view. Capital account openness will bring much uncertainty to domestic economic stability, and the possibility of financial crisis will be significantly increased. It led to investors' concerns and increase capital flight (Epstein, 2004).

Some scholars use empirical methods to study whether capital account openness affects capital flight, but there are no consistent research conclusions. It is related to the selection of indicators and samples of capital account openness. Regarding de jure indicators used to measure capital account openness, studies using Chinn - Ito indicators have concluded that magnitude of capital flight has nothing to do with the openness of capital account, including Yalta (2012)'s use of Granger Causality Test on 21 emerging economies to inspect the panel and Hermes & Linsink (2014)'s using linear panel model for 18 African countries' annual research data; Other nominal indicators of openness lead to different conclusions. Cheung & Qian (2010) uses a binary dummy variable to represent China's capital control policy. Through the Granger Causality test, it found that there is no significant statistical relationship between the magnitude of China's capital flight and the degree of capital account control. However, He Juanwen (2005) found that capital control has a significant inhibiting effect on China's capital flight by using the same way. Regarding measuring the openness of capital accounts by using de factor indicators, Lensink et al. (1998) treated flight capital as an asset, built a portfolio model, and conducted empirical tests on 9 African countries using linear panel data. It found that capital flight scale could be reduced by increasing capital account openness, but the impact was small. Huang Wei and Peng Zhenshan (2006) decomposed economic openness into four categories: commodity trade openness and service openness under the current account, direct investment openness and indirect investment openness under capital account. It applied vector autoregression method (VAR) to do the empirical

test and found that the increase in openness of these four factors led to the increase of capital flight scale.

2.2 Institutional Quality and Capital Flight

2.2.1 The Impact Mechanism of Institutional Quality on Capital Flight

Institution is a series of underlying political, social and legal rules used to establish the foundation of production, exchange and distribution, which constitute the incentive mechanism of people's trading behaviour. Institutional quality refers to the degree to which the code of conduct represented by the system is accepted and its binding force. The higher the qualities of the institution, the higher the compliance degree of people to the system, the less likely the opportunistic behaviour in the transaction, the less the uncertainty of the transaction consequences and the more stable the expectation of the transaction subject. How do institutional factors affect capital flight? Theoretically, it is believed that the quality of the political system and legal system will affect investors' expectation of future returns, and then affect capital flight. Due to the lack of research on the impact of legal system quality on capital flight, this paper mainly analyzes the mechanism of the impact of legal system quality on capital flight.

Transaction cost is a critical factor in the transmission mechanism of legal system affecting capital flight. Sound property rights protection system can reduce the cost of the transaction through the following two ways: first, it can reduce the

uncertainty of the transaction. A sound property rights protection system has a clear definition of property rights and can prevent the occurrence of friction and disputes in the market in advance. Therefore, it can reduce market transaction costs, facilitate transaction behaviours and improve transaction efficiency. Second, it can reduce opportunism. Opportunism means that people seek to maximize their personal interests through improper means. A good property rights protection system establishes rules and norms for property rights trading through reasonable arrangement of trading contracts to restrain and punish various opportunistic behaviors in the trading process, clarify the rights and obligations of both parties, urge all parties to abide by the contract rules, and reduce the transaction costs caused by non-compliance with the contract.

Investment efficiency is also an essential factor that the legal system affects capital flight. A perfect investor protection system can provide corresponding system protection for investors to make a cross-market capital investment and enjoy financial services such as financial institution information consultation, to provide an excellent financial investment environment for investors and improve the investment efficiency. Literature shows that the higher the quality of investor protection system, the better the investment effect. La Porta et al. (1997, 1998) found that in countries with strong investor protection, the financial market is relatively developed which can provide investors with more alternative financial instruments and better diversify portfolio risks. La Prt et al. (2000) found that investors can obtain higher dividends in countries with reliable investor protection.

Sound property rights protection system and the commercial law system play a decisive role in reducing transaction costs, improving transaction efficiency and investment income from the legislative level. Judicial system of high quality ensures the effective implementation of legislation from the level of law enforcement. Abundant lawyer resources, high-level court team and sound judicial system provide a reliable guarantee for the efficiency and fairness of law enforcement. A judicial system with credibility also provides incentives for economic exchanges.

2.2.2   Empirical Findings

There are few empirical studies on the relationship between institutional quality and capital flight, and especially there are few institutional factors involved in the studies on China's capital flight.

Among limited literature, there are many studies on the relationship between the quality of the political system and capital flight, the government's control system of economic activities and capital flight, but few studies related with legal systems such as protection of property rights. Lensink et al. (1998) used the data of 84 developing countries and empirically tested the relationship between political risk and capital flight by setting virtual variables such as murder rate and revolution, political rights. It found that most of the political risk variables keep significant statistical relationship with capital flight. Some literature thought political risk resulted in capital flight through insurance premium losses and asset loss related to

investment (Davies, 2008; Ndikumana, 2014). Hermes & Lensink (2001) investigated the relationship between the government's control of economic behaviour and capital flight and believed that the uncertainty of policies was an essential reason for capital flight. If intentions of government's policy were vague, domestic residents would prefer to transfer capital to foreign countries where the return on assets was more defined. They used fiscal expenditure, tax expenditure, government consumption, inflation and the real interest rate data and built the five policy uncertainty index by methods of time trend expanded second-order autoregressive, found that there are four indicators of uncertainty significantly positively related to capital flight in addition to inflation. It concluded that the higher the uncertainty of policy, the larger the magnitude of capital flight.

Cera et al. (2008), Asongu & Nwachukwu (2016), etc. have taken a variety of institutional factors into account. Cerra et al. (2008) used the panel data to study the relationship between institutional quality and capital flight by introducing multiple indicators in the database system, including bank governance index, corruption, policy formulation and implementation quality, political stability, laws and regulations. The results showed that the lower the quality of the institution, the bigger the capital flight, and institutional quality affect capital flight by influencing the volatility and uncertainty; Asongu & Nwachukvu (2016) used the panel data of 37 African countries to study the effect of institutional quality on capital flight. After examining six kinds of institutional quality, it found that three indicators including political stability, freedom of speech and freedom of the election to vote

as well as corruption control has significant inhibitory effect on capital flight. Among all indicators, the negative correlation between the quality of corruption control and capital flight is the most robust.

Chinese scholars have also done some studies on the relationship between institutional quality and capital flight. Cao Yuantao (2005) analyzed the influencing factors of capital flight in China from 1985 to 2002. The paper used Corruption Perceptions Index of Transparency International to measure the degree of political corruption in China and roughly measured the reform of China's property rights system by the ratio of the total industrial output value of public ownership to total industrial output value of whole society. The results showed that the cleaner the politics, the less capital flight; the property right system has a significant impact on capital flight. If the property right system cannot meet the requirements of manufacturers, capital flight will occur. Pan Zhen and Jin Zhongkun (2008) used stepwise regression method to test the relationship between institutional constraints and capital flight in China from 1982 to 2006. It used the percentage of the value of securities held by residents accounted for total value of residents' financial assets as a measuring index of the degree of private property rights protection in China. Other institutional constraints include domestic and foreign discrimination policy, corruption, foreign exchange control and the degree of marketization. The results showed that the degree of private property right protection, foreign exchange control and marketization by Chinese government are negatively correlated with capital flight. However, the sample size of these two studies is small, and the

conclusion needs to be further tested.

III. EMPIRICAL TEST

3.1   Model Specifications

The benchmark model (1) for the relationship between and among capital account openness, institutional quality and capital flight of BRICS can be expressed as follows:

$$\mathrm{CF}_{i,t} = \beta_1 OPEN_{i,t} + \beta_2 IQ_{i,t} + \beta_3 X_{i,t} + e_{i,t} \qquad (1)$$

(1) CF — scale of capital flight/GDP

This paper argues that capital flight does not depend on the number of its routes, but up to whether it is speculative. The typical characteristic of capital flight is that it will quickly transfer to foreign countries once the expected return or risk changes. Therefore, short-term speculative capital is an important part of capital flight. In this paper, the direct calculation method of J. Cuddington (1986) is adopted to calculate the scale of capital flight:

Scale of capital flight =-(net error after deducting statistical errors and the scale of omitted bond and equity investment)

The sign of item in the formula is the same as balance of payment. Net errors after deducting statistical error and omissions item represents a hidden capital flow. Normal statistical error is estimated by the proportion of net errors and omissions item in the balance of payments accounts for total trade volume in the United States and Japan because these two countries' balance of payments statistics system is

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relatively perfect (Ren Hui, 2001). Under capital account liberalization, bond and equity investment, as an important means of outward investment, are highly liquid and speculative. Large-scale short-term flows will affect the stability of a country's financial market. Therefore, this paper takes them as the representative of short-term speculative capital.

(2) OPEN — overall openness of capital account

There are two commonly used indicators to measure the openness of the capital account. One is the KAOPEN index constructed by Chinn-Ito, which belongs to the openness of laws and regulations. The other is measured by the ratio of capital stock or flow to GDP. Due to China's score from 1993 to 2014 has continuously been -1.188756943 under KAOPEN index, which remains unchanged. It does not reflect the fact that China's capital account openness is advancing steadily. Therefore, this paper adopts de factor openness degree of capital account:

OPEN= (direct investment assets + direct investment liabilities + securities investment assets + securities investment liabilities) /GDP

(3) IQ- institutional quality

It has always been difficult to measure institutional quality digitally. Therefore, it is crucial to determine an institutional quality indicator system suitable for transnational data research. In empirical studies, some institutional indicator systems are often adopted, including Worldwide Governance Indicators (WGI) provided by Kaufmann et al. (2011), multiple institutional quality indicators

including government size and property rights protection provided by Economic Freedom of the World (EFW) database, International Country Risk Guide (ICRG) provided by Political Risk Services Group (PRS), Polity IV provided by Marshall & Jaggers (2002), etc.

EFW database and WGI index system are comprehensive databases to measure the quality of the institution, providing both the quality of the political system and the quality of the legal system. Although ICRG and Polity IV database index are also widely used, they are generally applicable to study the quality of political systems. Among all indicators, the most frequently used one is WGI (Shao Jun and Xu Kangning, 2008). It is because WGI has higher rigour and comprehensiveness among all similar indicators and covers a broader range of countries. The high rigour is that WGI pays more attention to statistical accuracy. In addition to publishing the estimated value of system quality, it also emphasizes on and calculates the standard error caused by the estimation. Great comprehensiveness is embodied in that WGI data source is more extensive, not only including the government's official data released by the organization, but also the analysis of the business data and survey data, and absorbing indicators of published index system. For example, Rule of Law indicators of WGI has extracted related information with law and regulations from ICRG and then combine. Furthermore, WGI index covers a broader range of countries or regions. At present, the WGI index covers 213 countries and regions, while ICRG and other indexes only cover around 100 countries and regions. WGI index system has three dimensions, and there are two

sub-indexes under each dimension. The two sub-indexes are highly correlated, and there are six sub-indexes. The higher the value of the indicator in the WGI index system, the higher the system quality of corresponding dimensions. WGI indicator system measures three dimensions and six sub-indicators of system quality (see table 1).

Table 1: Description of Each Index in WGI

Dimension	Sub-indicator	Detailed Explanation
1. The process by which the government is selected, supervised and replaced	Voice and Accountability (VA)	Measures the degree to which a country's citizens are free to choose their government and speak freely
	Political Stability and Absence of Violence/Terrorism (PV)	Measures the stability and violence controlling ability of the existing government
2. The ability of the government to formulate and implement policies effectively	Government Effectiveness (GE)	Measures the degree to which administrative services and public services are not affected by political pressure as well as the credibility and strength of government commitment to implement policies
	Regulatory Quality (RQ)	Measures the government's ability to implement policies and regulations that enhance the development of the private sector
3. The level of the public and society respecting and complying with laws and regulations such as economic rules, social rules.	Rule of Law (RL)	Measures the degree to which public trust and compliance with laws and regulations, especially those relating to contract enforcement, property rights protection and the legal system
	Control of Corruption (CC)	Measures the extent to which public power is used for private gain, including corruption in its narrow and broad sense

Source: World Bank

The paper believes that contract protection, as well as property rights protection law

plays a vital role in investment activities, directly affecting the investment effect and behaviour. So the primary concern of institutional quality index is "RL" under WGI. At the same time, "PV" and "RQ" are selected according to data availability. Specifically, IQ includes: RL- measuring the public's trust in and compliance with laws and regulations, especially those relating to contract enforcement, property rights protection and judicial system; PV- measuring the stability and riot control capability of the existing government; RQ- measuring the government's ability to shape policies and regulations to allow and enhance private sector development. The score range of RL, PV and RQ is 0-100. The higher the value of the index, the higher the quality of the corresponding system.

(4) X- other control variables

Other control variables include:

A. Interest rate difference between country i and the international market (RD$_i$). It is equal to the money market rate of country i minus the international market rate, of which latter is replaced by the London interbank offered rate (Libor). The wider the spread, the investors' gain in the country i should be higher and capital flight should be reduced.

B. The Exchange rate of country i (Exchange). It is equal to (current rate - previous rate)/current rate of exchange of country i. Exchange rates are priced in U.S. Dollar Quotations. Therefore, Exchange> 0 indicates the depreciation of the country's currency.

C. Inflation rate (Inflation$_i$). It is equal to (current CPI- last CPI)/last CPI.

D. Economic Growth (Growth$_i$). It is equal to (current GDP- last GDP)/last GDP.

All the data in this paper are from the international monetary fund (IMF) and the World Bank, based on the availability and completeness of data, and the time span is 2000-2015.

3.2   Empirical Process and Result Analysis

3.2.1   Panel Unit Root Test

First, this paper conducted the unit root test of ADF panel on the data, and the test results of each variable were shown in table 2 and table 3.

Table 2: ADF Panel Unit Root Test Result of Major Variables

Variables / Statistics	CF	OPEN	RL	PV	RQ
chi2 (10)	39.77	37.47	27.74	29.72	24.23
Prob>chi2	0.000	0.000	0.002	0.001	0.007

Table 3: ADF Panel Unit Root Test Result of Control Variables

Variables / Statistics	RD	Exchange	Inflation	Growth
chi2 (10)	30.65	24.99	25.25	33.49
Prob>chi2	0.001	0.005	0.005	0.000

Table 2 and Table 3 show that all variables are stable at the 1% significant level.

3.2.2 Model Regression

According to the Hausman test results, model (1) should select the random effect model. In order to overcome the possible heteroscedasticity problems, all reported

standard errors have undergone heteroscedasticity correction, that is, the standard

error is robust to heteroscedasticity. Regression results of model (1) are shown in

column (1) of table 4.

Table 4: Regression Result

Estimation Method	RE	FE	System GMM
Model	(1)	(2)	(3)
$CF_{i,t-1}$			0.0465
			(0.0383)
OPEN	-0.308***	-0.215**	-0.397***
	(0.0585)	(0.0872)	(0.0799)
RL	-0.000928***		-0.000954***
	(0.000124)		(0.000149)
PV	1.56e-05		-0.000229
	(0.000188)		(0.000312)
RQ	2.13e-05		0.000593
	(0.000244)		(0.000410)
PP		-0.00474***	
		(0.00145)	
RD	-0.000416*	-0.000679**	-0.000744***
	(0.000232)	(0.000294)	(0.000274)
Exchange	0.000327***	0.000434***	0.000178
	(8.22e-05)	(0.000129)	(0.000229)
Inflation	0.000249	0.00101*	0.00113*
	(0.000425)	(0.000529)	(0.000606)
Growth	6.40e-07	6.44e-05	-0.000307**
	(0.000106)	(0.000156)	(0.000151)
Constant	0.0479***	0.0253**	0.0315**
	(0.0101)	(0.0103)	(0.0125)
Hausman Chi-square test	10.92	21.50***	
Statistics	[0.206]	[0.0003]	
Observations	80	75	75
R^2	0.598	0.687	
Arellano-Bond test for AR(1)			-1.894*
			(0.0581)
Arellano-Bond test for AR(2)			-1.0662
			(0.2863)
Sargan test			9.69067

(0.2068)

Notes: The standard errors are reported in parentheses. P-value is reported in brackets. ***, ** and * indicate significance at 1%, 5% and 10%, respectively. Values of Prob>Z are reported in parentheses in the Arellano-Bond test. Values of Prob>x^2 are reported in parentheses in Sargan test.

The test results of model (1) show that after controlling for relevant variables, the coefficient of overall openness of the capital account (OPEN) is negative and significant at the level of 1%, which indicates that the improvement of the overall openness of the capital account can significantly reduce capital flight. Coefficient of quality of legal system is negative and significant at 1% level, meaning that improve the quality of legal system can effectively reduce the scale of capital flight, this may be because the higher the quality of a country's legal system, the better property rights and investor protection, effectively reduces the irregularities in the process of trading, thus the more stable trading main body's expectations of trading results, resulting in lower transaction costs and investment security enhancement, which will eventually exert inhibitory effect on capital flight. Quality of political system (PV) and private sector development system (RQ) have no significant effect on capital flight.

3.2.3   Robustness Checks

In order to ensure the reliability of the empirical results, the robustness checking of the conclusion of model (1) was conducted. First of all, in the form of replacement index, Protection of Property Rights (PP) provided by EFW database was taken as another measure of the quality of the legal system. IQ in model (1) was thus set as

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PP and expressed as model (2):

$$CF_{i,t} = \beta_1 OPEN_{i,t} + \beta_2 PP_{i,t} + \beta_3 X_{i,t} + e_{i,t} \qquad (2)$$

The value range of PP is 0-10. The higher the number, the higher the quality of the system. Period is 2000-2014. PP shows robust after the panel unit root test. According to Hausman test results, model (2) should select fix effect model. Regression results are shown in table 4 (2).

Model (1) may result in endogeneity due to the omission of variables. In order to test whether the estimated results are affected by endogeneity, and given the possible inertia of capital flight, this paper adopts the dynamic panel model for further robustness test. The dynamic panel model (3) is set as follows:

$$CF_{i,t} = \beta_1 CF_{i,t-1} + \beta_2 OPEN_{i,t} + \beta_3 IQ_{i,t} + \beta_4 X_{i,t} + e_{i,t} \qquad (3)$$

Model (3) has the explanatory variable of first-order lag. If we use the general panel of the OLS regression, there will exist upwards biased and the inconsistent in estimation due to the existence of the endogenous variable. GMM estimation (Generalized Method of Moments) can effectively deal with the endogeneity problem in dynamic panel data. GMM estimation method is divided into system GMM and differential GMM. Compared with differential GMM method, system GMM estimation can improve the accuracy of model estimation and reduce the deviation caused by limited samples (Baltagi, 2013). Therefore, system GMM method is adopted here to estimate the model. Regression results of model (3) are shown in table 4 (3).

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The results of both robustness tests show that the coefficient sign and significance in capital account openness (OPEN) and legal system quality (PP, RL) of core explanatory variables do not change, and the regression results remained stable.It shows that the improvement of the quality of the legal system has steadily inhibited capital flight. The increase in the overall openness of capital account can significantly reduce the scale of capital flight.

3.2.4 An In-depth Analysis of Capital Account Openness to Curb Capital Flight

Capital account openness consists of inflows and outflow management. In order to further research on different direction openness' impact on capital flight, this article will decompose capital account openness into inflows and outflows two directions to analyze the impact of flow direction of capital account openness and institutional quality on capital flight.

Model (4) is set as follows:

$$\text{CF}_{i,t} = \delta_1 OUT\_OPEN_{i,t} + \delta_2 IN\_OPEN_{i,t} + \delta_3 IQ_{i,t} + \delta_4 X_{i,t} + e_{i,t} \qquad (4)$$

Where, OUT_OPEN represents the capital account openness in the outflow direction: OUT_OPEN = (direct investment assets + securities investment assets) /GDP. IN_OPEN represents the capital account openness in the inflow direction: IN_OPEN = (direct investment liabilities + securities investment liabilities) /GDP. IQ shall still use RL, PV and RQ three indicators in WGI system. Fixed effect was selected for model (4) according to the Hausman test result, and regression results

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are shown in Table 5.

Table 5: Regression Results of Decomposed Capital Account Openness

Estimation Method	FE
Model	(4)
OUT_OPEN	0.345*
	(0.185)
IN_OPEN	-0.608**
	(0.119)
RL	-0.00110**
	(0.000375)
PV	-4.36e-05
	(0.000344)
RQ	-6.75e-05
	(0.000302)
RD	-0.000784**
	(0.000322)
Exchange	0.000228*
	(0.000120)
Inflation	0.00146**
	(0.000551)
Growth	-0.000113
	(0.000134)
Constant	0.0713**
	(0.0197)
Hausman Chi-square test	19.83**
Statistics	[0.019]
Observations	80
R^2	0.687

The empirical results show that the coefficient of OUT_OPEN is significantly positive at the level of 10%. The coefficient of IN_OPEN is significantly negative at the level of 1%, and the absolute value of the coefficient is large. The coefficient of the quality of the legal system is still significantly negative at the level of 1%. The regression coefficients of the other two systems are still not significant. This shows that: first, the degree of openness in the direction of cross-border capital outflow is

positively correlated with capital flight, that is, the increase in the degree of openness in the direction of cross-border capital outflow will promote capital flight. Second, the openness of cross-border capital inflow direction is negatively correlated with capital flight, indicating that the increase of openness of cross-border capital inflow direction will restrain capital flight. Third, in the process of capital account liberalization, inhibitory effect to capital flight brought by the openness of capital inflow is greater than promoting effect brought by the openness of capital outflow due to better control of the direction, degree and speed of capital opening. This is also an important reason why the improvement of overall capital account openness can significantly reduce the capital flight in BRICS. Fourth, the quality of the legal system has played a steady role in curbing capital flight.

IV. CONCLUSIONS AND SUGGESTIONS

Based on the above research, the following conclusions and suggestions are drawn:

First, the increase in the overall openness of capital account is not the cause of the increase in capital flight. From the empirical results of BRICS, it can be seen that the capital account opening has a certain degree of inhibiting effect on capital flight. On the one hand, BRICS countries have shown that their governments have full confidence in maintaining their economic development and financial stability by opening up their capital accounts. On the other hand, as the five largest emerging market economies in the world, they have great potential for economic growth and their growing influence on the international arena in recent years, which are very attractive for international capital investment. As early as IMF's research on emerging market countries in 2011, it pointed out that the trend of large-scale capital flows is caused by changes in external conditions of the international financial market, and external factors are uncontrollable. Internal factors, such as economic growth, balance of payments, and participation in the international market, have little effect on the trend of capital flows but can determine the scale of domestic capital flows. Therefore, in the process of capital account opening, promoting the steady development of the domestic economy, maintaining an appropriate balance of payments surplus and relative stability of the domestic exchange rate are the critical factors that ultimately inhibit capital flight.

Second, reasonable control of the direction, extent and speed of capital account

opening plays a crucial role in curbing capital flight in the process of capital liberalization. In recent years, the internationalization of RMB is proceeding in an orderly manner. At present, a new round of reform and opening up has been launched in China. Further opening-up, including capital account, is inevitable, but it will also bring new problems and risks. In terms of further opening of the capital account, great emphasis should be placed on match among openness degree of capital inflows & outflows and speed, and match among capital opening, financial supervision and financial law system construction level besides paying attention to the order and steps of capital account liberalization. So we can not only introduce the use of international capital but can also prevent capital flight and its impact on financial markets mostly.

Third, the improvement of institutional quality will significantly curb capital flight. The improvement of legal system quality means the reduction of law enforcement cost and the enhancement of law enforcement effect. A sound property right protection system can effectively protect the investment results of investors and ensure the safety of investment assets. A sound financial law system is the basis of guaranteeing investment behaviour in the financial market (protecting investment in stocks, bonds, financial derivatives and other financial instruments), as well as an essential part of a mature and competent financial market. Therefore, it is vital to perfect the legal system, especially the laws and regulations concerning contract protection and property right protection, as well as the commercial law system concerning investor protection in the new round of financial liberalization in China.

In addition, other institutional developments such as improving the quality of administrative and public services and controlling corruption should also be carried out simultaneously. These measures will play a decisive role in restraining capital flight or preventing large-scale capital movements.

Fourth, we shall pay attention to the supporting and coordination of reform measures in China. Among the control variables, interest rate differentials and economic growth rate are significant at least at 5% level against capital flight, and the inflation rate is significant at 10% level. Therefore, we suggest that we must pay attention to the coordinated reforms: further opening of capital projects, interest rate, exchange rate, market reforms, RMB exchange rate system reform, the implementation of the strategy and the internationalization of the Renminbi should be implemented coordinately with overall reform of the financial regulatory system and legal system in China so as to improve the efficiency and effect of China's capital account opening.

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