The Growth Effect of Capital Account Opening

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Based on global data of 144 countries, this paper uses a panel data model to analyze the growth effect of capital-account opening. Furthermore, through the comparison of regressions of different income level, this paper also discusses the threshold effect and mechanism of capital-account opening. The empirical results show that, in the case of complete sample, capital-account opening has a negative effect on economic growth. However, according to the regressions of different income level, the income of 4500 dollar can be viewed as a dividing line, above which, capital-account opening does have a positive effect on economic growth. Furthermore, the results also imply that, it is through capital accumulation and deepening that capital-account opening influences economic growth.

Keywords: capital account liberalization, economy growth, threshold effect

1. Introduction

Since the 1980s, influenced by globalization and economic liberalism, the capital account liberalization swept around the world. Developed countries as well as developing countries positively opened capital account to achieve economic growth. However, followed by the outbreak of the financial crisis in Southeast Asia last centuary, whether the capital account liberalization is beneficial to the economic growth was open to dispute.

From the point of China's capital account opening, we can see that accompanying China's accession to WTO and RMB exchange rate reform, the capital account liberalization developed rapidly after the 21st century. In the aspect of direct investment, China encouraged foreign direct investment (FDI) and set no barriers to it; In the aspect of portfolio investment, Qualified Foreign Institutional investors (QFII) mechanism and Qualified Domestic Institutional investors (QDII) mechanism were established to provide domestic enterprise with policy support to participate directly in the international capital market. According to "Annual Report on Exchange Arrangements and Exchange" (IMF, 2014), at current China's capital account opening level, there are 16 basic capital account convertibility with 0 fully capital

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account convertibility, 23 partly capital account convertibility and 4 capital account inconvertibility, which mainly exist in transactions in money and capital market and transactions in derivative product and instruments. In general, although China has been continuously promoting capital account liberalization, there is still a significant difference between China's capital account liberization and that of other countries.

Recently, due to the new global economic situation and the monetary policy division of the world, together with decreasing growth trend caused by China's New Normal Economy, China's capital outflows has accelerated since 2016, causing foreign currency reserves to dwindle, which in turn made a caution to China's capital account opening.

Figure 1 shows that China's foreign exchange reserve falls from the peak at 3993.212 billion dollar in July 2014 to currently around 3001 billion dollar. Aiming at restraining capital outflows and foreign currency reserve reduction, China adopted concealed measures to restrict the liberalization of capital account. Judging from the current situation, China's policy of capital account liberalization meets a controversy: financial marketization opens the capital account while capital account control is also needed to maintain financial stability.

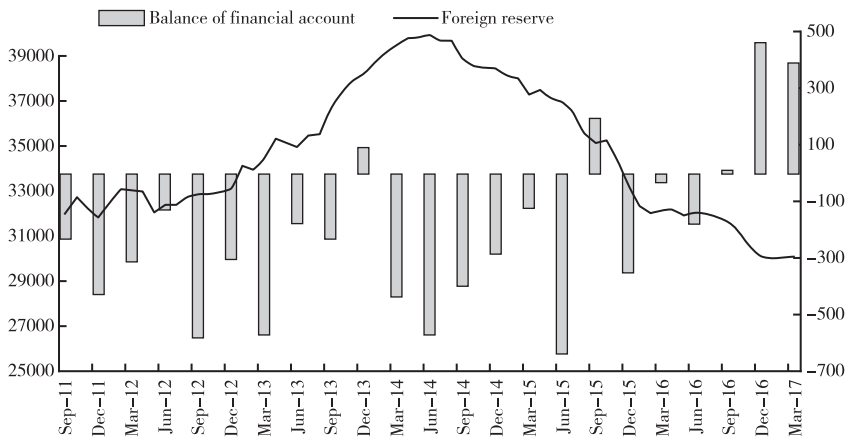

Figure 1. China's Financial Account and Foreign Exchange Reserve

Thus, in this paper we focus on the growth effect of capital account opening, and are going to deliver some implication about whether it will bring about economic growth or not. The paper measures the degree of capital account openness by using KAOPE index, making empirical research of panel data model of 144 countries to analyze the growth effect of capital-account opening quantitatively. Moreover, the paper studies the income threshold effect and channel mechanism of the capital account liberalization by comparing groups at different income levels, based on which we put forward recommendations suitable for our countries' policy.

2. Literature Review

According to traditional economic theory, capital account liberalization can promote a country's economic growth at least from the following four aspects: First, the opening of the capital account will help repair the market distortions, improve allocation efficiency so as to increase national welfare. Second, the opening of the capital account breaks the environment of financial repression, helping residents and enterprises increase the rate of return on investment. Third, the opening of the capital account allows foreign financial institutions to enter domestic financial market and helps foster it with depth and breadth. Fourth, capital account liberalization broadens the financing channels for domestic enterprises and help enterprises to break away from financing constraints and reduce financial costs. On the other hand, in view of the actual situation of capital account liberalization, many emerging countries did not achieve economic growth acceleration after opening capital account. On the contrary, they faced sharp fluctuations in short-term capital flows, some of which even experienced financial crisis. Hence, whether the capital account liberalization is beneficial to economic growth was open to questioning by academic studies.

At the level of literature, academic research on the economic growth effects of capital account liberalization also did not reach an agreement. In terms of the growth effect, the literature in this field can be divided into three categories: the theory of good influence, bad influence and uncertain effect.

The promotion theory demonstrates that capital account opening contributes to the economic growth of all countries with no differences. Quinn (1997) is one of the earliest scholars to hold the theory. He used an indicator to evaluate a country's capital account openness degree and per capita GDP to measure a country's economic growth. According to data from 58 countries in 29 years, he found that the opening of capital account did contribute to the growth of per capita GDP in these countries. To explore the economic impact of capital account opening, O' Donnell (2001) combines IMF qualitative analysis method with the quantitative method of financial liberalization, pointing out that capital account opening has a positive effect on economic growth. Klein and Olivei (2000) analyze the data of the eight years from 1986 to 1995, using the financial deepening index and open index of 82 developed and developing countries as the sample, and concluded that per capita GDP growth rate grows significantly under open conditions in the regression model.

On the contrary, the theory of bad influence suggested that the capital account opening would have a negative effect on a country's economic growth. To be specific, Yan (2008) finds that capital flows are likely to enter high-risk fields in immature financial markets in developing countries, causing capital mismatches and current account imbalances that impede economic growth. Alessandria and Qian (2002) argue that when a country is in a closed state of economy, the intermediary role of financial

institutions becomes important and moral hazard is well controlled. However, when a country liberalizes its capital account, other diversified forms of financing will weaken the intermediary role of the financial institutions, driving the inflow of funds into the unreasonable fields and projects and damaging a country's economic growth. Kim and Lee (2006) find that capital account liberalization inevitably causes huge capital flows, and the rapid changes of capital increase the probability and scale of the crisis and hinder economic growth.

In addition to the theory of good and bad influence, the literature of uncertain effects is also quite representative. In the literature of Grilli and Milesi-Ferretti (1995), GDP per capita growth rate, capital account openness index, income threshold, multiple exchange rate arrangements, index of the current account balance were adopted as variables in a regression of data from 61 countries from 1966 to 1989, which indicates that capital account liberalization was not significant in promoting economic growth. Rodrik (1998) reaches the same conclusion after analyzing data from 100 developed and developing countries selected as samples from 1975 to 1989.

According to economic theory, the uncertain effects of opening capital account results from different growth effect showing in the different types of countries with capital account liberalization. For instance, some documents suggest that the opening of capital accounts is only a boost to industrialized countries. In this field of study, Edwards (2001) finds that whether capital account liberalization is conducive to economic growth depends on different objects. Specifically speaking, capital account liberalization is beneficial to industrialized countries and relatively developed emerging countries, but it hinders the economic growth of low-income underdeveloped countries. Arteta, Wyplosz and Eichengreen (2001) hold the same view, pointing out that middle and high income countries earn much more revenue from capital account liberalization than they do in low-income countries. Besides, they think that the effect of capital account liberalization is also influenced by the stability of a country's macroeconomic situation.

In addition to analyzing the direction of capital account liberalization, some documents discussed the capital account liberalization mechanism for economic growth. In general, these documents suggested that capital account liberalization contribute to economic growth by promoting the improvement of income levels, government policy and the development of financial sectors.

3. Data and Methods

In this paper, we use a panel data model to analyze the economic growth effect of capital account opening. In this part, the paper firstly gives out model specification, then introduces the variable selection and data. Finally, in order to verify the stationary of variables, the panel unit root test is carried out for each variable.

3.1. Model Specification

In this paper, we set a panel data model containing 144 countries as follows:

$$Y_{it} = X_{it}\beta+\alpha_i+\varepsilon_{it} \quad (1)$$

where, $Y_{i,t}$ is the per capita GDP growth rate, used to measure economic growth. X represents explanatory variables (KAOPEN index) and nine control variables that may have influence on the degree of openness of the capital account. Besides, α is the intercept term, β is the regression coefficient column vector, ε is the error term.

3.2. Variables

The explained variable in the model is economic growth, where the per capita GDP growth rate is used as a measure. The explanatory variable in the text is the degree of capital account openness. Based on the existing research, this paper will use the KAOPEN index to measure the a country's capital account openness.

The control variables in this paper can be divided into three categories: financial market variables, trade investment variables and other control variables.

Firstly, financial market indicators contain real interest rates, M2 growth rates and stock trading volume growth, the real interest rate variables reflect the changes in the cost of capital, and it is chosen as a control variable to control the impact of interest rates on economic growth. M2 should be included in the control variables for it is an important indicator of money supply, reflecting the real and potential purchasing power and affecting economic growth. The stock trading volume measures the degree of direct financing and the degree of a country's financial market activity, which has a potential impact on economic growth.

Trade and investment-related variables contain the net inflow of foreign direct investment (FDI), current account balances, and capital formation. Specifically, foreign direct investment and current account balance reflect the contribution of foreign direct investment and international trade to economic growth. Capital formation, measured by capital accumulation, reflects economic growth effect brought by capital deepening.

Other control variables such as population growth rate, unemployment rate and college enrollment rate are the long-term potential influencing factors of economic growth.

Overall, the growth rate of per capita GDP is selected as the explained variable for its representativeness of economic growth; the KAOPEN index is selected as the explanatory variable to measure capital account openness; control variables embrace: the real interest rate, stock trading volume growth rate, M2 growth rate, the percentage

of net inflow of foreign direct investment in GDP, the percentage of capital formation in GDP accounted for GDP, the percentage of the current account balance in GDP, college enrollment rate, population growth rate and unemployment rate.

3.3. Data

All data in this paper comes from the world bank database. Table 1 demonstrates the variable notation and data sources in the model. Table 2 presents descriptive statistics of each variable.

Table 1. Variable Notation and Data Sources.

Variable	Meaning	Data source
Y	Per capita GDP growth rate	World Bank, The World Development Indicators
X	KAOPEN	Chin-Ito Financial Openness Index
rate	Real intreat rate	World Bank, The World Development Indicators
stock	Growth rate of stock trading volume	World Bank, The World Development Indicators
M2	M2 growth rate	World Bank, The World Development Indicators
FDI	Net inflow of foreign direct investment as a percentage of GDP	World Bank, The World Development Indicators
capital	Capital formation as a percentage of GDP	World Bank, The World Development Indicators
ca	Current account balance as a percentage of GDP	World Bank, The World Development Indicators
educate	College enrollment rate	World Bank, The World Development Indicators
population	Population grow rate	World Bank, The World Development Indicators
unemployment	Unemployment rate	World Bank, The World Development Indicators

Table 2. Descriptive Statistics Analysis of All Samples

variable	Mean	Median	Maximum	Minimum	Standard deviation
Y	2.621017	2.38035	11.90427	−7.84864	3.029624
X	1.21671	1.869955	2.389193	−1.894798	1.356255
rate	4.960685	4.064874	46.44668	−18.3271	6.462119
stock	52.77274	18.01874	660.2636	0.003065	84.54186
M2	81.58627	63.75251	350.51	17.14369	54.84346
FDI	4.593367	3.040327	50.78472	−16.0911	6.464368
ca	−1.019989	–1.83862	16.18676	–27.352	6.215951
educate	53.87605	56.26816	99.66034	0.67534	20.42642
population	0.682856	0.640602	4.25931	−1.91102	0.890659
unemployment	29.2387	27.60000	88.7000	0.30000	19.65479
capital	23.94552	23.32548	58.15072	12.33331	5.899461

3.4. Unit Root Test

In order to test the stability of the variables in the model and prevent spurious regression, the stability of the variables needs to be tested. There are different methods for unit root test and three of which were conservatively given with results in this paper: LLC, ADF and PP test.

Table 3. Unit Root Test of 144 Countries

Variables	LLC test		ADF test		PP test	
educate	−58.9294***	stable	218.889*	stable	266.869*	stable
stock	−32.3844***	stable	747.802***	stable	971.078***	stable
ca	−8.95872***	stable	456.059***	stable	418.815***	stable
FDI	−15.1484***	stable	759.457***	stable	781.328***	stable
M2	−35.1679***	stable	1557.24***	stable	1629.23***	stable
rate	−19.0218***	stable	807.806***	stable	1132.73***	stable
unemployment	−75.6898***	stable	219.59***	stable	190.86***	stable
capital	−6.00201***	stable	370.848***	stable	364.246***	stable
X	−24.4797***	stable	670.736***	stable	950.396***	stable
Y	−24.1271***	stable	994.685***	stable	1245.56***	stable
population	−17.2342***	stable	836.13***	stable	814.919***	stable

Notes: *** indicates the significant level at 1% probability; ** indicates the significant level at 5% probability; * indicates the significant level at 10% probability. The same as in the following tables.

Table 3 shows that, according to the results of three unit root tests, all 144 variables selected in the paper have passed the stability test. For the sake of soundness, the panel unit root test according to different groups of samples in 144 countries also gives stationary results, which is not listed due to limited space.

4. Empirical Analysis

In this part, we firstly analyze the whole samples of 144 countries empirically; secondly, groups of samples of different income were analyzed to determine the threshold effect of capital account liberalization, respectively at the divide of $3000, $4500 and $6000 income level; finally, the paper analyzed the mechanism of capital account liberalization to find out through what channels capital account liberalization produces growth effect.

4.1. Empirical Analysis on the Whole Sample

The data of 144 countries in 1996-2014 are selected as the research sample, and four different types of model settings are considered on the basis of the regression Equation (1).

Specifically speaking, model 1 is a fixed effect model with all control variable,

while model 2 is a similar one with random effect. Model 3 is a fixed effect model which excludes trade investment variable, including only financial market variable and other variables; while in the fixed effect model 4, the financial market variable is excluded. The regression results of four models are given in Table 4.

Table 4. Panel Regression of 144 Countries

Variable	Model 1	Model 2	Model 3	Model 4
C	7.172161*** (0.0000)	10.68944*** (0.0000)	6.304054*** (0.0000)	3.281229*** (0.0000)
X	−0.081417*** (0.0003)	−0.205072** (0.0015)	−0.069767*** (0.0006)	−0.119855*** (0.0000)
rate	−0.160403** (0.0186)	−0.015898** (0.00237)	−0.101782** (0.0168)	
stock	−0.005416 (0.2137)	0.094731 (0.3135)	−0.005878 (0.1598)	
M2	0.034667*** (0.0008)	0.001873*** (0.0037)	0.018417*** (0.0094)	
FDI	−0.02296 (0.4722)	0.011823 (0.2167)		−0.012116*** (0.0039)
capital	0.147600*** (0.0071)	0.053916*** (0.0027)		0.102718*** (0.0008)
ca	0.061609*** (0.0006)	0.056513** (0.0237)		0.080684*** (0.0001)
educate	0.029953 (0.4671)	−0.029649 (0.2137)	0.047585*** (0.0028)	−0.082427* (0.2172)
population	−0.199158*** (0.0090)	0.964867*** (0.0007)	−1.280555*** (0.0008)	−0.459848*** (0.0004)
unemployment	−0.066459*** (0.0008)	0.022719*** (0.0057)	0.066160*** (0.0048)	0.116404*** (0.0052)
R-squared	0.846093	0.644405	0.746291	0.775093
Hausman Test		47.300718 (0.0000)		

As is shown in Table 4, the Hausman test of the full sample model shows that a fixed effect model should be established. From the model 1–4, the capital account liberalization variable coefficient *X* in the four model is negative, which means capital account liberalization not only does not contribute to economic growth, but also inhibits economic growth from the view of 144 countries in the whole sample. The reason, as literature analysis mentioned, is that the effect of opening capital account is conditional for promoting economic growth. If we take income level as a threshold, most countries in the whole sample do not reach the threshold effect of income, making a negative correlation appear in the overall result.

From the situation of other control variables, money supply *M2*, capital formation variable (*capital*) and the current account ratio (*ca*) promote a country's economic growth significantly; the real interest rate (*rate*) has significant inhibitory effect on

economic growth; while the demographic and employment variables (*population* and *unemployment*) play a significant role in the economic growth of a country, but the influential direction is relatively vague. Other variables (*stock market*, *FDI* and *education level*) have no significant influence on economic growth, or they only have significant influence according to specific model settings.

4.2. The Threshold Effect of Capital Account Liberalization

As noted above, the economic growth promoted by capital account liberalization depends on some basic economic conditions, which cause negative effect of capital account opening on economic growth in the whole sample regression analysis. This is why many developing countries open their capital accounts, they fail to achieve the expected economic growth for not meeting the threshold condition. Thus, the conclusion reached was capital account liberalization inhibits economic growth in the overall model.

In this part, we choose the per capita GDP as a measured threshold, and take the sample of $3000, $4500 and $6000 as the threshold income to analyze the effect of the capital account liberalization on economic growth in different groups.

First, the per capita income of $3000 is taken as the threshold. According to the world bank's per capita GDP data, in 1996, 53 countries' per capita income is over $3000, and that in 91 countries is below $3000. In the following, two kinds of model settings are considered according to each group: model 5 and 6 are the fixed effect model and random effect model of per capita income less than $3000; accordingly, the model 7 and 8 are corresponding model of per capita income over $3000. The regression results are given in Table 5.

Table 5 shows that, we should reject the null hypothesis with the result of per capita income over $3000 in Hausman test and establish fixed effect model. On the contrary, in the tests whose per capita income is below $3000, the P value of the Hausman test is 0.7187, indicating that we should accept the null hypothesis and establish a random effect model. Therefore, model 7 applies to samples beyond $3000, while model 6 applies to that under $3000.

In the tests whose per capita income is below $3000, the X coefficient of capital account liberalization is negative, which means that capital account liberalization is negatively related to economic growth in countries with lower per capita income. Besides, real interest rate, M2, current account balance, net inflow of foreign direct investment, college enrollment rate and population growth rate have significant effects on the economic growth of this group of samples, while the stock market, capital formation and unemployment rate do not have a prominent impact on the economic growth of the sample.

In the case of a per capita income greater than $3000, model 7 shows that the coefficient of the capital account openness X is negative, indicating that even for countries with higher income levels, capital account liberalization is also negatively

related to the economic growth of these countries. In addition, in the model 6, M2, capital formation, current account balance, net foreign direct investment inflows and unemployment rate are variables having limited impact on economic growth; while interest rates, capital markets, education and demographic variables are those with insignificantly influence.

Table 5. Panel Regression with Threshold Income of $3000

Variable	Per capita income below $3000		Per capita income beyond $3000	
	Model 5	Model 6	Model 7	Model 8
C	5.952381* (0.0678)	11.30153* (0.0569)	10.79408*** (0.0003)	3.816182*** (0.0043)
X	–1.537827* (0.0393)	–1.778241** (0.0123)	–0.021162** (0.0206)	–0.044409** (0.0305)
rate	–0.064383*** (0.0079)	–0.070655*** (0.0018)	–0.054366 (0.3148)	0.027555 (0.2917)
stock	0.049496 (0.6864)	0.140927 (0.2923)	–0.074684 (0.6018)	–0.129299 (0.3171)
M2	0.079357*** (0.0026)	0.074176*** (0.0074)	0.011734*** (0.0025)	0.022288*** (0.0000)
FDI	0.211934** (0.0257)	0.344192** (0.0166)	0.050635*** (0.0095)	–0.021167** (0.0140)
capital	0.039752 (0.6433)	–0.269203 (0.1502)	0.241986** (0.0128)	0.051170* (0.0675)
ca	0.195605* (0.0627)	0.139256* (0.0289)	0.104144*** (0.0040)	0.048773*** (0.0051)
educate	–0.063794* (0.0647)	0.005508** (0.0425)	–0.105599 (0.1201)	–0.008031 (0.4141)
population	–1.711124* (0.0513)	1.614896** (0.0144)	–0.842725 (0.1492)	–0.821248 (0.0104)
unemployment	–0.004890 (0.8530)	–0.047535 (0.3938)	–0.061101** (0.0137)	0.014016** (0.0157)
R-squared	0.479658	0.667956	0.698624	0.526068
Hausman		7.939133 (0.7187)		62.995330 (0.0000)

Contrasting the results of countries with incomes above $3000 and below, we find that the coefficients of *X* are both significant and negative. The reason why the impact of capital account opening on economic growth is negative is that the threshold of $3000 we choose in the regression does not constitute an actual threshold for the growth effect of capital account. In other words, the threshold is too low for low-income countries to be properly grouped.

Second, the per capita income of $4500 is taken as the threshold. Sorted out in the world bank's per capita GDP data, in 1996, 41 countries' per capita income is over $4500, and 103 coutries' income level is below $4500. Similarly, model 9 and 10 are the fixed effect model and random effect models of per capita income less than $4500;

and the model 11 and 12 are corresponding models of per capita income over $4500. The regression results of four models are given in Table 6.

Table 6. Panel Regression with Threshold Income of $4500

Variable	Per capita income below $4500		Per capita income beyond $4500	
	Model 9	Model 10	Model 11	Model 12
C	12.80625*** (0.0080)	5.868119*** (0.0004)	2.491607*** (0.0007)	4.508319** (0.0282)
X	–1.247946*** (0.0008)	–1.205362** (0.0502)	0.447643*** (0.0004)	0.396216*** (0.0068)
rate	–0.110655*** (0.0059)	–0.097824*** (0.0079)	0.005503 (0.7953)	0.029465 (0.2734)
stock	0.086927 (0.2923)	–0.008263 (0.9420)	0.223780** (0.0251)	–0.087099* (0.0606)
M2	0.004176 (0.2748)	0.001059 (0.2570)	0.001645*** (0.0021)	–0.002596*** (0.0031)
FDI	–0.344192** (0.0166)	0.277271*** (0.0003)	0.339290*** (0.0062)	0.312244** (0.0104)
capital	–0.269203 (0.0039)	0.008999 (0.0068)	0.224218*** (0.0090)	0.028621*** (0.0065)
ca	0.122256*** (0.0089)	0.163377*** (0.0095)	–0.027865 (0.2275)	0.034660 (0.2905)
educate	–0.045508 (0.4441)	0.043125 (0.2689)	0.096843* (0.0101)	–0.009295* (0.0582)
population	–1.614896*** (0.0044)	–1.622508** (0.0102)	0.703878*** (0.0004)	0.687607** (0.0353)
unemployment	–0.047535** (0.0138)	0.02132* (0.0664)	–0.052292*** (0.0065)	–0.006109* (0.0913)
R-squared	0.600850	0.540463	0.725037	0.625057
Hausman		14.660541 (0.1986)		52.680942 (0.0000)

As is shown in Table 6, the null hypothesis with the result of per capita income over $4500 is rejected in Hausman test and a fixed effect model should be established. While in the tests whose per capita income is below $4500, the P value in the Hausman test is 0.7187, indicating that we should accept the null hypothesis and establish a random effect model. Therefore, we respectively think of the model 10 and model 11.

Specifically, in the tests whose per capita income is below $4500, the *X* coefficient of capital account liberalization is negative in the model 10, which means that capital account liberalization is negatively related to economic growth in countries with per capita income lower than $4500. Besides, the result of model shows that real interest rate, net inflow of foreign direct investment, current account balance, unemployment rate and population growth rate have significant effects on the economic growth. However, capital market, M2, capital formation and education development level do not have a prominent impact on the economic growth.

In contrast, in the case of the per capita income of more than $4500, model 11 shows that the coefficient of capital account openness *X* is significantly positive, which means that for countries with per capita income level over $4500, capital account opening promotes the economic growth. In addition, the growth rate of stock trading volume, M2, FDI, capital formation, education, population growth and unemployment variables significantly effect the economic growth; meanwhile, current account surplus and interest rate variables do not have a prominent impact.

Compared with the result demarcate per capita income at $4500, capital account liberalization has a significant negative impact on the economic growth for countries whose per capita income less than $4500. And for those with per capita income more than $4500, capital account liberalization positively effects the economy growth. It means that $4500 can be considered as a threshold. In addition, for groups more than $4500, the capital market variables shows a significant positive effect for the first time compared with the regression results before. It is similar to the impact of capital account opening, the promoting effect of capital market growth exists in the relatively developed countries, though it is not obvious in low income countries.

Third, the per capita income of $6000 is taken as the threshold. We make further verification based on the result of groups with per capita income level at $6000. Reference the world bank's per capita disposal data, in 1996, 32 countries' per capita income was over $6000, and 112 of which was below $6000. Similarly, model 13 and 14 are the fixed effect model and random effect model of per capita income less than $6000; and the model 15 and 16 are corresponding model of per capita income over $4500. The regression results of four models are given in Table 7.

As is shown in Table 7, whether the per capita income is above or below $6,000, the null hypothesis should be rejected in Hausman test and a fixed effect model should be established. Thus, model 13 and model 15 are respectively considered here.

When the per capita income is less than $6000, the coefficient of capital account openness *X* shown in model 13 is positive but insignificant, indicating that in the countries whose per capita income less than $6000, the impact of capital account liberalization is not clear. In addition, the real interest rate, capital market, FDI, current account surplus, and population variables have a significant impact on the economic growth of the group's samples; and the effects of money supply, capital formation, education and unemployment variables on economic growth is not statistically significant.

When the per capita income is above $6000, the coefficient of capital account openness *X* shows in model 15 is positive, indicating that capital account liberalization promotes the countries' economic growth for whose per capita income is over $6000. In addition, M2, capital formation, the current account balance, college enrollment rate, population growth rate and the unemployment rate also constitute a significant impact on the group's economic growth; but the real interest rate, capital market, FDI does not constitute a significant impact.

Table 7. Panel Regression Model with Per Capita Income of $6000

Variable	Per capita income below $6000		Per capita income beyond $6000	
	Model 13	Model 14	Model 15	Model 16
C	15.06344* (0.0569)	6.606816* (0.0678)	18.53735*** (0.0003)	3.816182*** (0.0043)
X	1.521999 (0.2523)	–1.521999 (0.1393)	2.669702*** (0.0002)	2.057746*** (0.0006)
rate	–0.150655** (0.0410)	–1.164383 (0.3231)	–0.034366 (0.3148)	0.137555 (0.1117)
stock	0.030927** (0.0174)	0.049496** (0.0186)	–0.174684 (0.6018)	–0.289299 (0.0871)
M2	0.001876 (0.2923)	0.009357 (0.6864)	–0.021734*** (0.0025)	0.032288** (0.0400)
FDI	0.344192** (0.0166)	0.203934** (0.0257)	0.050635 (0.1095)	0.021167 (0.3840)
capital	0.150059 (0.2302)	0.039752 (0.1433)	0.445757*** (0.0028)	0.224538*** (0.0075)
ca	0.139256** (0.0289)	0.195605** (0.0227)	0.124144* (0.0540)	0.048773** (0.0251)
educate	–0.135508 (0.9425)	–0.133794 (0.1647)	–0.105599* (0.0366)	–0.018031** (0.0441)
population	–1.614896* (0.0944)	–1.171124** (0.0013)	1.122725*** (0.0092)	0.821248** (0.0104)
unemployment	–0.047535 (0.3938)	–0.004890 (0.8530)	–0.041101** (0.0437)	–0.017718* (0.0757)
R-squared	0.508981	0.507981	0.741046	0.509383
Hausman		20.280354 (0.0416)		57.154572 (0.0000)

Comparing the results in countries whose per capita income above and below $6000, we find that the coefficient of *X* is significantly positive when per capita income is above $6000, while it is positive, but not significant when the per capita income is below $6000. The reason is that the threshold of $6000 we choose in the model is too high for it excludes many samples that may have positive growth effects of capital account opening. As a result, $6000 does not constitute an obvious threshold effect.

4.3. The Mechanism of Action of Capital Account Liberalization

In order to further clarify the influence mechanism of capital account liberalization on economic growth, we add cross terms of capital account liberalization and other variables in the model, so as to judge by which means capital account opening promotes a country's economic growth.

Specifically speaking, taking the influence of capital account liberalization on a country's capital formation into account, we take the cross term of capital formation variables (*capital*) and capital account liberalization, considering full of 144 samples and block samples with the threshold of $4500. Table 8 shows the regression results

with fixed and random effects of three groups of samples respectively (model 17, 19 and 21 for fixed effects, the others for random effects).

Table 8. Panel Regression with the Mechanism of Capital Account Opening

Variable	144 countries		Per capita income less than $4500		Per capita income more than $4500	
	Model 17	Model 18	Model 19	Model 20	Model 21	Model 22
C	7.172161*** (0.0000)	5.315969*** (0.0005)	15.85025*** (0.0080)	6.838119*** (0.0004)	2.392607*** (0.0007)	5.508319** (0.0282)
X	–1.772018*** (0.0003)	–1.231294** (0.0214)	–1.246846*** (0.0008)	–1.207682** (0.0502)	0.447533*** (0.0004)	0.395716*** (0.0068)
rate	–0.164003* (0.0580)	–0.022232* (0.0507)	–0.107655*** (0.0059)	–0.093524*** (0.0079)	0.015503 (0.7953)	0.026465 (0.2734)
stock	–0.005416 (0.2137)	–0.092629 (0.2856)	0.086647 (0.2923)	–0.008543 (0.9420)	0.223080** (0.0251)	–0.084099* (0.0606)
M2	0.034667*** (0.0008)	0.001787* (0.0722)	0.005376 (0.2748)	0.003459 (0.2570)	0.011645*** (0.0021)	–0.005096*** (0.0031)
FDI	0.02296** (0.0522)	0.005044** (0.0443)	–0.346592** (0.0166)	0.270871*** (0.0003)	0.338790*** (0.0062)	0.398244** (0.0104)
capital	0.205585** (0.0129)	0.000510** (0.0205)	–0.268703*** (0.0039)	0.008699*** (0.0068)	0.228718*** (0.0090)	0.028821*** (0.0065)
ca	0.061609*** (0.0006)	0.056219** (0.0164)	0.127756*** (0.0089)	0.163077*** (0.0095)	–0.027732 (0.2275)	0.034679 (0.2905)
educate	0.029953* (0.0671)	–0.036419 (0.1021)	–0.045808 (0.4441)	0.049825 (0.2689)	0.096543* (0.0101)	–0.009195* (0.0582)
population	–0.199158*** (0.0090)	–1.058424*** (0.0000)	–1.613296*** (0.0044)	–1.622408** (0.0102)	0.703778*** (0.0004)	0.686607** (0.0353)
unemployment	–0.066459*** (0.0008)	–0.017929** (0.0650)	–0.048335** (0.0138)	0.02252* (0.0664)	–0.051292*** (0.0065)	–0.007209* (0.0913)
X×capital	–0.076448** (0.0207)	–0.044577** (0.0143)	–0.048798* (0.0812)	–0.024766** (0.0458)	0.084125* (0.0561)	0.003955* (0.0864)
R-squared	0.853571	0.829373	0.602850	0.544063	0.720037	0.615054
Hausman Test		48.373304 (0.0000)		23.660541 (0.0289)		51.680942 (0.0000)

Table 8 shows that for these three sets of samples, the Hausman test results should reject the null hypothesis and establish a fixed effect model. Thus, models 17, 19 and 21 are considered here, respectively.

For the full sample model, model 17 shows that capital account opening X has a significant negative effect on economic growth.In addition, unlike the full sample model, all control variables (real interest rate, money supply M2, FDI, capital formation, capital account surplus, education, population and unemployment variables) have a significant impact on economic growth, which means that the weak significance of some variables in the previous whole sample model may be due to the neglect of the capital account opening mechanism channel. In terms of the cross term of capital formation variables and capital account opening, it has a significant negative impact on the economic growth of the full sample countries as well, which means that for all

sample countries, capital account opening enlarges its negative impact through capital formation channels on a country's economic growth.

For where the per capita income is less than $4500, the conclusion of model 19 is consistent with model 10 that capital account opening *X* has a significant negative effect on economic growth; and real interest rate, FDI, capital formation, current account surplus, population and the unemployment variable have a significant positive impact on the sample's economic growth. For the cross term of capital-forming variable and capital account opening, similar to the conclusion of the full-sample model, the sub-sample also shows a significant negative impact on the economic growth, which means that for countries with per capita income less than $4500, the opening of capital account will cause a negative impact on the economic growth of a country, and this negative effects would be enlarged by capital formation channel.

For where the per capita income is larger than $4500, the conclusion of model 21 is consistent with model 11, that is, capital account opening *X* has shown a significant effect on economic growth; and in terms of control variables, most of which have a significant impact on economic growth except real interest rate and current account surplus. For the cross term of capital forming and capital account opening, the sub-sample regression shows a significant positive effect to the economic growth, which means that for countries with per capita incomes greater than $4500, the opening of capital account will lead to the expansion of capital formation channels, which promotes the role of a country's economic growth.

In general, the conclusion is consistent with the previous result, that is, the opening of the capital account has an inhibitory effect on the economic growth of the whole sample country, after incorporating the cross term of capital account and capital formation. But only for countries with per capita income in more than $4500, the opening of capital accounts has a clear role in promoting economic growth. Thus, per capita income of $4500 still constitutes a capital account opening threshold. In addition, from the case of variable significance, the result of adding cross item also maintains a high degree of consistency with the previous model. Finally, from the significance and sign of the cross term, there is also a threshold effect, that is, only in sample countries with a per capita income of more than $4500, the cross item presents a positive significance, whereas in the sample countries below $4500, the crossing term has a negative significant effect. This result means that only for relatively high-income countries, capital account opening will play a catalytic role in capital accumulation of a country's economic growth; otherwise the capital account opening will only negatively affect the country's economic growth.

5. Conclusions

This paper analyzes the economic growth effect of capital account opening. The conclusions of this paper show that capital account opening has obvious threshold

effect on economic growth. Only when per capita income is more than $4500, capital account opening is conducive to economic growth. When per capita income is less than $4500, the opening of the capital account will hinder the growth of a country's economy. In addition, the empirical study of this paper also shows that capital formation is an important channel for capital account opening to promote economic growth in a country.

As to China, its per capita income has long exceeded $4500, meeting the growth condition of capital account liberalization. On the other hand, from the perspective of the capital account opening, whether compared with developed countries or developing countries, there is giant open space in China at this stage. Although capital inflows under the current domestic economic conditions do not constitute a decisive force in domestic economic growth. It should be noted that, due to the current decline in the domestic capital formation efficiency, capital account opening will help improve capital formation efficiency and economic growth.

In addition, opening capital account is also conducive to China's economic restructuring. At present, high saving, high investment and excess production capacity are prominent contradictions for China's economic development. Because of the rising labor costs in China, the competitiveness of labor-intensive industries have lost their comparative advantages, therefore, opening capital account will help to optimize the allocation of domestic capital on a global scale, to achieve industrial upgrading and structural adjustment to enhance the overall competitiveness of China's economy.

Finally, from the pratical perspective, since the efficiency of taking the international capital control is declining, capital account opening will become an unavoidable choice. In fact, more and more items of international payments have both the characteristics of the current account and the capital account, making it difficult to distinguish strictly, which makes the capital account funds often mixed into the current account to evade control. Therefore, strict capital control can also damage long-term investments in the form of FDI and ODI, thus hindering the overall efficiency of the economy.

For the above reasons, the opening of China's capital account in the future should be conducted in an open, progressive, orderly, prudent and controllable manner. As for specific steps, we should mitigate the direct investment control with real trading background in the short run and encourage enterprises to go out. At the same time, moderate relaxation of commercial credit control is conductive to promote domestic banking competition and improve the financing situation of enterprises, especially small and medium-sized enterprises. In the long term, the government should strengthen the construction of financial markets, and put the open capital inflows superior to the opening of capital outflow. Besides, the government should adopt more market-oriented means to manage capital flows, gradually weaken the status of quantitative tools, highlight the role of price-based control; and should speed up the construction of macro-prudential supervision system, reducing the consussion of capital flow on the domestic macro economy.

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