Erasmus University Rotterdam

Erasmus School of Economics

Master thesis International economics

The effect of financial openness on crisis spillover effects

Randy Rensen

538836rr

Supervisor: Felix Ward

Second assessor: Agnieszka Markiewicz

Date final version: 14-6-2023

Abstract

This thesis investigates the effect that financial openness can have on spillover effects from foreign crises. A second assumption is made that spillover effects have decreased after the 2008 crisis due to capital controls. The Chinn and Ito index is used to measure financial openness. A difference-in-difference estimation is used to test for this relationship. The results show that countries that have a high degree of financial openness are more exposed to spillover effects from foreign crises than countries with a low degree of financial openness. The capital controls that have been imposed after 2008 show a small decrease in this effect.

Table of content

1. Introduction

In the last decades, the world has become smaller and smaller. Different countries and regions have become ever more integrated with each other. Trade and capital openness have surged throughout the 20th century due to new technological developments and the extensive scientific literature on the gains of trade and a country's degree of openness. Together with the increase of trade openness of most countries, the world has also seen a large rise in financial openness of most countries. Due to the rapid expansion of technology for capital mobility in the 20th and 21st centuries we have progressed into an age where banks and other forms of financial institutions are becoming more and more integrated. The lines between capital markets in different countries and regions become thinner and thinner which has proven to make matters such as accumulating capital and interbank lending much less costly in terms of time and transaction costs. When it comes to openness measures, the effects of financial openness are not as often researched as the effect that trade openness might have on different macroeconomic variables and processes. The effects of trade openness have been researched since the classical economic period by prominent economists such as Ricardo and Smith. The past few decades have however shown an increase in literature on capital openness and the effects that this has on the economy.

One of the main questions in the developing literature about the degree of financial openness of a country has been: What is financial openness? Different specifications of financial openness have existed throughout the literature. The most influential and widely used measurement of financial openness has been the one that was developed in the paper by Chinn and Ito (2008). In their paper, Chinn and Ito focus on the different facets of financial openness such as capital mobility possibilities and foreign exchange markets. By combing these different subjects of financial openness they are able to create a financial openness measure which has widely been used in modern literature about financial openness and the effects that it has. In this paper, the Chinn Ito index will be used as the main measure of financial openness. Further discussion on the financial openness measure by Chinn and Ito will be provided in later chapters.

Different facets of the economy have been linked to financial openness. One of the earlier and very influential papers to look into the term financial openness and why countries choose to be "financially open" is the paper by Quinn et all (1997). The authors

state that political relations and factor endowments can explain large parts of financial openness. It does however not become clear in their paper what the effects on the real economy are of being a relatively financially open country versus being a relatively financially closed country. In more recent literature the degree of financial openness of a country has been connected to different macro-economic variables such as wages (Bekeart et all, (2011)) and productivity (Jayadev et all (2007)). An important consequence of being relatively financially open has however not yet been researched. When looking at the degree of financial openness of a country one of the most important subjects is always the amount of cross-border financial transactions via financial institutions, mainly big banks. As stated before the global banking system has seen an enormous increase in the degree of integration that banks have with each other in the past decades. This development has brought easier transactions and a better connection between supply and demand in the sector but this development also has a cost. The danger that the substantial increase in interbank lending has brought was exposed during the 2008 financial crisis. The fall of the Lehman Brothers bank had a disastrous domino effect on the entire financial sector. Banks were unable to reclaim their interbank loans which caused many banks to go bankrupt. The increasing financial openness of countries and the enormous amount of interbank lending and other forms of international financial integration that this had brought caused one of the biggest financial crises of the past century. One of the main reasons for this were the catastrophic spillover effects that the bankruptcy, starting with banks in the United States had on other banks in the world. These events clearly showed one of the risks that financial openness brings to the economy of a country.

After the financial crisis of 2008 and the following euro crisis, the financial markets have tried to prevent a next such spillover episode of a financial crisis. Measures have been taken on both the international level by the IMF and on a more local level such as within the European Union. The dangers of uncontrolled financial markets and an unrestricted increase of financial openness are now known and preventive measures have been taken, the question of whether these measures have had the desired effect has not been answered yet in the literature.

The lack of literature on spillover effects in the financial markets and the relation that the extent of such spillover effects might have with the degree of financial openness of a country has led to the main hypothesis of this paper which is:

"When a country has a higher degree of financial openness, it will be more vulnerable to spillover effects of foreign financial crises."

As stated before the global financial capital markets have radically changed after the 2008 financial crisis and the following debt crises. Measures have been taken in order to try and prevent large future spillover effects of a crisis. Whether these measures have had an effect on the amount of spillover effects of global financial crises has not yet been researched which leads to the second hypothesis of this paper which is:

"International capital controls that have been imposed after the 2008 crisis have made the risk of financial crises spillovers as a result of financial openness less significant."

2. Theoretical framework

2.1 financial openness

The main argument in this thesis is based on the relationship between spillover effects of a global financial crisis and the degree of financial openness that a country has. As the hypothesis states, a positive relationship between the number of crisis spillover effects and the degree of financial openness of a country is expected. An obvious question that arises from this statement is: What is financial openness? The introduction of this thesis shortly addressed the topic of financial openness. The introduction also contained some early ideas about the effect that financial openness might have on different sets of macroeconomic variables. This chapter of the thesis will focus more on what financial openness is and how it will be measured in the following analyses.

Many papers have tried to come up with measures for financial openness. There is however a broad difference when it comes to these measurement strategies. The main focus is regularly the amount of capital-related deals and restrictions a country has to either protect or boost their local financial markets. Another class of financial openness measures is more focused on the actual macro-economic data instead of only looking at capital-related deals and restrictions. To present an overview of the many different measures of financial openness a paper has been made that reviews the different movements when it comes to measures for the degree of financial openness of a country. In the paper by Quinn et al (2011) an overview of the different measurements of financial openness is given. The authors start by placing all the different measurements for the degree of financial openness of a country into three categories.

1. De jure measures
2. De facto measures
3. Hybrid measures

The difference between these types of measures is that most de jure indicators focus on the annual report of exchange arrangements and exchange restrictions (AREAER). This is a report that is presented each year by the IMF and contains all the regulations that countries have when it comes to financial openness. This report has been published since 1967 which provides a long period of measurement opportunities. De facto measures of financial

openness are more focused on the actual capital flows that are the result of regulations. The focus is more on measured effects than expected effects from exchange arrangements or exchange restrictions. An example of such a measurement is from the paper by Lane and Milesi-Ferretti (2003) who connect financial openness to foreign assets and liabilities of a country as a percentage of GDP. Hybrid measures use a combination of both de facto and de jure measures.

The choice of this paper will be for a de jure measure that was first introduced in the paper: A new measure of financial openness by Chinn and Ito (2008). This measurement for the degree of financial openness of a country is reviewed as a well-grounded measure in the paper by Quinn et al (2011) and is widely cited in later papers that work with the degree of financial openness of a country. The reason that the measure for the degree of financial openness of a country by Chinn and Ito will be used in this paper is the positive reviews that it has received from many papers and scientific magazines and the fact that this index exists for many countries and a long time period which will enhance the external validity of the statistical analyses of this paper. The exact composition and further explanation of the index will follow below.

2.2 Chinn and Ito index

This part of the theoretical framework will further analyse and explain the Chinn Ito index for the degree of financial openness of a country. The Chinn and Ito index is as stated above first introduced in the paper: a measure of financial openness. With 2828 citations on google scholar per 25/4/2023 it is one of the most used measurements for financial openness. The Chinn and Ito index has been calculated for a set of 181 countries. The period that has data on the Chinn Ito index runs from 1970 until the most recent adjustment which is 2016 at the time of the data collection process.

The most important contribution that the Chinn and Ito index has made to the extensive literature that exists about financial openness is the inclusion of proper measurements for cross-border financial transactions. The authors have three main critique points on the existing literature about cross-border financial transactions and the capital account controls that are involved in this. First of all the measurement types for capital

controls that existed before do not properly measure the intensity of capital controls but only include certain binary variables that are not precise enough. Second, the data that is provided by the IMF in the AREAER is not precise enough and does not correctly make a difference between all the different facets of capital controls. Important differences in capital controls such as controls in inflows or outflows are not specified on their own in the AREAER report by the IMF. This could give an incomplete picture of the exact impact of capital controls on a country. The last critique point of the authors on current capital account controls is about the jure and de facto controls. The authors state that the difference between these two is hard to see in real life due to attempts by the private sector to avoid these regulations as explained in the paper by Edwards (1999). These points form the main basis of the critique that Chinn and Ito have on the existing literature about the degree of financial openness of a country. The authors address that numerous attempts to combat the lack of a proper measurement for capital control intensity based on Time series and extrapolation have all failed due to a bad methodology or a lack of long enough time-series. (Johnston and Tamirisa (1998) and Miniane (2004)).

Based on the above-mentioned critique on the current literature, Chinn and Ito have decided to create their own measurement of financial openness. The name of this index is KAOPEN. KAOPEN is based on a set of dummy variables. The authors of the paper select four main categories of financial openness. The four categories are:

1. A dummy that is based on the use of multiple exchange rates in a country.
2. A dummy that is based on the existence of laws and regulations that can hinder transactions on the current account.
3. A dummy that is based on the existence of laws and regulations that can hinder transactions on the capital account.
4. A dummy that is based on whether a country forces companies to surrender their export proceeds

From these dummies, the KAOPEN index is created. The higher the degree of financial openness of a country the higher the number of the index will be. The KAPOEN index takes on values between -1.92 and 2.31. The goal of the KAOPEN index is as described before to capture the intensity of the restrictions on free capital flows. Something in which previous papers have not succeeded. The extensive discussion of the paper is necessary to understand the word

financial openness in the context of this thesis. This index will later be used in the statistical analysis of this paper in order to test for a relation between the degree of financial openness of a country and the danger that crisis spillover effects have on a country. When we look at the development of financial openness according to the Chinn and Ito index we see a clear trend that gives this thesis great policy relevance. In table 1 the growth rate of the Chinn and Ito index is given over the period 1970 until 2016. A clear significant positive growth pattern can be seen. When financial openness would as stated in the hypothesis indeed lead to crisis spillover effects then the growing trend in financial openness makes it even more important to look into this relationship.

Financial openness	Coefficient (Standard error)
Year	0.033*** (0.0015)
Constant	-66.48*** (3.12)

Table 1: The growth rate of the degree of financial openness in the panel dataset on 83 countries. The full set of countries can be found in appendix A. The shown growth rate is the average growth rate of the degree of financial openness over the period 1970 until 2016. The number of * indicates the significance level where * means significant at the 10% level, ** means significant at the 5% level and *** means significant at the 1% level.

2.3 The relation between financial openness and crisis spillover effects

The goal of this thesis is to test for a relation between the degree of financial openness of a country and the possible spillover effects of a crisis, but why would we expect such an effect? As can be seen in the discussion of Chinn and Ito (2008) the main part of financial openness as measured by their index is about the degree to which capital can freely flow between countries. The theory that is behind the expected relation between financial

openness and spillover effects is for a large part based on these capital flows. There have been numerous papers on examples of financial crises and the effects that these have on other countries. However, no general analysis has ever been conducted on the relation between financial openness and crisis spillovers. The examples from other papers that are based on specific events can however be used to show that a significant relation can be expected in the statistical analysis of this paper.

One of the main examples of crisis spillover effects is the 2008 credit crisis. The fall of big American investment banks caused one of the biggest worldwide crisis of the past century. In the paper by Cheung et al (2010), a causal relation is established between the integration of international capital and stock markets and the expected spillover effects of credit risk. The authors state that the dominant role of the U.S. markets has caused major spillover effects on other financial markets worldwide in the wake of the fall of the Lehman Brothers bank. The paper is mostly about the role of risk and fear in stock markets and other forms of money markets. The paper does not attempt to establish a causal relationship between the much more general term financial openness and spillover effects of a crisis. The paper does however prove that global financial markets which become more integrated and linked to the U.S. can cause major spillover effects.

Another paper that looks at the relations between financial integration and possible spillover effects is the paper by Gulzar et al (2019). In this paper, the focus is on capital and stock markets in emerging Asian countries. The focus period is again on the effects of the 2008 credit crisis and the countries that are examined are Pakistan, India, China, Malaysia, Russia and Korea. The authors want to test for the effects that spillover effects from the U.S. have had on crisis levels in emerging Asian countries. The authors again focus on the stock markets and their returns as do most of the papers in this part of the literature. The authors find a significant relationship between U.S. market shocks and changes in market returns in Asian countries.

The papers that have been discussed in this chapter provide evidence that there are spillover effects between countries that are based on the degree of integration that markets have with each other. This relation that has been proven in many papers brings confidence that an effect between the degree of financial openness of a country and crisis spillover effects exists. The papers that have been discussed and the other literature have only looked at

specific cases where the focus is mostly on financial crises and their relation to stock returns in other countries. This thesis will try to give a broader picture of the general effects that a crisis in another country has on the chance of another country also experiencing a crisis based on their degree of financial openness, which has not been done before in the existing literature.

2.4 the increase of capital controls after the financial crisis of 2008

The second hypothesis of this thesis is related to the numerous international financial control systems that have been imposed after the 2008 financial crisis and the aftermath of this event. The increase in rules and regulations on the capital market is made to improve the well-functioning of this sector. This part of the theoretical framework will work out the changes in financial control systems and regulations. In this chapter, we will also justify why the changes in financial control systems and regulations around the world could have impacted the relationship between the degree of financial openness of a country and possible spillover effects from the crises of other countries. As previously explained the financial crises in the early 2000s have changed the way that policymakers look at financial and capital openness. The risks of unrestricted capital mobility and interbank lending were shown when the global banking system was on the verge of collapsing due to interbank lending and the domino effect that the fall of Lehman Brothers brought on the sector.

The literature on capital controls in general is mostly based on international capital flows and interbank lending. The call for capital controls can be traced back all the way to the Bretton Woods area as stated by Gallager (2011). One of the earlier papers on capital controls is by Edwards (1999). In his paper which was written before the financial crisis, Edwards already explains the scope of capital control systems around the world and how effective they are. Edwards argues that at the time capital controls were easy to surpass and had little effect on the real economy in countries that imposed them. In the years after the financial crisis, The International monetary fund (IMF) was one of the parties that tried to decrease the systematic risk on the capital markets by imposing more capital controls. In the paper by Gallager and Tian (2017), the actions that the IMF has taken to regain control of the financial markets are described. The authors show that the IMF starts advocating for more capital controls in the

reports that the authors have analysed. The paper provides a statistical IV analysis that tests whether the calls for more capital controls have actually resulted in action by the IMF to impose these controls. The authors show that in the period after the financial crisis, there is a significant increase in support from the IMF for capital controls as a result of the financial crisis. This result supports our hypothesis that after the financial crisis, there have been serious changes in the amount of capital controls in the world which could negatively impact the result that the degree of financial openness of a country has on crisis spillover effects.

Other changes in regulations as a direct result of the financial crisis that could impact the relationship between financial openness and crisis spillover effects are related to interbank lending. The fear that interbank lending and the systematic risks that are connected to this may result in a serious economic crisis has existed for long before the economic crisis. In the paper by Rochet and Tirole (1996), the authors state that the rapid growth in interbank lending, which is connected to the financial openness of countries can trigger a rapid downfall of the banking system in case of the bankruptcy of a major bank. The paper states that such a situation will trigger a response by the central bank which has been the case in some situations during the financial crisis. In the paper by Sironi (2018), an analysis is provided to show whether the regulations that are imposed on the banking system have increased since 2008 and whether these extra regulations have been successful. Sironi states that the changes in regulations as formulated by central banks had three main goals: Improve the survival changes of individual banks, Increase the strength of the financial system as a whole and reduce the risk that taxpayers will have to bear the costs of future banking crises. In the statistical analysis of this paper, the author shows that factors such as liquidity and risk reduction by banks have substantially increased. These changes can directly be linked to the increase in regulations from central banks and the IMF. The analysis of the literature in this chapter on capital controls after the 2008 crisis has shown that we have seen a substantial increase in regulations in this time period. These changes in regulations are designed to prevent future enormous banking crises and to stop the spread of the bankruptcy of a bank. These changes in policy are likely to decrease the chances of crisis spillover effects from one country to another as a result of financial openness. In the statistical analysis of this paper, we will test whether the effects that the degree of financial openness of a country has on crisis spillover effects have changed since 2008. If a change in the significance of this relation is found then it is possible that the increase

in financial regulation has decreased spillover effects which would reduce the risks of being a financially open country.

3. Data

In this chapter, the data that will be used in the econometric estimation process will be discussed. For the estimation of the relation between the degree of financial openness of a country and crisis spillover effects we will use a panel data set. The panel data set will consist of 83 countries. The countries that are selected consist of both developed and developing countries with a wide variety of regions and cultures. In terms of financial openness the countries that have been selected vary widely in terms of financial openness which makes the estimation process more valid. The countries in the panel data set have little missing data which makes them the most suitable for analysis purposes. With few missing data points, the fear of bias due to non-random missing data and related measurement error becomes smaller. The time period of the panel data is 1970 until 2016. The main variable of the Chinn Ito index is calculated for this time period only which makes it impossible to extend the data period to previous periods.

Another important dataset that was used for this thesis is the Reinhart database. Reinhart has developed a variable that specifies whether a country is experiencing a banking or a currency crisis in a certain year. These two forms of a crisis are closely related to financial crisis spillover effects and will thus be ideal to measure the relationship between the financial openness of a country and crisis spillover effects. The dataset will contain a dummy that indicates whether a country is experiencing a currency or a banking crisis in a certain year. This dummy will indicate whether a country is having a crisis and will be the main dependent variable of this thesis. Further specifications of the dependent and independent variables can be found in the following methodology chapter. The other main sources for the dataset consist of world bank and IMF data sources. The exact source of the variables in the panel data set can be found in the Excel file that is connected to this thesis and in appendix B.

In the following list, the used main variables are listed with their source followed by a set of control variables that will be included in the main regression of this paper. The exact relation between the main variables and the choice for certain control variables can be found in the following methodology chapter.

14

The main variables that are included in the regression will be:

- The Chinn Ito index for financial openness as described by the Portland state university database on the period of 1970 until 2016
- The data on the occurrence of a banking or a currency crisis as specified in the Reinhart database
- The number of banking or currency crises in a certain year in all countries as specified in the Reinhart database

Other control variables that are included in the regression will be:

- A variable that indicates the logarithm of the price instability of a country as measured by the average inflation in a year
- A variable that indicates the logarithm of the amount of government spending as measured by dividing government spending by GDP called government burden
- The logarithm of the degree of trade openness of a country as measured by diving total import and export values by GDP
- The logarithm of Output per worker
- The logarithm of the degree of financial development of a country as measured by dividing total domestic credit by a country's GDP

4. Methodology

In this chapter, the methodology of this thesis will be discussed. In previous chapters, the theory behind the hypothesis of this paper and the data that will be used have been discussed. Now we will discuss the econometric method that will be used to find statistical evidence for a possible relation between the degree of financial openness of a country and crisis spillover effects. The method that will be used to test for such a relationship will be a difference-in-difference estimation. The difference-in-difference estimation method is used to test for non-biased statistical significance in situations where there is no random sample data available. The method does this by finding a treatment and control group and comparing the difference in trend over time after treatment. The causal effect of the treatment is then specified as the difference between the trend of the control group and the trend of the treatment group. By doing this other time varying variables that affect both the control and the treatment group are filtered out of the effect. This way only the true effect of the treatment is measured. The basic form of a difference-in-difference estimation and the meaning of the variables can be found below in Formula 1. One of the main assumptions of the basic form of this method is the parallel trend assumption. This assumption states that in order to find a non-biased estimation, the trends of the control and the treatment group should be quite similar before the treatment. The use of panel data in a difference-in-difference estimation allows the user of this method to have access to many data points from a limited number of groups. In our specific case, those groups are the 83 countries that are included in the dataset.

$$Y_{it} = \gamma_{si} + \pi_t + \delta_{it} + \varepsilon_{it}$$

Formula 1: the main form of a difference-in-difference design. where Y is the dependent variable at time t for country i, γ_{si} is the group to which the country is assigned, π_t is the parallel trend that both groups have according to the parallel trends assumption, δ_{it} is the treatment effect and ε_{it} is the error term

After the discussion of the difference-in-difference design in general, I will now discuss how the difference-in-difference estimation will be applied to this particular setting. The difference-in-difference estimation process for this setting will differ slightly from the basic difference-in-difference setting. This has 2 particular reasons. The first reason is that in the

setting of this thesis, there is no clear treatment that can take a binary variable as with a standard difference-in-difference estimation. The treatment is the level of the degree of financial openness of a country which can differ in multiple years and can change in different magnitudes. The existence of multiple time periods in which a treatment status can change has been used extensively in the literature and can still be interpreted in a difference-in-difference as shown by Goodman-Bacon (2021). For the reason that there is no clear treatment group at all times in the panel dataset we need to create a control and a treatment group ourselves which will experience a different relation between the degree of financial openness and crisis spillover effects. The goal of this thesis is to compare spillover effects between countries that have a high degree of financial openness and countries that have a low degree of financial openness. The best way to test for this difference is to make a difference-in-difference estimation with control and treatment groups that are allocated due to their position around a certain cut-off point. The cut-off point for the control and the treatment group in this difference-in-difference estimation will be the point that includes about 65% of the datapoints as the treatment group. The reason that this point is chosen is because the literature has proved that only stronger forms of capital controls to decrease the degree of financial openness are effective. The literature splits gate economies which are slightly open and wall economies which are relatively closed. In this thesis the gate economies will be included in the treatment group due to the relative ineffectiveness of their capital controls. One of the papers that looks into the difference between effects on gate and wall economies is the paper by zhou and Kitano (2022)

There can be no clear outliers since the Chinn Ito index can only take on values between -1.9 and 2.3, with a higher value meaning a higher degree of financial openness. Countries that have a degree of financial openness that is below the cut-off point for financial openness will be considered to be the control group. Countries that have a degree of financial openness that is above the cut-off point for financial openness will be considered to be in the treatment group. By doing this it is possible to test for this causal relationship of the degree of financial openness and crisis spillovers. Following from this the main dependent variable will be a dummy variable that equals 1 when a country is experiencing a financial crisis and 0 when the country is not in a financial crisis. The main independent

variable will be the interaction term between the degree of financial openness and the number of crises in other countries in a certain year.

The second reason that the difference-in-difference estimation in this thesis will differ from the standard difference-in-difference estimation is related to the parallel trend assumption. As explained before one of the main assumptions to provide a non-biased estimate in a difference-in-difference estimation is the parallel trend assumption. This assumption states that before the treatment and in case the treatment would not have taken place the trends of the treatment and the control group should have been similar. This is a very strong assumption which is not likely to hold in many cases. For this reason, in the literature there have been many difference-in-difference designs that control for both time-varying and time in varying differences in the treatment set. In the setting of this thesis it is also unlikely that the parallel trend assumption holds. The difference in treatment status is allocated based on the difference in the degree of financial openness of a country. In the original paper by Chinn and Ito (2008), comparative statistics are provided to show the degree of financial openness around the world and for different groups of countries. The authors show that the degree of financial development is much higher in developed countries than in developing countries or emerging markets. By simply doing a difference-in-difference design with treatment status based on a country's degree of financial development, an obvious bias would be created. The treatment group would be much wealthier and more developed regardless of treatment. It is likely to think that more developed countries are also countries with a more developed financial system and other institutions. A more developed financial system and more developed institutions are likely to experience fewer economic shocks and crises. By running a basic difference-in-difference estimation that would not include this variable we would create an omitted variable bias which would decrease the internal validity from the estimations in this thesis. To control for differences in the trend between treatment and control groups it is common for difference-in-difference estimations to include control variables and fixed effects. The control variables have the goal to take away the omitted variable bias that is created due to differences in the control and the treatment group. Not including these controls would leave out variables that have an effect on the dependent variable and are correlated to the independent variables. These variables would remain in the error term which would bias our estimates. The control

variables that control for the most important differences between the treatment and control group related to the degree of financial openness of a country and crises are described in the data chapter.

These controls can only control for time-varying differences in the control and treatment group. To also control for time in varying differences we will include country-fixed effects. These fixed effects will solve for omitted variable bias that is created due to differences in the trend that are not time-varying. The dummy that indicates a crisis will be zero at most times. The differences in trends can be seen as a difference in the amount of crises that occur in the different groups. The fixed effects will pick up these differences and will strengthen the causal interpretation of the results of the difference-in-difference estimation. A final alteration from the standard difference-in-difference estimation method is related to the standard errors. When panel data is used for statistical analysis a possible bias is often related to autocorrelation. In panel data, the observations of certain variables are often related to lagged versions of these variables. This creates possible biases related to autocorrelation. To control for this possible form of error related to autocorrelation we will include heteroscedasticity and autocorrelation robust standard errors.

After including these alterations to the standard difference-in difference-estimation the final form of the regression is given by formula 2 below. The methodology that has been discussed in this chapter will be applied to two different difference-in-difference estimations. First, this paper will run a difference-in-difference estimation based on the full sample over the period of 1970 until 2016 to test for the overall relationship between the degree of financial openness of a country and spillover effects. The second difference-in-difference estimation will be based on the period between 2008 and 2016 to test for the second hypothesis based on capital controls.

$$Crisis_{it} = \beta 0 + \gamma_t + \delta_i + \beta 1 * financial\ openness_{it}$$
$$* \ ammount\ of\ crises\ in\ a\ year_t + \beta 2\ (\mu_{it}) + \varepsilon_{it}$$

Formule 2: The difference-in-difference estimation where γ_t are year fixed effects, δ_i are country fixed effects, μ_{it} are the set of control variables and lagged variables as described in the data chapter and ε_{it} is the error term.

5. Results

In this chapter, the main results of two difference-in-difference estimations that have been produced will be presented and discussed. The goal of this chapter is to test whether there exists a causal relationship between the degree of financial openness of a country and possible spillover effects from financial crises in other countries. The first part of the results chapter will be based on discussing the results of the first hypothesis. These results will be followed by the results of the second difference-in-difference estimation that will provide results on the second hypothesis of this thesis. The results that the difference-in-difference estimation should show according to the hypothesis of this paper is that the interaction term between the number of crises in the world and the degree of financial openness of a country has a positive effect on the chance that a country is experiencing a crisis. If this is indeed what is found then the hypothesis that there is a positive effect of financial openness on crisis spillover effects can be affirmed. For the second difference-in-difference estimation on the period 2008 until 2016 we expect this result to be smaller and less significant. If this is the case then it might be due to the fact that the quality of capital controls has improved since the financial crisis of 2008

The first part of the results chapter will be based on the first difference-in-difference estimation as described in the methodology chapter. This estimation will be based on the relationship between the degree of financial openness and crisis spillover effects over the full period of 1970 until 2016. The main hypothesis of this thesis claims that for countries that have a high degree of financial openness, there is a bigger risk to be faced by a crisis due to spillover effects from other countries. The countries that have a lower degree of financial openness have a lower risk of crisis spillover effects due to their more closed financial and banking systems. This makes it easier for these countries to parry the effects of financial crises from entering their financial systems. The results of this difference-in-difference estimation can be found in table 2. Table 2 includes all the control variables that were mentioned in the data chapter and the fixed effects and robust standard errors that were described in the methodology chapter.

The results in table 2 show a positive significant coefficient for the interaction term between the degree of financial openness of a country and the number of crises in the world

in a certain year. The value of the coefficient is 0.018 and it is significant at the 1% significance level. As explained before the degree of financial openness of a country according to the Chinn and Ito index can take on values between -1.93 and 2.31 where a higher value means that the country is relatively more financially open to other countries. The meaning of the coefficient of 0.018 is that when a country is in the treatment group, raising its degree of financial openness by 1 point increases the risk of a crisis by 1.8 percentage points more than the same action for the control group. A country is in the treatment group when its degree of financial openness is higher than the cut-off point for financial openness for the full sample. This result shows that there is a significant relationship between the chance of experiencing a crisis and the degree of financial development of a country given a certain number of crises in the world. This crisis risk related to financial openness is 1.8 percentage points higher. The coefficient is significant at the 1% level. This result strengthens the main hypothesis of this paper which is:

"When a country has a higher degree of financial openness, it will be more vulnerable to spillover effects of foreign financial crises."

There indeed seems to be a positive causal effect between the interaction term of the degree of financial openness and the number of crises in the world, and the chance of experiencing a crisis in a country. A positive effect between these two variables is exactly what the main hypothesis of this paper states.

Given the scope of the Chinn and Ito index from -1.93 and 2.31 the chance of experiencing a crisis due to spillover effects can rise or decrease by about 7,6 percentage points over the full spectrum of financial openness as measured by the Chinn and Ito index. This percentage indicates that the effect of financial openness on the occurrence of a crisis can be quite high. Decreasing or increasing the degree of financial openness of a country is thus as shown by the results in this chapter an action with more consequences than previously thought. The exact consequences of this finding on policy and the literature will be discussed in the conclusion of this thesis.

Dummy indicating the occurrence of a financial crisis	Treatment effect (Standard error)
Number of crises in the world * Degree of financial openness	0.018*** (0.002)
Degree of financial openness	-0.262*** (0.056)
Log productivity	-2.15*** (0.41)
Log Trade openness	-0.359* (0.19)
Log Government burden	0.659** (0.216)
Log inflation	0.055 (0.425)
Log financial development	0.444* (0.255)
Constant	8.10*** (1.61)

Table 2: difference-in-difference estimation on the relation between the interaction term of the degree of financial openness and the number of crises in the world and a dummy that indicates whether a country is experiencing a financial crisis. The difference-in-difference estimation contains country-fixed effects and robust standard errors. The sample is from the period 1970 until 2016. The number of * indicates the significance level where * means significant at the 10% level, ** means significant at the 5% level and *** means significant at the 1% level.

The second part of this chapter will be used to show the results of the second difference-in-difference estimation from this thesis. In the first part of this chapter, the results for the full sample from 1970 until 2016 were estimated. A positive coefficient of 0.013 was found for this sample. The meaning of the coefficient of 0.018 is that when a country is in the treatment group, raising their degree of financial openness by 1 point increases the risk of a crisis by 1.8 percentage points more than the same action for the control group as described above. this result showed statistical evidence for the first hypothesis of this thesis. in the introduction of this thesis, a second hypothesis was stated as well. That hypothesis was related to recent developments in the field of capital controls on international financial markets. The second hypothesis was:

"International capital controls that have been imposed after the 2008 crisis have made the risk of financial crises spillovers as a result of financial openness less significant."

For this hypothesis, we will run a new difference-in-difference estimation. This statistical estimation strategy will be similar to the estimation strategy that was used for table 2. The difference-in-difference estimation in table 3 will also include both country-fixed effects and robust standard errors. The only difference is that for this difference-in-difference estimation, the sample period will be changed to the period of 2008 until 2016. These are the years after the financial crisis of 2008 until the most recent data availability of the Chinn and Ito index. The goal of this is to see whether the capital controls that have been installed by institutions such as the IMF and governments have already had a measurable effect on the risk of a financial crisis spillover to another country through financial openness. The exact meaning of capital controls and examples of them can be found in the theoretical framework I chapter 2.4 The results of this difference-in-difference estimation can be found in table 3.

The results of this new difference-in-difference estimation in table 3 show interesting results. The main coefficient of interest is again the interaction term between the number of crises in the world and the degree of financial openness of a country. The effect of this coefficient on the chance of experiencing a financial crisis is used to proxy for spillover effects from a crisis in another country through the effects of financial openness. Table 3 shows us a coefficient of 0.013 for this variable. The coefficient is highly significant since it is significant at the 1% level. The result of this coefficient can be interpreted in the same way

as the coefficient in table 2. The meaning of the coefficient of 0.013 is that when a country is in the treatment group, raising its degree of financial openness by 1 point increases the risk of a crisis by 1.3 percentage points more than the same action for the control group.

This result shows some change when comparing the effect that the interaction term between the number of crises in the world and the degree of financial openness in a country has on the chance of experiencing a crisis. The coefficient has decreased from 0.018 to 0.013. The meaning that the results in this chapter have on whether we reject the null hypothesis of the two hypotheses of this thesis will be discussed in the following conclusion chapter.

Dummy indicating the occurrence of a financial crisis	Treatment effect (Standard error)
Number of crises in the world * Degree of financial openness	0.013 *** (0.0022)
Degree of financial openness	-0.062 (0.091)
Log productivity	-1.79 ** (0.59)
Log Trade openness	-1.18 ** (0.45)
Log Government burden	0.619 (0.48)
Log inflation	2.39 (1.70)
Log financial development	0.345 (0.38)
Constant	-4.03 (3.46)

Table 3: difference-in-difference estimation on the relation between the interaction term of the degree of financial openness and the number of crises in the world and a dummy that indicates whether a country is experiencing a financial crisis. The difference-in-difference estimation contains country-fixed effects and robust standard errors. The sample is on the period 2008 until 2016. The number of * indicates the significance level where * means significant at the 10% level, ** means significant at the 5% level and *** means significant at the 1% level.

6. Conclusion

The increasing role of the degree of a country's level of financial openness has been a topic that has received much academic attention in the past decades. Only the literature on different measures for the relatively vague term of "financial openness" is enough to fill many journals. Different facets of financial openness and the effect that it might have on macroeconomic variables has been studied in dept as well. However, one hole in the extensive literature on financial openness was yet to be filled. This paper has focused on the possible relationship between the degree of financial openness of a country and spillover effects that might arise from being relatively financially open. This possible downside of being financially open had not yet been researched and could attribute to the literature as a negative factor of financial openness. This negative effect of being relatively financially open could thus have actual policy relevance through an effect on the real economy and business cycles of a country. Via difference-in-difference estimations, this paper has made an attempt to provide evidence for two academic and policy-relevant hypotheses. The main hypothesis and the first to be discussed is:

"When a country has a higher degree of financial openness, it will be more vulnerable to spillover effects of foreign financial crises."

To test this hypothesis the Chinn and Ito index has been chosen to measure the degree of financial openness of a country. The exact mechanisms through which spillover effects might arise due to the degree of financial openness of a country and the choice for the Chinn and Ito index have been discussed in depth in the theoretical framework of this paper. To test this hypothesis we have run a difference-in-difference estimation where treatment assignment was based on being relatively financially open according to a certain threshold. The results of this difference-in-difference estimation can be found in table 2. The results that were found showed that the difference between the treatment and the control group was a coefficient of 1.8 percentage points per degree of financial openness as measured by the Chinn and Ito index. As discussed in the results, this means that the effect that the interaction term based on financial openness has on the chance of experiencing a financial crisis is 1.8 percentage points higher for countries that are relatively financially open as opposed to countries that are relatively financially closed. The 1.8 percentage points

is per degree of financial openness as measured by the Chinn and Ito index. This interaction term is used to proxy for the term spillover effects in this thesis. The interaction coefficient was highly significant at the 1% level.

The hypothesis of this paper stated that the more financially open a country is, the higher the possible spillover effects due to financial openness will be. The significant and strong coefficient of 1.8 percentage points higher chances of experiencing a financial crisis indeed shows stronger spillover effects for countries that are relatively financially open. Based on the findings of our difference-in-difference estimation there is thus no reason to reject the main hypothesis of this paper.

In addition to the main hypothesis, this paper has tried to investigate the role that the degree of financial openness will have in the future. In the theoretical framework of this paper, the most recent developments in the field of capital controls have been discussed. One of the goals that capital controls have is that they try to prevent crises from spilling over from one financial market to the other. When these financial control systems become more developed they might diminish the spillover effects that arise from financial openness. When this is the case, becoming more financially open will be more attractive for countries. In the wake of the financial crisis of 2008, there has been a big movement among policy-making institutions to increase capital controls on financial markets. Examples of the imposed capital controls after the financial crisis of 2008 have been given in the theoretical framework of this paper. From the increase in capital controls and the possible effect that this might have on crises spill over effects linked to financial openness a second hypothesis was created:

"International capital controls that have been imposed after the 2008 crisis have made the risk of financial crises spillovers as a result of financial openness less significant."

To test this hypothesis, a second difference-in-difference estimation has been made. The difference from the first difference-in-difference estimation was that for this estimation only the data for the period of 2008 until 2016 has been included. This data includes all the years that are available for the Chinn and Ito index after 2008. The results of this difference-in-difference estimation are presented in table 3. The coefficient that was found for the interaction term between the degree of financial openness and the number of crises in the

world was 1.3 percentage points. As discussed in the results, this means that the effect that the interaction term based on financial openness has on the chance of experiencing a financial crisis is 1.3 percentage points higher for countries that are relatively financially open as opposed to countries that are relatively financially closed. The interaction term is used to proxy for the term spillover effects in this thesis. This coefficient was highly significant at the 1% level.

The second hypothesis states that the spillover effects due to financial openness should have decreased after the financial crisis of 2008. The coefficient that was found through the difference-in-difference estimation is indeed lower. The spillover effects have decreased by 0,5 percentage points. This decrease is perhaps lower than might be expected due to the extent of capital controls that have been imposed after the financial crisis. However, some of the capital controls have been imposed much later in the crisis than at the beginning of 2008. The effect of these controls might not yet be measurable and will need more years of data to see an effect. The discussion of this will continue in the discussion chapter below. Based on the current findings of the difference-in-difference estimation that is presented in table 3 there is no evidence to reject the second hypothesis of this paper. Further research will however be necessary to establish a causal relationship between the increase in capital controls after 2008 and the decrease in spillover effect due to financial openness.

7. Discussion and future research recommendation

This thesis has focused on exploring the possible spillover effects of crises due to a country's degree of financial openness. The results of the statistical analysis of this paper showed significant results. These results proved that the hypotheses could not be rejected based on the findings of this paper. There has been an extensive discussion of the different assumptions that were made and how certain choices could be justified. After the remarks that were made in this paper, there still remains some limitation to the methodology of this paper that should be discussed to give a true picture of the validity of this paper. The discussion of the validity of this paper will be accompanied by future research recommendations. These recommendations have the goal of guiding future research in a direction that could overcome these challenges. There will also be recommendations for follow-up research on this topic and topics that are related to spillover effects due to the degree of financial openness of a country.

The first point that will be discussed is related to the second hypothesis of this paper. In the conclusion, we have already brought up an issue related to the validity of these results. The issue relates to the timing of certain capital controls and the timespan on which they will have effect. Many of the policies that were put into place as a result of the 2008 crisis and follow-up crises have gone into effect years after 2008. The effects of these capital controls can take even longer too become visible. It is hard to map the exact timing of capital controls since there are too many of them on different levels. The exact results of them can never be measured precisely since fiscal and monetary policy does not happen in a vacuum. Many other factors influence macroeconomic outcomes which makes it impossible to measure the precise effects of a policy. The solution in this paper was to simply look at the pre-2008 period in order to see the overall results of the capital controls that have been imposed. Many of these additional controls have not been in place over the entire period which makes it hard to establish a causal effect between the increase of capital controls and the decrease in spillover effects due to financial openness. By increasing the time period of the panel data and seeing how spillover effects influence future financial crises it should be possible to get a clearer picture of the relationship between capital controls and spillover effects due to financial openness. There is however at the time of writing not enough data to

extend this research. Future research should be able to further review this relationship and give more insights into it.

The second point that will be discussed is related to the parallel trend assumption that has to hold in order to establish a causal effect via a difference-in-difference estimation and the overall internal validity of this paper. As discussed in the methodology the parallel trend assumption indicates that pre-treatment, the trends of the two groups should be similar for a difference-in-difference estimation. For the control and treatment group in our sample, we have used countries that are relatively financially open as the treatment group and countries that are relatively financially closed as the control group. The parallel trends assumption is unlikely to hold for these two groups as they consist of countries and time periods that are very different from each other. To control for these differences additional control variables and fixed effects were added to take out the differences in the trend. These control variables consist of the most important differences between the two groups related to the occurrence of a crisis and spillover effects due to the degree of financial openness of a country. While including these control variables has certainly improved the internal validity of the difference-in-difference estimation, it is hard to truly be certain that the parallel trend assumption now holds. The recommendation for future research would be to test the hypotheses by another statistical method. By using another statistical method, it would be possible to test whether the results between these two methods match. Finding matching results would be a confirmation that both statistical methods are likely to be internally valid. It would also make it more likely that the parallel trend assumption is holding in this paper. A second point that should be discussed relating to the internal validity of this paper concerns the absence of the number of crises in the world from the main regressions. This variable has not been included in the regressions since its addition created extremely counterintuitive results. The fear might exist that by dropping this variable we create omitted variable bias. Changing the meaning of the crisis variable could change the odd results that this variable on itself brings into the results. Future research should focus on the exact effect of the number of crisis in the world on crisis spill over effects to improve the internal validity of this paper.

This paper has tried to give an overall insight into the relationship between the degree of financial openness of a country and crisis spillover effects. By using the Chinn and

Ito index we have tested for a wide definition of financial openness which includes variables such as capital mobility, banking regulations and exchange rates. One of the goals of this paper is to provide policy-relevant results in order to improve the decisions making related to financial openness. The policy relevance of this paper would be improved if it would be clearer which part of the financial openness spectrum causes spillover effects. Future research should focus on identifying the effects that the different facets of financial openness have on crisis spillover effects. By further specifying the exact origins of the spillover effects due to the degree of financial openness of a country, The results of this part of the literature would become even more policy relevant. Regulations and other forms of government interventions would be better directed which could even further decrease crisis spillover effects.

8. Robustness check

In addition to the extensive discussion of the statistical methods that have been presented, an additional robustness check will be added to improve the internal validity of this paper. As discussed in the data chapter, the variable that indicates whether a country is experiencing a crisis is built up out of two separate financial crisis forms. The two forms of crisis are the currency crisis and the banking crisis. Both of the crisis forms are linked to important factors of the Chinn and Ito index. In the statistical analyses, the overall effect that the degree of financial development of a country has on these two crisis forms has been calculated. While both forms of crises are linked to the Chinn and Ito index, it might be that one of them is much more sensitive to crisis spillover effects than the other. To test for differences in the chance of a crisis spillover we will now test for both the crisis forms separately. The exact same difference-in-difference estimation will be run as for table 2. The only difference is that the dependent variables crisis will now be split into a currency crisis and a banking crisis. The results of these two difference-in-difference estimations can be found in table 4 and 5.

The result of the difference-in-difference estimation for a banking crisis is given in table 4. The results are a bit lower than the full sample results of table 2. The coefficient that was found for the interaction term between the degree of financial openness and the number of crises in the world was 1.5 percentage points. This means that the effect that the interaction term based on financial openness has on the chance of experiencing a banking crisis is 1.5 percentage points higher for countries that are relatively financially open as opposed to countries that are relatively financially closed. The results also show that the coefficient is still significant at the 1% level.

In table 5 the results can be found for the spillover effects on a currency crisis. The results show a lower coefficient than for the banking crises. The coefficient is only 1 percentage points per degree of the Chinn and Ito index. This means that the effect that the interaction term based on financial openness has on the chance of experiencing a banking crisis is only 1 percentage points higher for countries that are relatively financially open as opposed to countries that are relatively financially closed. As can be seen, the spillover coefficient is significant at the 1% level

The results from this robustness check have shown that the spillover effects on different forms of crises are not always similar. In the main regression, both currency and banking crises were taken into account. The results that were found in that estimation were 1.8 percentage points. In table 4 we only considered the spillover effects on banking crises. The effects that were found were quite close to the overall estimation with a coefficient of 1.5 percentage points. When looking at the spill over effects on a currency crisis in table 5 we found lower results. The coefficient was only 1 percentage points. The results of this robustness check have shown that the occurrence of a banking crisis is more related to spillover effects due to financial openness than a currency crisis. However, both forms of crises showed a significant positive spillover effect which makes them both relevant to include in the overall analyses of spillover effects due to financial openness.

Dummy indicating the occurrence of a banking crisis	Treatment effect (Standard error)
Number of crises in the world * Degree of financial openness	0.015 *** (0.0031)
Degree of financial openness	-0.21*** (0.075)
Log productivity	-1.76*** (0.62)
Log Trade openness	0.40 (0.31)
Log Government burden	0.494 (0.33)
Log inflation	-0.704 (1.33)
Log financial development	0.541 (0.29)
Constant	6.69 (3.95)

Table 4: difference-in difference-estimation on the relation between the interaction term of the degree of financial openness and the number of banking crises in the world and a dummy that indicates whether a country is experiencing a financial crisis. The difference-in-difference estimation contains country fixed-effects and robust standard errors. The sample is from the period 1970 until 2016. The number of * indicates the significance level where * means significant at the 10% level, ** means significant at the 5% level and *** means significant at the 1% level.

Dummy indicating the occurrence of a currency crisis	Treatment effect (Standard error)
Number of crises in the world * Degree of financial openness	0.010 *** (0.0019)
Degree of financial openness	-0.205*** (0.05)
Log productivity	-0.391 (0.356)
Log Trade openness	-0.812*** (0.23)
Log Government burden	0.18 (0.36)
Log inflation	-0.79*** (0.27)
Log financial development	0.326 (0.17)
Constant	3.99** (1.67)

Table 5: difference-in-difference estimation on the relation between the interaction term of the degree of financial openness and the number of currency crises in the world and a dummy that indicates whether a country is experiencing a financial crisis. The difference-in-difference estimation contains country fixed-effects and robust standard errors. The sample is from the period 1970 until 2016. The number of * indicates the significance level where * means significant at the 10% level, ** means significant at the 5% level and *** means significant at the 1% level.

Appendixes

The following chapter will contain the 2 appendixes of this thesis. Appendix A will consist of the list of countries that have been used to estimate the spillover effects of a crisis due to financial openness. Appendix B will consist of the list of variables that were used in this estimation together with their source.

Appendix A: List of countries and their country code from the dataset

Algeria	Argentina	Australia
DZA	ARG	AUS
Austria	Bangladesh	Belgium
AUT	BGD	BEL
Bolivia	Botswana	Brazil
BOL	BWA	BRA
Burkina Faso	Canada	Chile
BFA	CAN	CHL
China	Colombia	Congo republic
CHN	COL	COD
Congo Democratic republic	Costa Rica	Cote de Ivoire
COG	CRI	CIV
Denmark	Dominican Republic	Ecuador
DNK	DOM	ECU
Egypt	El Salvador	Finland
EGY	SLV	FIN
France	The Gambia	Germany
FRA	GMB	DEU
Ghana	Greece	Guatemala
GHA	GRC	GTM
Haiti	Honduras	Iceland
HTI	HND	ISL
India	Indonesia	Iran

IND	IDN	IRN
Ireland IRL	Israel ISR	Italy ITA
Jamaica JAM	Japan JPN	Jordan JOR
Kenya KEN	Korea KOR	Madagascar MDG
Malawi MDI	Malaysia MYS	Mexico MEX
Morocco MAR	The Netherlands NLD	New Zealand NZL
Nicaragua NIC	Niger NER	Nigeria NGA
Norway NOR	Pakistan PAK	Panama PAN
Papua New Guinea PNG	Paraguay PRY	Peru PER
Philippines PHL	Portugal PRT	Senegal SEN
Sierra Leone SLE	Singapore SGP	South Africa ZAF
Spain ESP	Sri Lanka LKA	Sweden SWE
Switzerland CHE	Syria SYR	Thailand THA
Togo TGO	Trinidad and Tobago TTO	Tunisia TUN
Turkey TUR	Uganda UGA	United Kingdom GBR
United States USA	Uruguay URY	Venezuela VEN

Zambia	Zimbabwe	
ZMB	ZWE	

Appendix B: source of used variables

The occurrence of a Currency or banking crisis	Global crisis data by country, Reinhart database
The Degree of financial openness of a country	Chinn and Ito index annual, Portland state university website
The Productivity level of a country	Up to 1999: micro time series_annual.xls After 1999: Ilostat database
The level of trade openness of a country	Trade database from the world bank website
The government burden of a country	Annual government consumption data from the world bank website
The inflation rate of a country	Macro trends database from the world bank website
The degree of financial development of a country	Financial structure database from the world bank website

Bibliography

Bekaert, G., Harvey, C. R., & Lundblad, C. (2011). Financial openness and productivity. *World Development*, *39*(1), 1-19.

Cheung, W., Fung, S., & Tsai, S. C. (2010). Global capital market interdependence and spillover effect of credit risk: evidence from the 2007–2009 global financial crisis. *Applied Financial Economics*, *20*(1-2), 85-103

Chinn, M. D., & Ito, H. (2008). A new measure of financial openness. *Journal of comparative policy analysis*, *10*(3), 309-322.

Edwards, S. (1999). How effective are capital controls?. *Journal of Economic Perspectives*, *13*(4), 65-84.

Gallagher, K. P., & Tian, Y. (2017). Regulating capital flows in emerging markets: the IMF and the global financial crisis. *Review of development finance*, 7(2), 95-106.

Gallagher, K. (2011). Regaining control? Capital controls and the global financial crisis. *Political Economy Research Institute Working Paper*, (250).

Goodman-Bacon, A. (2021). Difference-in-differences with variation in treatment timing. *Journal of Econometrics*, *225*(2), 254-277.

Gulzar, S., Mujtaba Kayani, G., Xiaofen, H., Ayub, U., & Rafique, A. (2019). Financial cointegration and spillover effect of global financial crisis: A study of emerging Asian financial markets. *Economic research-Ekonomska istraživanja*, *32*(1), 187-218.

Jayadev, A. (2007). Capital account openness and the labour share of income. *Cambridge Journal of Economics*, *31*(3), 423-443.

Miniane, J. (2004). A new set of measures on capital account restrictions. *IMF Staff Papers*, *51*(2), 276-308.

Quinn, D. P., & Inclan, C. (1997). The origins of financial openness: A study of current and capital account liberalization. *American Journal of Political Science*, 771-813.

Quinn, D., Schindler, M., & Toyoda, A. M. (2011). Assessing measures of financial openness and integration. *IMF Economic Review*, *59*(3), 488-522.

Rajan, R., & Zingales, L. (1998). Financial development and growth. *American economic review*, *88*(3), 559-586.

Rochet, J. C., & Tirole, J. (1996). Interbank lending and systemic risk. *Journal of Money, credit and Banking*, *28*(4), 733-762.

Tamirisa, N. T., & Johnston, R. B. (1998). Why Do Countries Use Capital Controls?. *IMF Working Papers*, *1998*(181).

Zhang, C., Zhu, Y., & Lu, Z. (2015). Trade openness, financial openness, and financial development in China. *Journal of International Money and Finance*, *59*, 287-309.

Zhou, Y., & Kitano, S. (2022). *Effectiveness of Capital Controls: Gates versus Walls* (No. DP2022-38).