The Dollar Malaise: Global Integration of Currencies

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To my role model - my Mother.

I am here solely because you are here.

PREFACE

" We are at our very best, and we are happiest,

when we are fully engaged in work we enjoy,

on the journey toward the goal we've established for ourselves.

It gives meaning to our time off and comfort to our sleep.

It makes everything else in life so wonderful, so worthwhile."

- Earl Nightingale -

Writing a Doctoral Thesis is a Privilege.

DECLARATION

The following publications have been produced as a direct or indirect result of the research study discussed in this thesis:

Papers in Journals

Ghebrezghi, Helen. 2018. "Liquidity operations during the financial crisis 2008/09: evidence from the relations between Korean won onshore and offshore markets." *Macroeconomics and Finance in Emerging Market Economies* 11 (4).

Papers in Journal Review Process

Ghebrezghi, Helen. 2018. "Non-deliverable forward and spot markets: The impact of the Eurozone Crisis on South Korea." *Journal of the Asia Pacific Economy.*

Ghebrezghi, Helen. 2018. "Capital movements in Germany under Bretton Woods." *Essays in Economic & Business History*.[1]

Papers in conference proceedings

Ghebrezghi, Helen. 2016. "Market Integration and Exchange Rate Regime: Evidence from the Relations between Korean Won Onshore and Offshore Markets." 4th Econometric Conference, Centre for Economic Analysis, Rimini.

Ghebrezghi, Helen. 2017. "Liquidity operations during the financial crisis 2008/09: evidence from the relations between Korean won onshore and offshore markets." 12th BiGSEM Doctoral Workshop on Economic Theory.

Ghebrezghi, Helen. 2017. "Liquidity operations during the financial crisis 2008/09: evidence from the relations between Korean won onshore and offshore markets." 1st International Conference on Energy, Finance and the Macroeconomy, Montpellier Business School.

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[1] Revision in second stage.

Ghebrezghi, Helen. 2017. "Liquidity operations during the financial crisis 2008/09: evidence from the relations between Korean won onshore and offshore markets. 16th Econometrics Workshop "Recent Developments in Econometrics Applied to Finance." University of Paris Nanterre.

Ghebrezghi, Helen. 2017. "Liquidity operations during the financial crisis 2008/09: evidence from the relations between Korean won onshore and offshore markets." 2017 International Conference on Research Optimization in Field of Economics and Social Sciences, Seoul.

LIST OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

LIST OF ABBREVIATIONS

ADB	Asian Development Bank
ARCH	Autoregressive Conditional Heteroscedasticity
AREAER	Annual Report on Exchange Arrangements and Exchange Restrictions
BIS	Bank for International Settlement
BOJ	Bank of Japan
BOK	Bank of Korea
BRI	The Belt and Road Initiative
BRL	Brazilian Real
CN	China
CNY	Chinese Renminbi
DE	Germany
DM	Deutsche Mark
EMS	European Monetary System
EMU	Economic and Monetary Union
FDI	Foreign Direct Investment
FII	Foreign Institutional Investor
FX	Foreign Exchange
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
GDR	German Democratic Republic
HKMA	Hong Kong Monetary Authority
IDR	Indian Rupee, Indonesian Rupiah
IFI	International Financial Institution
IL	Israel, Israel
IMF	International Monetary Fund
IN	India
INR	Indian Rupee
IPF	Implied Forward Rate
IR	Interest Rate
IRS	Interest Rate Swaps
J-B	Jarque-Bera
JP	Japan

KR	Korea
KRW	Korean Won
L-B	Ljung-Box
MA	Moving Average
MoF	Ministry of Finance
MOFCOM	Ministry of Commerce
MYR	Malaysian ringgit
NDF	Non Deliverable Forward
OTC	Over the Counter
PBOC	People's Bank of China
PHP	Philippine Peso
PPP	Purchasing Power Parity
RMB	Renminbi
RU	Russia
RUB	Russian rouble
SA	South Africa
SDR	Special Drawing Rights
TW	Taiwan
TWD	Taiwanese Dollar
U.K.	United Kingdom
U.S.A	United States of America
UN	United Nation
UNSC	United Nations Security Council
WFE	World Federation of Exchanges
WTO	World Trade Organization
WWI	World War I

INTRODUCTION

The global financial crisis, which had its centre-point in the United States, raised speculation about the US dollar's imminent displacement as the world's largest international currency. Many scholars and financial analysts were predicting the end of the US dollar's dominant role in the international monetary system. Krugman (2007), for example, wrote that "almost everyone believes that the US current account deficit must eventually end, and that this end will involve dollar depreciation (p.1)". The World Bank and the International Monetary Fund also predicted a decline in the US dollar's value and the consequences this would inevitably have for the global economy. But these analysts, at least for now, have been proven wrong, since the opposite has happened. During the height of the crisis, money was flowing back into the United States, and foreign investors, who were searching for a safe-haven currency for their money, added to the inflow.

After the dollar dethroned the British pound – be it after World War II, as some scholars argue, or as early as the 1920s – the US dollar has been the world's leading global currency. The end of the gold standard in 1973 did not upset the dollar's role within the international monetary system, but the growing gap of the US economy and financial markets compared to other economies enhanced the dollar's status as the most powerful currency in the world.

The question whether the dollar is losing its international role first emerged seriously in the 1990s, when the Deutsche Mark and Japanese Yen had made increasing gains during the 1970s and 1980s. The strong German and Japanese economies, low inflation, and a current surplus suggested that the US dollar might be dethroned. But this event did not occur. The introduction of the Euro in 1999 was the first serious competitor to the dollar in the post-war era. The European Monetary Union has been a fusion of Europe's economic power, and its influence in the global economy can challenge the US economy and consequently the role of the US dollar. But the European Sovereign Debt Crisis has challenged the Eurozone, and so far the Euro is lagging behind the US dollar.

Around the globe, financial markets are becoming more developed, which gives private and official actors new opportunities. China is an economic superpower, and with an annual GDP of 11.5 trillion US dollars it ranks as the second largest economy in the world. Hence, it is no surprise that the Chinese government is taking steps to promote the use of the Renminbi. The Chinese government is promoting the Renminbi carefully and without losing control. Its role

in international trade and investment plays a key factor for the Renminbi's internationalisation. Besides China's economic muscle, the government is also pushing a global political agenda and is influencing the global world order. However, the Renminbi is still in its early stages of international influence and does not yet play an international economic role, with the low level of the financial market's development being a major constraint.

Promoting a currency's global role is tied with many complex domestic and geopolitical considerations. But an international monetary system in which more than one currency shares the global role will be an improvement upon a system in which countries have no alternatives other than the US dollar.

This dissertation stands as a reflection of my broad interest in the monetary policy of developing countries. There is a wide body of literature that covers different aspects of this field of study, but the list of questions that have not been fully unanswered remains long. My thesis takes a different evolutionary course to contribute to our understanding of the future structure of the international monetary system. While the three chapters address a range of different monetary policies and contexts, they are bound together by this common interest and by the way that they complement each other.

Bearing in mind the ongoing discussion about the future of the US dollar as an international currency, the first chapter sheds light on the development of the global currency system and the relationship between the economic factors of an international currency and a country's power. The foundation of a country's power lies in the ability of a country, person, or group to govern or influence the outcome, "such that their preferences take precedence over the preferences of others" (Strange, 1996). Most studies analyse currency internationalisation through an economic lens, but I have opted to focus particularly on the neglected area of political factors of currency internationalisation. Countries that have international economic and political power and that seek to use this power can increase their international monetary power. The exercising of monetary power can be performed in different ways. The reason that I analysed the political factors of currency internationalisation is motivated by a bid to obtain and present a better understanding of the functioning and future of our monetary system, and consequently of international currencies.

In the second chapter, I study the growth of the external currency market, also referred to as an offshore market. Emerging market economies like China and Korea began after the Global Financial Crisis in 2007/08 to enhance the circulation of their currency outside of their

jurisdictions. Their goal has been to reform their currencies' international monetary system, where the dollar still dominates. This chapter concentrates on the risks of a circulating currency outside its borders for Emerging Market Economies. After introducing this subject generally, it presents case studies of the monetary development of the Japanese Yen, Chinese Renminbi, and Korean Won, followed by the introduction of the theory of the Non-deliverable forward (NDF) market. The NDF market is the heart of this chapter. In its second half, I carry out an econometric analysis about the largest NDF market, namely the Korean won, and show how the NDF market reacted during the Global Financial Crisis.

The third and final chapter addresses the Deutsche Mark's monetary and economic development in the late 1960s and early 1970s. During this time Germany practiced a long-standing policy of not encouraging the internationalisation of the Deutsche Mark. Therefore, attention will be given to the time-frame between 1967 and 1973 in which the Bundesbank fought against destabilizing capital movements. The attractiveness of the Deutsche Mark posed a real threat to the central bank of the Federal Republic of Germany, the Bundesbank, since they had only a limited scope to act and take measures, given the fixed exchange rate system. This chapter will revisit the sources that triggered five speculative waves of capital inflow against the Deutsche Mark and that caused ineffectiveness in the German capital controls program in resisting the pressure for re-valuation.

These three chapters together present a rich theoretical and empirical discussion of the present development of international currencies and contribute to the existing literature on three levels. First, they do so by analysing the present status of the leading dominating currencies. Besides the ongoing and widely ranging discussions about the economic factors that drive an international currency, the first chapter discusses the political power that determines an international currency. For instance, is there a causal relationship between military expenditure and the key currency status of a country? The second chapter builds on the first chapter by examining what happens to countries that plan to promote their currency internationally. Financial markets around the world are developing, and there is an increasing recognition of the breadth and sophistication of their financial products and the services they offer. But there are important questions that remain unanswered, such as: What are the benefits and cost of an emerging market currency to become a truly international currency? These two chapters have raised the question whether there was a country that had the capability and opportunity to promote their currency but was reluctant to do so. This will be answered in the third chapter through the case-study of the Deutsche Mark. The Deutsche Mark was one of the most

successful currencies in the world and seemingly fulfilled all the requirements for an international currency. The Deutsche Mark was able to play an international role in the economy, but the reluctance of the authorities presents a different view concerning the ongoing process of currency internationalisation in emerging market economies.

The discussions and conclusion of this dissertation will give an updated framework for the future of the international monetary system.

"A fundamental reform of the international monetary system has long been overdue. Its necessity and urgency are further highlighted today by the imminent threat to the once mighty U.S. dollar."

[Robert Triffin, November 1960]

CHAPTER I

THE POLITICAL ECONOMY OF AN INTERNATIONAL CURRENCY

I.1 International Currencies Today

In the 1990s the question arose whether the dollar was losing its role as an international currency (Chinn and Frankel, 2008). The reason was the growth of West Germany's Deutsche Mark and later the Japanese Yen, measured by shares in their central banks' holdings of foreign reserves. However, up to the present day the dollar is still the dominant international currency. Research undertaken by Prasad (2014) has recently unveiled that, during the global financial and Eurozone crisis, the share of holdings in US dollars grew while the share of the Euro fell. This outcome signals that the US dollar still constitutes the world's most influential single international currency. Nonetheless, the introduction of the Euro and the process of gradual financial liberalization in China have led to greater discussion about the future status of the US Dollar as a key international currency. The 2017 annual report of the European Central Bank, for example, showed that the Euro has continued to be relatively unchallenged as the second most important international currency.[2]

Still, today's China is very ambitious to push the Renminbi globally. One key event for the internationalisation of the Renminbi was its joining of the International Monetary Fund (IMF) Special Drawing Rights (SDR) basket in October 2016.

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[2] European Central Bank, Report 2017.

The criteria of becoming and maintaining an international currency have been a focus of monetary scholars for many decades. For instance, Mundell (1998) and Eichengreen (2005) both focussed on a country's economic size, the effects of its diversification, and political stability, while McKinnon (1998) and Kenen (1983) concentrated on network externalities and well-developed financial markets. Being held as reserves such as international bonds, short-term instruments, and official reserves also constitutes an important driver for an international currency. Thus, a future international currency needs a stable value in terms of goods and services, and should not be prone to become inflated away. Instability in a currency's value increases the holding risks and inflation can reduce its purchasing power.

A summary of market shares in Table 1.1 and Figure 1.1 below shows that, over the period 2000-2017, the Euro's shares declined and that the dollar is still the leading reserve currency.[3]

Table 1.1 Currency shares of foreign exchange reserves

	2000	2001	2002	2009	2012	2013	2014	2015	2016	2017
US Dollar	71.13%	71.51%	66.50%	62.05%	61.47%	61.24%	65.14%	65.72%	65.34%	62.70%
EUR	18.29%	19.18%	23.65%	27.66%	24.05%	24.20%	21.20%	19.14%	19.13%	20.15%
Japanese Yen	6.06%	5.04%	4.94%	2.90%	4.09%	3.82%	3.54%	3.75%	3.95%	4.89%
Pound Sterling	2.75%	2.70%	2.92%	4.25%	4.04%	3.98%	3.70%	4.71%	4.34%	4.54%
Swiss Franc	0.27%	0.25%	0.41%	0.12%	0.21%	0.27%	0.24%	0.27%	0.16%	0.18%
Chinese Renminbi									1.08%	1.23%

Source: International Monetary Fund.

Figure 1.1 Currency shares of foreign exchange reserves
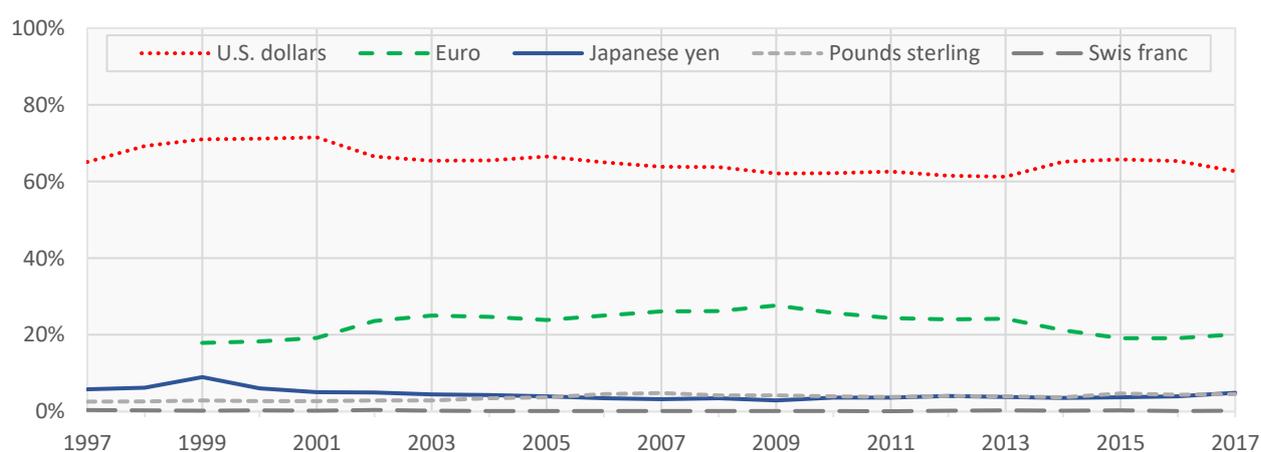
Source: International Monetary Fund.

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[3] The shares shown for the Euro prior to its introduction in 1999 are an accumulation of the French Franc, Deutsche Mark and the legacy currencies.

The development in foreign exchange reserves supports the views of Mundell (1998a) and Eichengreen (2005) in terms of the strong role played by diversification within the international currency system. However, economic conditions and factors explain only half the tale, since every economic question has a political aspect and cannot be viewed in isolation (Kindleberger, 1970). The political and economic landscape jointly affect the foreign relationships of a country, and subsequently also the international status of their currency. According to Helleiner (2008), politics can influence the international status of a currency through either direct or indirect channels. Through the direct channel, politics impact upon a currency use directly; for instance, the US authorities implemented a "dollarization policy" in many Latin American countries to enhance the use of the dollar. The indirect channel, on the other hand, relates to political circumstances that affect the international use of a currency by influencing economic factors. For example, when the dollar began to increase in value during the 1920s, the Federal Reserve began to promote the dollar as an international currency by establishing a market of dollar-denominated acceptability. In other words, in order to understand currency internationalisation, it is essential to understand a country's power and how it relates to other countries. International political power can increase the foreign use of its currency through inducement, for instance by offering to another country military provisions, or economic and diplomatic support. It can promote the use of its national currency by enlarging its soft power, since a foreign country's military and economic dependence tends to generate the incentive for it to strengthen the relationship by using its currency (Chey, 2013).[4]

This has also been demonstrated by the study of Eichengreen et al. (2017), who used data on the foreign exchange reserve prior to World War I (WWI), and found "that military alliances boost the share of a currency in the partner's foreign exchange reserve portfolio by close to 30 per cent."[5] In his study, Eichengreen et al. (2017) argued that the reason for this is diplomatic and military power: countries see it as being in their own geopolitical interest to use their own currency for international transactions. Figure 1.2 shows the predicted and actual shares of the main reserve currencies of five countries' foreign reserve holdings that all engaged in defence pacts with the issuer before WWI (Eichengreen et al. 2018). The bar charts of the predicted shares, which included defence-pact effects, have the same length when compared with the bars which excluded the defence-pact effects.

Figure 1.2 The importance of geopolitical versus economic factors in reserve currency choice

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[4] See also Chey et al. (2016).
[5] Eichengreen et al. (2018).
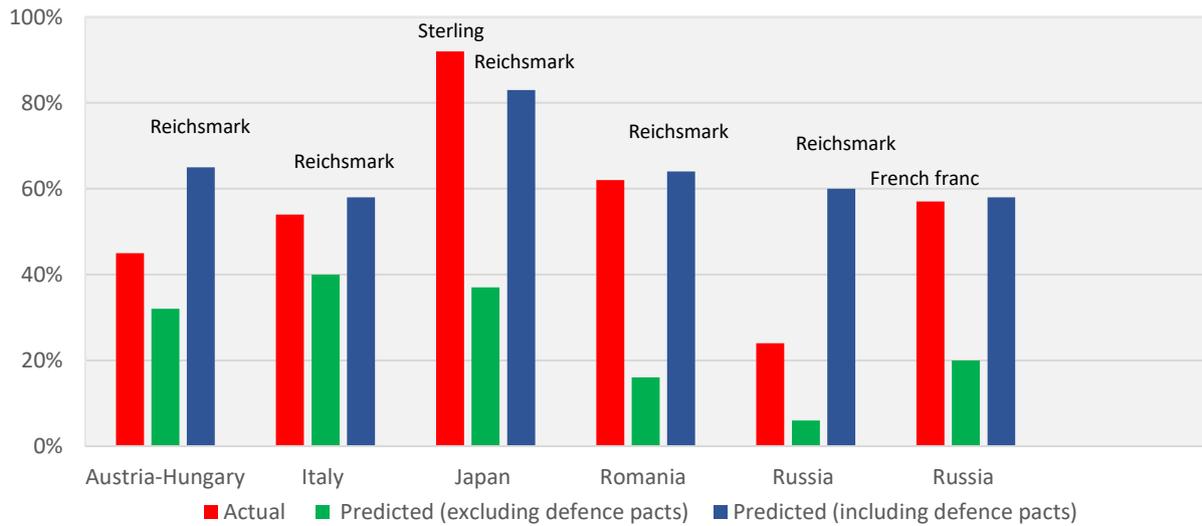
Source: Eichengreen et al. (2017).

Hence, this creates a network effect that drives a currency toward market dominance, which in turn explains how the number of currencies circulating at the same time is limited.[6] The structure and framework of a single currency's power has been created by the security that is provided by the offering country for other countries. This provision of security by the offering country has thus created a structure and framework for monetary power. The exercising of currency power takes place in the sphere of international monetary relations, which is also the arena that plays host to governing the relationship between currency power and monetary relations. Some important questions to ask here include the following: How do countries exercise monetary power? How and when does monetary power rise, reach its zenith, and eventually decline? The complex answers to these questions are to be explored at greater length in this chapter.

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[6] See for instance Krugman (1984).

I.2 Theories of International Currencies

Attractive currencies may be employed outside their jurisdiction of origin for a number of reasons. International monetary economics is still seeking to find an adequate definition of international currencies. The most widely used taxonomy for describing the role of international money was first expounded by Cohen (1971), and is illustrated in a 3X2 matrix in Table 1.2 below.[7]

Table 1.2 The roles of International money

List of Analysis	Medium of Exchange	Unit of Account	Store of Value
Private	Foreign exchange trading, trade settlement	Trade invoicing	Investment
Official	Intervention	Anchor	Reserve

Source: Cohen (1971).

An international currency is by definition one that is used and held outside the borders of the issuing country for transactions between non-residents and residents (Kenen, 2009). A more theoretical definition of an international currency has been proposed by Cohen in his papers in the early 1970s on the British pound sterling.[8] This definition has been later refined by Peter Kenen (1983) and Paul Krugman (1984). What they defined as an international currency requires three functions to be fulfilled. First, an international currency should be used as a medium of exchange among private participants to settle international economic and financial transactions, or otherwise by authorities as a currency to intervene in the foreign exchange market. Second, as a unit of account, it denominates trade and financial transactions at a private level, and at the public level it plays the role of an anchor currency for pegging the domestic currency. Third, an international currency should be able to be used as a store of value, which means its use at the private level as an investment asset, and at the public level as a reserve currency (Chinn and Frankel, 2005).[9]

The three functions – medium of exchange, unit of account, and store of value – occupy two levels of analysis in accordance with the private and official policies respectively, and they are distinct in both practical and analytical terms. At the private level, functions include foreign

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[7] A slightly different version of the table was reprinted by Krugman (1984).

[8] Cohen (1971).

[9] Each of these functions can be interrelated to a greater or lesser degree with the others. However, Thimann (2009) proposed a new idea of international currencies. It encompasses both cross-border and domestic use of currencies to measure the use of a currency and its importance for the global economy.

exchange trading (medium of exchange), trade invoicing (unit of account), and financial markets (store of value) (Cohen, 2014).[10] At the official level, the role of an international currency is defined as an exchange rate anchor (unit of account), intervention currency (medium of exchange) or as a reserve currency (store of value) (Cohen, 2014). An international currency may be defined as one that performs all of the six roles, but also changes the scope of monetary geography by highlighting the hierarchical relationship between currencies.

Nevertheless, it is still problematic to properly point out the choice of a currency that is to be used for international transactions. For instance, Krugman (1984) explained that international currencies are the result of an 'invisible hand' rather than international agreements. Therefore, the question is: Does the existing theory deal with different aspects which underlie the use of national money by non-residents, and explain the behaviour of private and officials? There is a wide body of literature that has characterized a number of determining variables that make a currency suitable for an international status.[11] The following sub-chapters will give a general overview of the most widely used factors that describe an international currency.

I.2.1 Stability

To provide a global currency, a key issue is stability, e.g. by ensuring that the value of a currency should not swing widely. For instance, turmoil arising from an unstable rate of inflation can add costs to use of the currency internationally by affecting the parity of purchasing power and the use of an international reserve currency. For example, the governments in Germany, Japan and Switzerland in the 1970s introduced a track record of inflation which enhanced the usage of their domestic currencies beyond their borders.[12]

In this light, the value of an international currency has to be interpreted as an indicator of its stability, and consequently of the confidence that non-residents have to hold the currency. When non-residents can acquire a substantial amount of a country's liquid liabilities, their confidence raises the risks of capital inflow, which in turn affects the control of that country's

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[10] Cohen (2014).

[11] Relevant studies have been conducted by Aliber (1966), McKinnon (1969, 1979), Swoboda (1969), Bergsten (1975), Matsuyama et al. (1993), Cohen (1986), Kindleberger (1981), Kenen (1983), Frankel (1992, 1995, 1999), Eichengreen and Frankel (1996), Portes and Rey (1998), Tavlas and Ozeki (1992), and Tavlas (1993), Krugman (1984).

[12] Chinn and Frankel (2007, 2008).

domestic monetary policy and uncertainty about the course of a country's economic policy generally (Moss, 2009).[13]

Figure 1.3 Inflation, consumer prices (annual %)
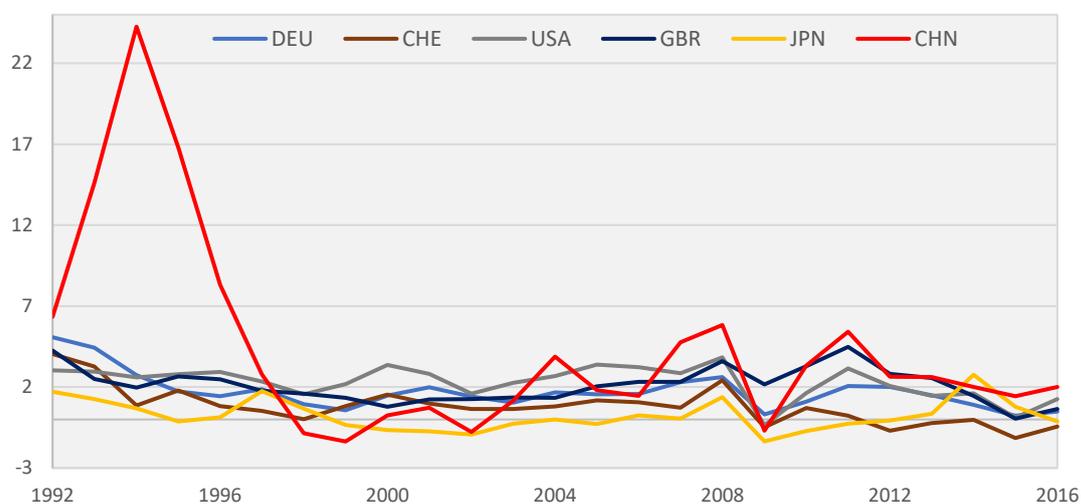
Source: Worldbank.

The risk of a currency run is now greater and the requirement to uphold the confidence of foreign investors is proportionally larger (Moss, 2009).[14] An increase of a country's inflation will depreciate the currency, and this will not only affect the stability of a currency but also its confidence. A summary of the annual inflation rate in Figure 1.3 above shows that China's inflation rate is high and volatile, while the US or UK, for instance, have a relatively stable inflation rate. Confidence in the value of the currency that it will remain stable and that it will not be monetized or inflated away is a critical factor for an international currency.(Chinn, 2008).[15]

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[13] For instance, when Germany began to gradually lift its capital controls in the 1950s, it enhanced the international usage of the Deutsche Mark until it became the second most widely used currency, after the US dollar (Yaeger, 1967). This raised major concerns for the Deutsche Bundesbank, since they had to conduct a monetary policy that accommodated both internal and external balance (Cohen, 2015).

[14] See also Franke (2004).

[15] Currency internationalisation in emerging markets predisposes the emergence of an offshore currency market and often triggers an increase in their exchange rate volatility. For instance, the exchange rate can move in response to changes from foreign shocks, that are not related to their domestic economic conditions. But the opposite can also occur: through an enlargement of a currency's foreign exchange market, an internationally held currency can contribute to an increased stability of the exchange rate. See Park and Shin (2009). Another example is the recent internationalisation of the Chinese Renminbi, in which, if foreign investors do not have trust in the policy of the PBOC, the relaxation of the Renminbi must be tested. See https://think.ing.com/articles/china-relax-rules-for-qfii-and-rqfii-outflows/#a2.

I.2.2 The financial market

Financial markets in the domestic country must be free of controls, but at the same time also be deep and well-developed (Chinn, 2008). For instance, the large financial marketplace in New York has for a long time benefited the development of the US dollar, and similarly London's financial market has long benefitted the British pound.[16] The more open and less controlled the financial market is, the greater the likelihood of a currency being used internationally.

Figure 1.4: Development of capital account openness (measured by KAOPEN index)
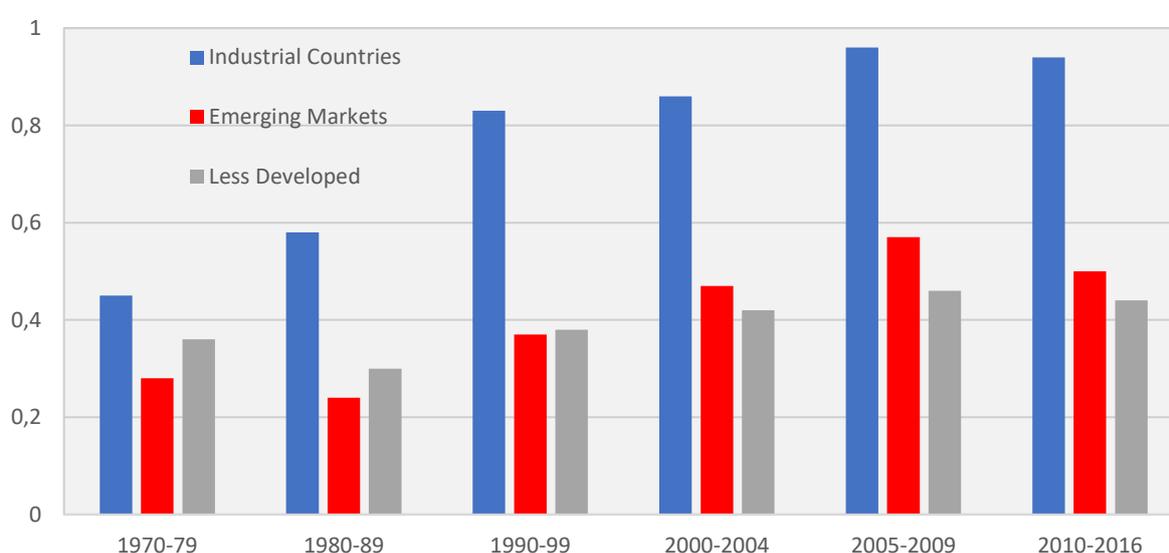
Note: The highest value of KAOPEN is indexed as 1.00.

Source: Ito and Chinn (2018).

Chinn and Ito (2007) developed a capital account openness index – KAOPEN – which attempts to measure the intensity of capital controls.[17] Figure 1.4 reflects the development of capital account openness which is measured by the KAOPEN index (Chinn and Ito, 2007). The figure shows that the world has moved towards greater financial openness among the entire group of countries, but openness declined in the period from 2010 to 2016. This might well have been the result of the global financial crisis in 2007/08. Figure 1.5 shows the development of capital account openness among developing countries for different regions. The figure reveals that

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[16] For instance, in a scenario where the UK would join the Eurozone, the Euro would benefit highly from London's deep financial market and also from the UK's economy.

[17] Chinn and Ito (2018) defined KAOPEN as built "on the dummy variables that codify the tabulation of restrictions on cross-border financial transactions reported in the IMF's Annual Report on Exchange Arrangements and Exchange Restrictions (AREAER)."

financial openness declined between 2010-16, except for Asian, Middle East and African countries. Asian countries had a high level of capital account openness prior to the Asian crisis in 1997-98. The financial openness of Eastern and Central European countries has also increased sharply over the last four decades and is almost comparable to developing countries.

Figure 1.5: Development of capital account openness among regions (measured by KAOPEN index)
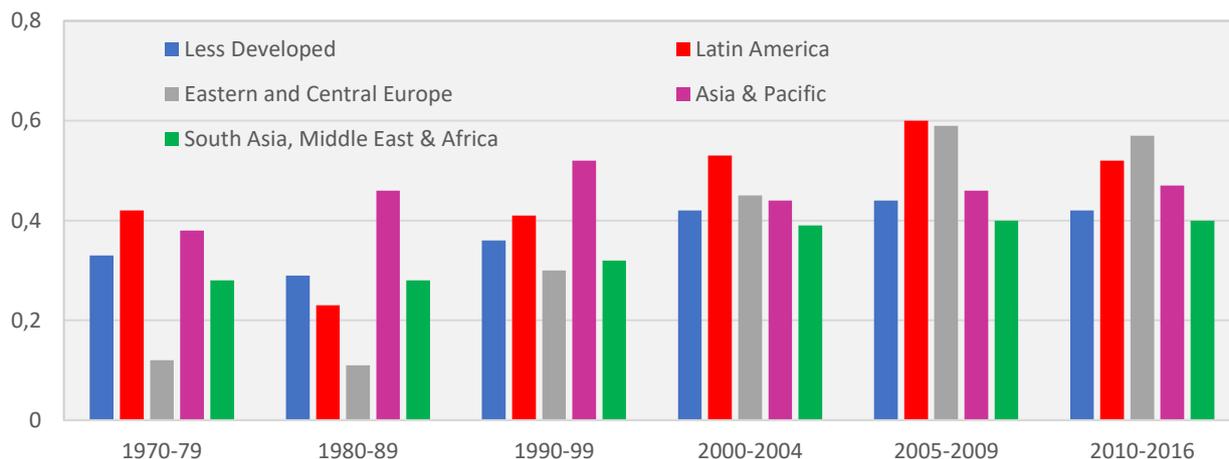
Note: The highest value of KAOPEN is indexed as 1.00.

Source: Ito and Chinn (2018).

I.2.3 Liquidity

Another criterion that promotes currency internationalisation is liquidity, since users generally hold their international money in the form of liquid, interest-bearing assets rather than currency balances. The liquidity and the size of foreign exchange markets are both very significant. Liquidity gives borrowers and investors access to a range of financial instruments from a country's real economic activity and a sovereignty's fiscal position (Chey, 2013). The larger the network, the more attractive the currency becomes, which invites in turn a greater number of people to join the network (Lim, 2006). Furthermore, a deep and liquid financial market gives countries the ability to handle outstanding financial obligations and to manage hedging of the currency and credit risks, which are required by participants in international markets.[18]

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[18] Galati and Woodridge (2008, p. 1) find that "the liquidity and breadth of euro financial markets are fast approaching those of dollar markets, and as a result the euro is eroding some of the advantages that historically supported the pre-eminence of the US dollar as a reserve currency." See also Cohen (2015).

Table 1.3 below shows the market shares for the most broadly used currencies since 1989.[19] Data has been taken from a survey of the Bank of International Settlement, and the shares shown for the Euro prior to 1999 are the sum of the French Franc, the Deutsche Mark and the old European currency unit. The Euro has emerged as a key diversification currency and developed into a currency as a store of value for both the private and official sector. But the Euro's share in international portfolios is still limited and it has not yet become a liquidity management currency (Bénassy-Quéré, 2015). In comparison, the US dollar fulfils the core functions of an international currency: it is a medium of exchange, a unit of account and a store of value at both the private and official level (Bénassy-Quéré, 2015). This currency hegemony has been maintained by the US dollar for over 60 years and it still maintains the largest share in the global foreign exchange market. The high liquidity of US dollars has pushed its international role not only in trade and investment but also as credit outside the United States. Dollar credits to non-residents grew faster than the Euro since the financial crisis in 2008, as is shown in Figure 1.6. The US dollar credit to non-bank borrowers outside the United States rose in the first quarter of 2018 by 7 per cent over the previous year and Euro credit to non-bank borrowers outside the Eurozone grew at an annual rate of 10 per cent (Aldasoro and Ehlers, 2018).[20]

Table 1.3: Currency shares of global foreign exchange market (in per cent of average daily turnover)

	1989	1992	1995	1998	2001	2004	2007	2010	2013	2017
USD	90,0	82.0	83.3	87.3	89.9	88.0	85.6	84.9	87.0	87.6
EUR	33.0	55.2	59.7	52.5	37.9	37.4	37.0	39.0	33.4	31.4
Japanese Yen	27.0	23.4	24.1	20.2	23.5	20.8	17.2	19.0	23.0	21.6
Pound Sterling	15.0	13.6	9.4	11.0	13.0	16.5	14.9	12.9	11.8	12.8
Swiss Franc	10.0	8.4	7.3	7.1	6.0	6.0	6.8	6.3	5.2	4.8

Source: Bank for International Settlements.

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[19] It is worthwhile to include here a general understanding of the terms 'key currencies' and 'vehicle currencies'. The notion of 'key currency' was first introduced by John Williams (1949) after WWII. Williams (1949) described 'key currencies' as 'principal currencies' and the single true 'international currencies' to be a synonym for international money in general (Cohen, 1971). Williams also used the term 'key currencies' for those that were 'central for an area for trade', also including within this category the function of the currency as a reserve currency too. A couple of years later, Robert Roosa (1965) distinguished between 'reserve currencies' and 'vehicle currencies'. In his taxonomy, 'reserve currencies' were those that are held by governments (or international institutions) as their foreign exchange reserves. Roosa (1965) described 'vehicle currencies' as internationally accepted and widely used by both investors and private traders. Swoboda (1969) added that "a vehicle currency in the foreign exchange market is a foreign currency: (1) in which dealers hold significant working balances; (2) in which they take temporary positions and (3) through which one non-vehicle currency is exchanged for another. A vehicle currency is more than a means of exchange. Nevertheless, general acceptability in the settlement of foreign exchange transactions is probably a vehicle currency's most important attribute."

[20] See the Figure in Appendix I.A and Appendix I.B for US dollar and Euro credit to developing countries.

Figure 1.6: US dollar and euro credits to non-residents (in percentage)
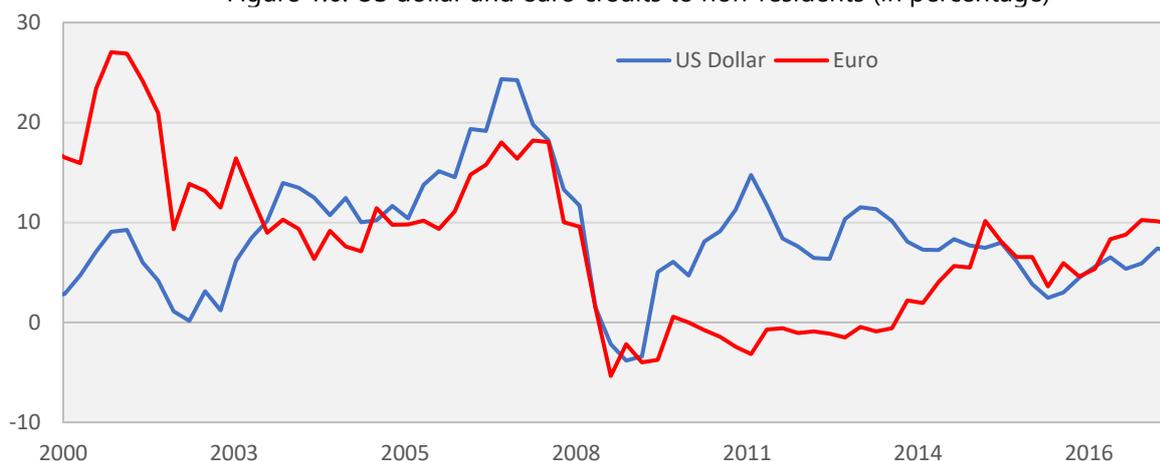
Source: Bank for International Settlements.

It is essential for an international currency to have a deep and liquid financial market, especially when it comes to government bonds, in which there are many buyers and sellers. This will support its being held outside its borders (Prasad and Ye, 2013).

I.2.4 Network externalities

Currencies frequently attract growth when they become accepted beyond their borders. The economies of scale dictate that the most attractive currency will come to circulate almost universally as a transaction currency. For example, the rise of the sterling in the nineteenth century emerged as a result of its important role in world trade, and the same goes with the rise of the US dollar in the early twentieth century. The growth of financial transactions and the associated market liquidity, together with stability, pushed the use of both currencies internationally.[21] Hence, non-residents are more likely to use a currency in their transaction when *everybody else* is also using the same currency. The development of network externalities can also be shown through highlighting a currency's function as an international investment currency. Therefore, Table 1.4 provides a summary of investment currency shares of the global banking market, including all cross-border banking claims. There are some trends to notice, particularly the large decline of the Euro and the 4.5 per cent rise of the US dollar. After the Global Financial Crisis in 2007 the US dollar currency share began to rise and in 2017 it

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[21] See Cohen (1971).

reached the pre-crisis currency share. Overall, for (almost) the last three decades, the US dollar has been able to gain ground, while the Euro has lost shares.

Table 1.4: Currency shares in international banking (in percentage)

	1989	1992	1995	1998	2001	2004	2007	2010	2013	2017
USD	58.4	52.3	45.0	48.5	48.4	48.0	41.9	42.7	44.3	48.8
EUR	17.4	22.8	27.5	26.0	31.8	39.1	39.6	39.4	36.5	28.9
Japanese Yen	13.8	12.3	14.1	10.0	8.1	4.9	3.4	3.7	4.5	5.7
Pound Sterling	3.5	3.9	3.5	5.0	5.0	6.4	7.7	5.7	4.8	4.5
Swiss Franc	4.1	4.3	3.9	2.9	2.3	1.8	1.6	1.5	1.6	1.7

Source: Bank for International Settlements.

Moreover, if a currency is used for trade invoicing, then it is also likely to become more widely used for financial transactions. For instance, because the dollar (and, in the nineteenth century, the sterling) is the most widely used currency for transactional purposes, it has also become the currency that is held for asset purposes. Another advantage of the US dollar is its reasonably attractive interest rate level, which gives other the advantages of exchange convenience and capital certainty.[22] The transaction attractiveness of a currency tends to correlate highly with exchange convenience.

I.2.5 Large Economic Size

International currencies are associated with large and competitive economies, especially those that have a large share in international output trade and finance. The U.S.A is still the world's largest economy in terms of output and trade and has 25 per cent of the world's gross product.[23] China is now the world's third largest economy in terms of GDP based on PPP, its largest merchandise export, and the second largest force in merchandise imports. A large market size is likely to result in lower transaction costs, which is the reason why vehicle currencies belong to large and dominant economies. Most of the smaller economies cannot offer an efficient and competitive market in foreign exchange (Lim, 2006). Figure 1.7 presents the largest economies by nominal GDP. The US ranks in first place, followed by the Euro and Japan.

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[22] See Pesek and Saving (1967), Swoboda (1969).
[23] See Bergsten (1997) and Mundell (1998), who both stressed the importance of large and competitive economics for an international currency. Such an economy is able to generate a large market for foreign exchange transactions and also financial ties. The reason is thus that large markets will likely to have low transaction costs.

Figure 1.7: Largest economies by nominal GDP
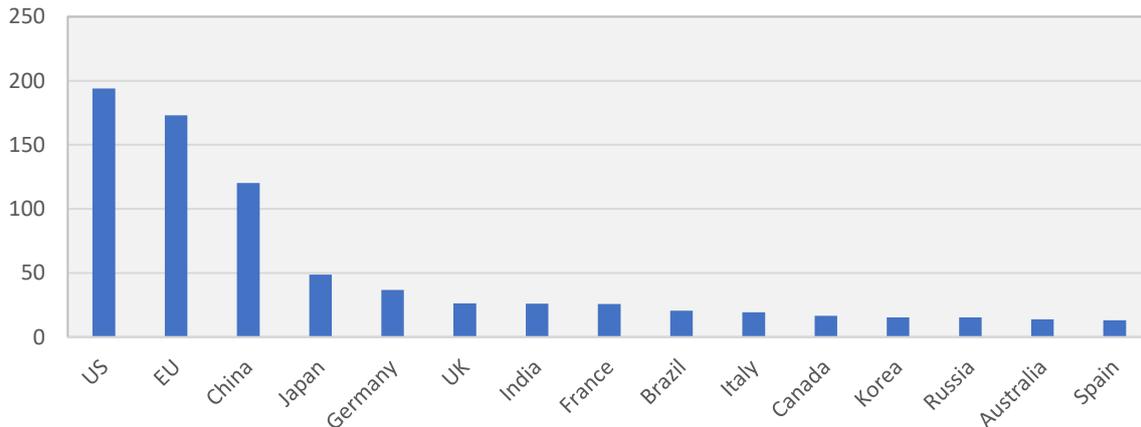
Source: World Economic Outlook Database.

These various factors represent a diverse body of literature which dates back decades and which focuses on the economic analysis of what determines an international currency. The most important factors seem to be a currency's stability, its financial development, network externalities, and its economic size. Factors such as economic size promote the medium of exchange function, while financial development has its biggest impact on the store of value function. Political relations will play an influential role at the official level and can offer a safety for private investors and central banks. No single factor is decisive on its own and the prospect of becoming a global currency also depends on how many rival currencies there are.

I.3 Power and International Currencies

Power has always been an elusive subject for analysts of international politics. Countries with the most military power have been viewed as controlling world affairs. However, the resources and the path that produce the capabilities of power have become diverse. Power in economics is a complex component which reflects not only the nature of international relations but also their political consequences. Strange (1996), for example, has assembled an all-inclusive definition, that "power is simply the ability of a person or a group of persons to affect outcomes that their preferences take precedence over the preferences of other".[24] There is a wide body of literature on the most appropriate economic milieu for currency internationalisation, yet the significance of political factors has been noted but rarely discussed.

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[24] In addition to Strange (1996), see also Kennedy (1987) and Keohane and Nye (1998).

By looking to international reserves, military expenditure and the role of International Financial Institutions, the purpose of this section is to map out in a rough and tentative way the political theory behind global currencies.

I believe that international currencies cannot be analysed without analysing a country's political and military power. The economist Robert Mundell (1993) noted that "great powers have great currencies" and thereby directly connected political power and currency internationalisation. Helleiner (2008) elucidates the direct framework in which politics are important for master and negotiated currencies. Master currencies have power over countries, while a negotiated currency reflects a more reciprocal, or non-hierarchical, relationship between the issuing and foreign states that affects its use internationally.

The development of the sterling area reflects Britain's role as an international economic power. The nineteenth century gold standard was a sterling exchange standard, due to its pre-eminent role in trade and finance. After 1918 Britain's economic and financial capabilities faltered, so the sterling's role in the international economy began to decline. To finance the First World War, the British government accumulated a high amount of debt, having later to borrow from the US, after which the British pound began to depreciate against the dollar. Britain was unwilling to accept this economic decline and resolved the problem by returning the pound to its pre-war value during the gold standard. An ongoing depression affected Great Britain's economy and caused a trade deficit which inevitably caused gold outflows. Hence, Britain was never able to rebuild the lost gold reserves in World War I and was running out of gold. By the beginning of World War II, the British Empire was slightly declining but still covered a quarter of the globe. Great Britain won World War II but lost the empire, and with the shrinking of the empire the role of the British pound as an international currency began to decline and the sterling area diminished.

This had left the scene free for the emergence of a new global power. Two countries stepped forward to develop competing blocs, namely the United States, who was the great victor of the war, and the Soviet Union, which produced the bipolar system. However, even countries which were implacably opposed to the United States and which grouped around the Soviet bloc also had balances in the United States.[25]

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[25] Countries that blocked around the Soviet Union included Eastern European Countries, China, Cuba, North Vietnam, and North Korea. The U.S.S.R. itself had balances in the United States. See Bergsten (1975).

The fear of overt political hostility had jeopardized the safety of the Soviet dollar assets held in the United States. The hostility between major countries created an alliance system and an intra-alliance hegemony.[26] These systems boosted the possibility that dependent allies will accept economic and financial power through allowing themselves to be politically and militarily dominated. Thus, when a country has power, allies foreign governments see it as being in their geopolitical interest to use their currency for cross-border transactions (Eichengreen, 2018). For instance, major countries such as Germany and Japan, that were holding dollars, were driven by their political and military dependence on the United States.[27] The military expenditure by the United States generated the balance of payment deficit, which is essential for the process of currency internationalisation.[28] Moreover, intra-alliance hegemonies usually want to support the economies of, and give security to, their allies, which subsequently enhances their domestic currency power to develop internationally. Therefore, strong allied economies play an essential role in establishing an environment for a key currency to emerge and develop.

I.3.1 International Reserves

Eichengreen et al. (2017) have, for example, recently studied the geopolitical foundation of the US and analysed the way that their security alliances and 'dollar diplomacy' contributes to the high shares of US dollars that compose international reserves.[29] For instance, the bilateral

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[26] A hegemonic power has been defined by economists as the dominance held by one country which is required for a smooth functioning of an international regime. There are general features of hegemonic power: a commanding international currency, a leading military position with alliances worldwide, the status of being a leader during crises and conflicts, and usually holding onto one's nuclear arms (Uzgel (2003)). Nye (1990, 2002, 2008) developed the term 'soft power' and lists additional sources of hegemonic power, such as technological leadership, supremacy in the military and economy, and control over the connection points of international communication lines. He states that 'soft power' is a directing, attracting and imitating force that is derived from intangible resources like culture and the country's influence on international institutions.
The "theory of hegemonic stability" coined by Keohane (1980) posits that "hegemonic structures of power, dominated by a single [power], are most conducive to the development of strong international regimes whose rules are relatively precise and well obeyed" (p. 132). See also Gilpin (1975, 1981), Krasner (1976), and Stein (1984). For instance, the classical gold standard is ascribed to Britain's dominance in the second half of the nineteenth century or the single power of the United States after World War II. By contrast, the interwar gold exchange occurred during the absenteeism of a hegemonic power, since Britain and the United States were unable to play the dominant role. See also Bergsten (1975).
[27] See also Eichengreen (2017).
[28] The French Minister Valéry Giscard coined the phrase "exorbitant privilege" to describe the USA's ability to run balance of payment deficits by printing more US dollars. See also Cohen (1971), Salant (1964), Eichengreen (2011).
[29] Eichengreen et al. (2017) analysed the role of the economy and security in the currency composition of international reserves. They contrasted the Mercury and Mars hypothesis. The Mercury hypothesis described the

relationship of the Kingdom of Saudi Arabia explains why it holds reserves mainly in US dollars, while Russia, who is also an oil exporter, does not. Germany is another example, who hold most of its reserves in dollars, whereas France, conversely, does not. By the same token, Saudi Arabia, Germany, Japan, and South Korea all depend on US for security Eichengreen et al. (2017).

Figure 1.8: Share of the US dollar in the foreign reserves of selected countries

US dollar share in FX reserves (%)
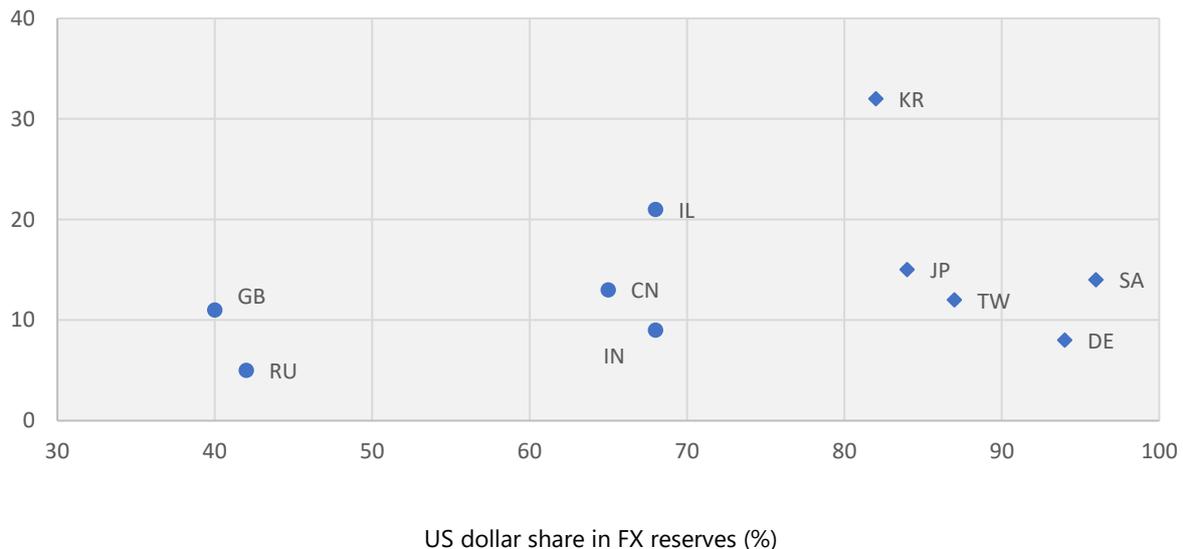
Note: GB: United Kingdom (estimate for 2004); RU: Russia (estimate for 2016); CN: China (estimate for 2008); IL: Israel (estimate for 2015); IN: India (estimate for 2015); JP: Japan (estimate for 2006); KR: Korea (estimate for 1987); TW: Taiwan (estimate for 2016); SA: Saudi Arabia (approximate estimate for 2016); DE: Germany (estimate for 2004).

Source: Eichengreen et al. (2017).

The diamond-formed dots in Figure 1.8 . denote US-dependent states, while the round dots present the foreign exchange reserves of nuclear-weapon countries.[30] It is noticeable that five countries, which are all allies of the US as well as non-nuclear weapon countries (Germany, Korea, Japan, Saudi Arabia, and Taiwan), have the highest share of reserves in US dollars, and these countries also highly depend on the US for security guarantees (Eichengreen et al, 2017). Figure 1.8 demonstrates that there is a connection between the decision in which currency to hold reserves and geopolitical alliances and security guarantees (Eichengreen et al., 2017).

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choice for holding a currency as being based on well-known factors, such as large economic size, stability, etc. The Mars hypothesis, conversely, hinges on geopolitical factors.
[30] The Figure advocates that the share of US dollar in foreign reserve holdings is in the order of 35 percent Eichengreen et al. (2017).

Hence, the diplomatic and military power of the US has encouraged allies to hold reserves in US dollars, which consequently pushes its role as an international reserve currency.

The economic development of one's allies includes the accumulation of foreign reserves and often allows the dominant power a major economic advantage by offering to their allies their currency. Hence, for a key currency the management of the monetary system is another political criterion. In summary, political and military dominance support economic and financial supremacy and consequently promotes for the development of a key currency (Andrews, 2006).

I.3.2 Military expenditure

In this section I will proceed to assess if there is a correlation between military expenditure and the global role of the currency. The growth of the US after World War II was pushed not only by the growth of private US trade and investment abroad but also by military spending. These actions helped to build an international network for the dollar and can be seen as a secondary channel in building confidence and liquidity. For instance, Ayanian (1987) showed in his study the correlation between the increase of US military spending and the increase of foreign demand for dollar-denominated assets and the appreciation of the US dollar in the period 1973-85. Ayanian also concluded that the defence expenditure was driving the US dollar, and with an increase in the US defence budget share, it has increased 'safe haven' demands for the US dollar assets. The reason was, the rise of military capability and resolve for foreign investors in a threatened world (Ayanian, 1989).[31] A similar conclusion has been found by Grilli and Beltratti (1987), who studied the relationship between the Mark-Dollar real exchange rate and the level of US military expenditure for the time frame 1951-86 and found a significant relationship.

Military spending contributes to the various dimensions of international security: namely, the military, the political and the economic (Deger and Sen, 1990). Since the dominant military power of the United States has boosted the dollar's international role, it is interesting to see if there is a causal relationship between military expenditure and the global status of an

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[31] Aynian (1989) studied the dollar exchange rate of 11 industrialised countries to US military expenditure of GNP and found a positive correlation. He further stated that the "quantitative magnitude of this relation will be directly related to a nation's relative threat of Soviet invasion".

international currency. Figure 1.9 presents the military spending in percentage of GDP of six countries:

Figure 1.9: Military expenditure (percentage of GDP)
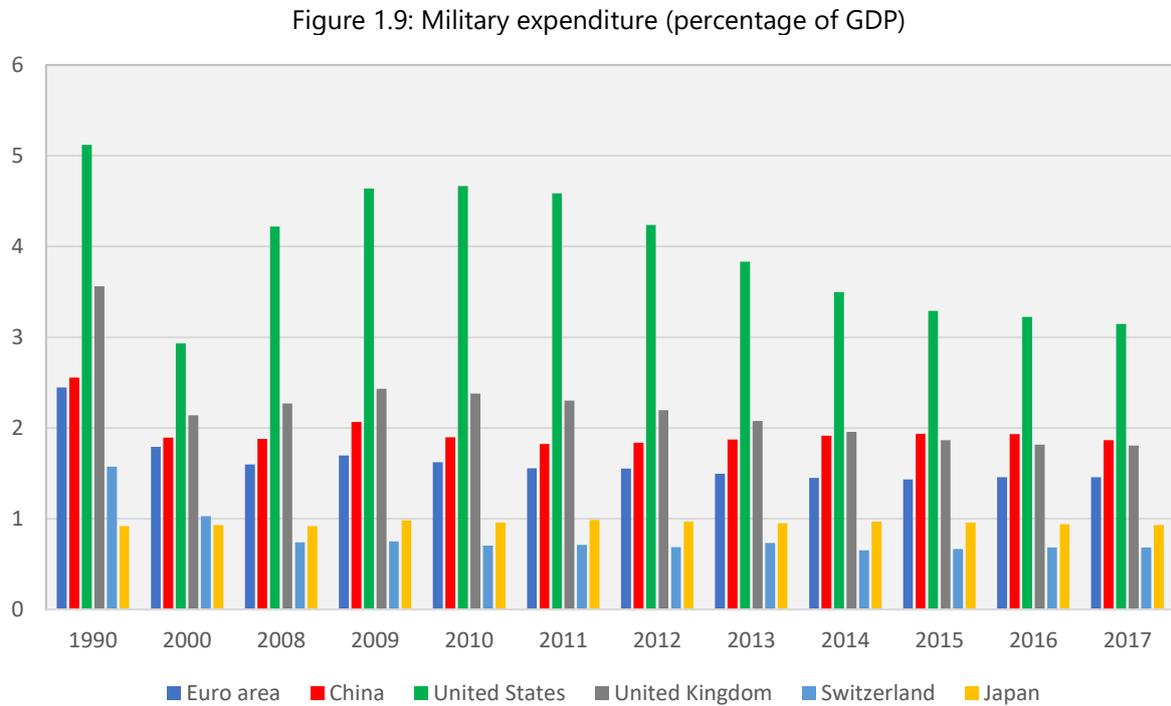
Source: Worldbank.

Figure 1.9 shows that the US military spending in percentage of GDP is the highest, followed by the United Kingdom but only until 2014. China has barely increased its military spending, but the decline of United Kingdom's military spending has put China in the position of being the country with the second highest military spending in percentage of GDP, nevertheless still with a large gap to the United States. Figure 1.9 also shows that the military spending within the Eurozone has declined since 2009. Comparing this figure to Table 1.3 (the market shares of vehicle currencies) and Table 1.4 (currency shares of international banking), it is visible that there is a decline not only in military expenditure but also in the general usage of the Euro in the last 15 years.

For a series of reasons, the question whether there is a correlation between military expenditure and the international demand of a currency cannot be fully answered with reference to Figure 1.9 alone. For instance, short- or medium-term fluctuations of military spending would not reflect the international usage of a currency and it will certainly not reduce the key status of the US dollar. Indeed, there has not been an international currency without the high military expenditure of a country. If we look at Table 1.5, we can see that Saudi Arabia, Russia and

India have high military expenditure, but their currency does not have a regional nor international role, since they do not fulfil the main requirements for a vehicle currency. All in all, military expenditure might not be the key to an international currency, but it helps to explain the status of an international currency.

Table 1.5: Military expenditure

Rank 2017	Rank 2016	Country	Spending 2017 ($b.)	World share 2017 (%)	Spending as a share of GDP (%)
1	1	USA	610	35	3.1
2	2	China	[228]	[13]	[1.9]
3	3	Saudi Arabia	[69.4]	[4.0]	[10]
4	4	Russia	66.3	3.8	4.3
5	5	India	63.9	3.7	2.5
6	6	France	57.8	3.3	2.3
7	7	UK	47.2	2.7	1.8
8	8	Japan	45.4	2.6	0.9
9	9	Germany	44.3	2.5	1.2
10	10	South Korea	39.2	2.3	2.6
11	13	Brazil	29.3	1.7	1.4

Source: Stockholm International Peace Research Institute.

I.3.3 International Financial Institutions

The exercising of power or influence of one country over another country can be effected through different networks and systems, such as International Financial Institutions (IFIs). To pursue their foreign policy objectives, there is growing evidence that powerful countries like the US use IFIs. The *de jure* goal of IFIs is to foster economic development for low and middle-income countries. Prominent examples of IFIs are the World Bank, the Asian Development Bank or the International Monetary Fund. IFIs play a significant role in supporting the private sector in developing countries to achieve sustainable growth and development though poverty reduction policies. But this is only half of the tale.

Several case studies have addressed the influence of the US and other influential countries within the IMF and World Bank.[32] One reason is, for instance, the votes of United Nations

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[32] For instance, Killick (1998) stated that during the 1980s the US used its influence within the IMF to put pressure on Argentina to accept more funds from them. An empirical study conducted by Dreher et al. (2008) analysed whether members of the United Nations Security Council (UNSC) have a favourable treatment from the IMF in forms of loans. Although it is unclear whether the members of the UNSC take the initiative and ask for loans or if the IMF approaches them, the study concluded that IMF loans has been used as a tool by which major shareholders of the IMF (usually the US but also Germany, UK and France) win the favour of voting members of the UNSC.

Security Council members. Actually, the IMF and the United Nations Security Council (UNSC) are two independent institutions. But the most powerful countries in the world care and need UNSC member votes to pursue their political goals.

Figure 1.10.: Bilateral aid from 1960-2009 (in millions of US dollar)[1]
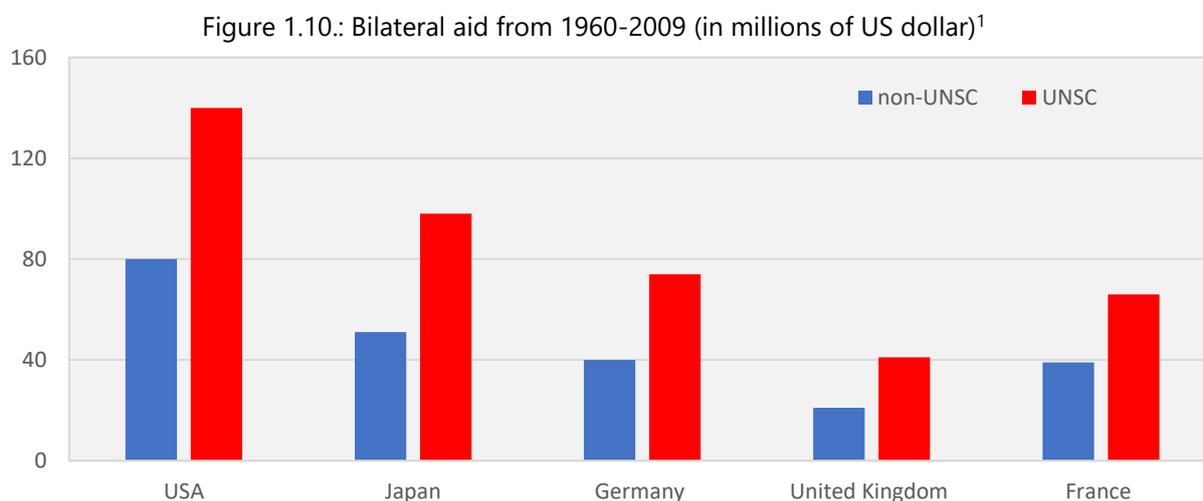
[1] Non-UNSC: n=5719; UNSC: n=339.

Source: Vreeland and Dreher (2014).

Figure 1.10 shows that, among the powerful countries, aid for UNSC members is much higher than for non-UNSC members. Kuziemko and Werker (2006) found out that US aid increases by 59 per cent and U.N. aid by 8 per cent when it rotates on the council.[33]

In 1991, Zimbabwe was serving its term in the United Nations Security Council. At that time Zimbabwe did not support the U.S foreign policy on Iraq and voted against the US-supported resolution on the repression of Kurds in Iraq (Vreeland and Dreher, 2014).[34] But in 1992, Zimbabwe had entered an IMF negotiation over a potential loan which guaranteed regular disbursement. The influence and power of the United States over the IMF must have been well-known to Zimbabwe. Suddenly, the Zimbabwe government choosed to support the UN resolution regarding the demarcation of the Iraq-Kuwait border and the continuing sales of Iraq oil. The reason for this sudden shift was a threat by the IMF with increased conditionality if they vote against US efforts.[35]

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[33] See also Dreher et al. (2006) who stated that UNSC members are more likely to receive IMF assistance. Different empirical studies also show the political imperative within the World Bank. See for instance Frey and Schneider (1986), Dreher and Sturm (2006) and Andersen et al. (2006). Another study by Kilby (2002) analyses the influence of Japan and the United States on the Asian Development Bank. They found greater and consistent influence of Japanese rather than US influence.

[34] Resolution 688; April 5, 1991.

[35] Another interesting study has been conducted by Broz and Hawes (2006) who considered the preferences of politicians within the US as the main influencer at the IMF. They analysed US congressional votes for an increase

This episode is part of a growing body of evidence which shows that members of the UNSC receive loans from the IMF if they vote with the dominant shareholder, e.g. the US (Vreeland and Dreher, 2014).[36]

The table in Appendix I.C is a summary of IMF total fund credit for African countries between 1967 and 1996. Interestingly the four countries of Gabon, Kenya, Cameroon and Algeria received IMF funds during their time as an elected member of the UNSC.[37] The highlighted cells in the table also show that some countries, e.g. Uganda, Zimbabwe or Niger, received during their term much more funding than they did outside their term. Although these conclusions have to be treated with caution, in some way they underlie the hypothesis that IMF funding is driven by UNSC membership.[38] Moreover, an empirical study conducted by Oatley and Yackee (2004) analysed the US influence on IMF conditionality agreements and found out that American policymakers outline the specific content of IMF conditionality agreements. They also stated that if the US has its own interest, then larger loans by the IMF are offered.[39]

A multidirectional feature of power is influence which gives the superior power the capability of reaching their goals, while on the other side the subordinated countries profit from this relationship. For instance, the sponsored bailouts by the IMF provide different conditionality agreements for countries that urgently need loans. Countries like Greece receive smoother and lighter conditions, since they are more tightly connected to major shareholders at the IMF who virtually run the institution, than countries like Indonesia or Thailand, who might be less important to them (Dreher et al., 2013).[40]

The example of effecting power on IFIs shows that the United States is still the most powerful country in terms of aid across the world, followed by Germany, France and the UK. However, China understood this pattern and is determined to exercise economic power to become a

in IMF quota for 1983 and 1998. They found that US representatives in Congress voted in favour of an increase, which would also beneficial for their international banking campaign contributors (e.g. Citibank, Bank of America etc.) Hence, these banks have loans and investments in developing countries and they strongly support the IMF. An IMF bailout guarantees that these countries can pay their debts back. They concluded that the reason that the United States fund the IMF is primarily for their private actors, as they have individual shares in funding the IMF.
[36] Cuba left the IMF in 1964 and claimed that the IMF was an institution of the US. From 1990 to 1991 Cuba was a member of the UNSC and was opposing Iraq resolutions, and unfortunately they did not receive any IMF financial aid. Oatley and Yackee (2004) also stated that the amount of US banks' lending in developing countries depends on the amount of IMF funding.
[37] See yellow highlights.
[38] See also Kuziemko and Werner (2006) and Dreher et al. (2006).
[39] The General Accounting Office (2001) stated that US Congress passed not less than 60 legislative mandates which required American representatives at the IMF to shape conditionality agreements in order to achieve US interest. See also this Reuters article by Drazen (2018) available at https://www.ft.com/content/b8e010ea-54b1-11e6-befd-2fc0c26b3c60.
[40] See also Desai and Vreeland (2010).

leading member of the global community. Their international strategy includes the increasing influence in the present multilateral institutions. China's voting share at the IMF had been lately increased from 3.8 per cent to 6 per cent, which is the same share that Japan has. At the ADB and the World Bank China has voting shares of 6 per cent and 5 per cent. China took also further steps and began to show presence at the African Development Bank and Caribbean Development Bank (Prasad, 2017).

I.4 Theories of Monetary Power

In the early 1960s the United States exercised their fundamental economic power, along with their military and political influence, to change the rules of the international monetary system, and this has rewarded the United States with monetary power.

The international monetary capability of a single country is a function of their economic and political power. The exercising of monetary power (also called "currency power" and "key currencies") is a major feature of international monetary relations and consists of a range of different elements. For example, a country's international monetary relation can lead to international monetary power which has been defined as a relational property, meaning that it comes about "when one state's behaviour changes because of its monetary relationship with another state".[41]

A general definition of monetary power has been given by Cohen (2006), who defined the core foundation of monetary power through the *autonomy* and *influence* of a state. He states that *autonomy* constitutes a state's ability not to be influenced or impacted by other countries. For instance, the United States is a country with monetary power, since it carries out an independent monetary policy, something which is also termed as the *internal factor*.[42] As for the second part, Cohen (2006) defines *influence* as the outcome of events and their external consequences.

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[41] Andrews (2006). One example of dependence in the term of monetary power involves the creation of currency blocs "areas" or "zones", where the power belongs to one leading country, for instance Britain, France or Germany. The countries within the monetary bloc are usually vulnerable. During a time of depression in the 1930s, Germany was economically in a powerful position. The German authorities used their power and targeted southern and eastern European countries and exercised dependence through the manipulation of exchange control policies, particularly bilateral exchange clearing (Kirshner, 1995). A more up-to-date example is China's increasing monetary influence in Africa. China's growing trade and investment has elevated the role of the Chinese Renminbi as a reserve currency in Africa. Furthermore, China signed several currency swap agreements with African countries, e.g. Nigeria, of 2.4 billion US dollars. The growing amount of Chinese loans to African countries will increase the interdependence and might also loosen the ties of US dollar dependency.

[42] There is a large body of literature regarding the current status of the US dollar and its probable future decline.

This means that a country can often be powerful enough to the degree where they can influence and pressurise other countries outside their borders. The manipulation of monetary relations to influence the policy of states is a feature of monetary statecraft. Monetary power and monetary governance are crucial factors for understanding the nature of international monetary relations in a globalized economy. There are different ways to exercise monetary power which Kirshner has listed in three ways: (I) Currency manipulation, (II) Monetary dependency and (III) Systematic disruption.

First, currency manipulation occurs when the authorities decide to purchase or sell foreign currency in order to drive the exchange rate of its domestic currency away from its equilibrium rate, or otherwise to avert the exchange rate from moving to its equilibrium rate. Over a long-term period, the equilibrium value of a currency counts as the sustainable factor: an exchange rate is sustainable if the current account balance is not producing massive changes for the foreign assets relative to both stocks of domestic and foreign wealth (Gagnon, 2012).[43] One significant advantage of currency manipulation is its wide degree of flexibility, since it can be used with different degrees of intensity and does not need the involvement of another state. The theory of currency manipulation also differs with respect to the *positive* and *negative* forms of currency manipulation (see Table 1.6 below).[44] The positive form of currency manipulation is a protective manipulation, which aims to move the exchange rate position of the target state and which needs the intervention from the domestic authority. In its simplest form, this requires the purchase of the target's state domestic currency on the open market.

Table 1.6 The Four Basic Forms of Currency Manipulation

	Motive	
Technique	Positive	Negative
Intervention	Protective	Predatory
Disengagement	Permissive	Reserve

Source: Kirshner (1995).

Kirshner further stated that protective currency manipulation involves all action to push the target currency in order to reach their currency goals. The method of permissive currency

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[43] The issue of currency manipulation has been approached differently by the World Trade Organization (WTO) and the International Monetary Fund (IMF). The IMF Articles of Agreement prohibit countries from manipulating their currency in order to gain an unfair trade advantage (Sanford, 2011). The IMF cannot force a country to shift its exchange rate policies. The WTO has certain laws against subsidies, but they do not seem to encompass currency manipulation (Sanford, 2011). See the further discussions about the equilibrium of exchange rate in Cline and Williamson (2011) and Lee et al. (2008). Other essays about currency manipulation of the Chinese Renminbi can be found in Mercurio and Leung (2009) and Staiger and Sykes (2010).
[44] Kirshner (1995).

manipulation occurs when a country decides to deliberately not take certain actions in order to prevent a harmful outcome for the country of interest. For instance, it can choose instead to tolerate the actions of the country of interest in currency manipulation.[45] An undervaluation can also be beneficial for trading, e.g. exports. During World War I large outflows of gold to the United States put pressure upon the British pound, and to prevent a currency depreciation against the US dollar Britain intervened in the New York market. This British interference of currency manipulation was an act of self-protection for the sake of its own currency (Kirshner, 1995).[46]

Kirshner (1995) further defined the two negative forms of currency manipulation as predatory and passive manipulation, which together refer to different schemes by which to punish the target country.[47] In order to weaken the currency position of a target country, a form of predatory currency manipulation has to be adopted. An example of this would be the dumping of the target currency on the international market. However, predatory currency manipulation can also occur through rumours, in order to enhance a run on a currency that is perceived to be weak.

The second form of exhibiting monetary power has been defined by Kirshner (1995) as 'monetary dependence'.[48] Monetary dependence is by definition a continuing condition of incomplete freedom in policy choice and action. It is assumed to be an outcome of specific configurations of economic, socio-political and institutional factors.[49] Monetary dependence reflects the whole structure of a nation's monetary, trade and financial transactions, as well as its monetary relationship with dominant countries.[50] This form of power is employed by the

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[45] 'Currency dumping' takes place when a lower price on foreign markets occurs due to an exchange rate. For further discussion of currency dumping, see Kindleberger (1970), Dickey (1981), Raafat and Salehizadeh (1994), as well as the following article: https://www.reuters.com/article/us-markets-franc/swiss-franc-jumps-30-percent-after-swiss-national-bank-dumps-euro-ceiling-idUSKBN0KO16Y20150115.

[46] Another example of positive currency manipulation is China and other developing countries, which are purposely depreciating their currencies to push exports. This manoeuvre has enabled them to be larger and faster than they would otherwise have been. China's currency manipulation is also beneficial to their trade partners, since cheaper imports which raises consumer welfare.

[47] A negative form of currency manipulation can be seen in the case of China, whose economy was overheating in 2007 and caused an inflation of 5 per cent with a GDP growth of 14 per cent. At this point an appreciation of the Chinese Renminbi would have calmed the Chinese economy.

[48] The 'dependency theory' mirrors the perpetually subordinated role that is played by poor, undiversified economies, which are oriented towards serving and relying upon the world's capital system that they face. Dependency scholars share the view that poor economies are degraded to a semi-permanent condition of underdevelopment. This leaves poor countries "vulnerable" in their economic transactions with rich countries. For further discussion of dependence, see Katzenstein (1975), Deutsch et al. (1967).

[49] See Dixon-Fyle (1978). For the history and theory on dependency, see also Bath (1976).

[50] Hirschman (1945) pioneered the term of dependence in economics. He developed a scheme of trade dominance by major powers and conducted an empirical study in Nazi Germany's penetration into Eastern European countries. In particular, he differentiated two functions that foreign trade might serve. First, trade has a "supply

domestic country to compel and perpetuate its economic domination towards vulnerable countries. Vulnerable countries are usually economically and financially dependent upon developed countries, and monetary dependence is self-perpetuating.[51] For example, Dixon-Fyle (1978) analysed African monetary dependence on foreign currencies and their consequences for autonomous decisions regarding monetary policy. In his case-study about Sierra Leone, Dixon-Fyle explained that monetary dependence is visible in the inflation rate and in the international competitiveness that exists between countries, and that it is important for Sierra Leone's foreign trade and finance. Dixon-Fylefurther stated that "although virtually the entire Third World, and perhaps even the majority of developed countries, face problems of this kind, and could thus be said to be variously monetarily dependent, the nature and continuing dependence of African countries raises interesting questions peculiar to them".[52]

Monetary dependence has been manifested in the past through currency zones like the British sterling, French Franc, the US dollar or the Euro today. These currency zones can aid insulation and the potential for the mobilization and coordination of resources (Kirshner, 1995). Another contemporary example is Pakistan's growing dependence on China. Besides the ongoing infrastructure project of 6 billion US dollars to connect Eurasia's and China's trading networks, China has loaned more than 5 billion US dollar to Pakistan in the period 2017-18 for the sake of the country's economic stability.[53] The final form of currency exercising described by Kirshner is a distinct form of monetary power, namely systemic disruption. On Kirshner's definition, this "refers to attempts to exercise monetary power that are directed at specific international monetary systems or subsystems, as opposed to particular currencies".[54] This form of power describes the threat of monetary arrangements which aims to damage the system

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effect", which connotes the sale of exports paid in exchange for the imports of goods from other countries. Second, the "power effect" of trade, which Hirschman explained as the power to interrupt commercial and financial relations with any country, was examined as an attribute of national sovereignty and was shown to lie at the roots of a country's power position which is acquired in other countries. This is also the root cause of 'trade dependency'. Hence, the latent blockage attending the "supply effect" creates the path for a "power effect". Moreover, Hirschman used the example of country A's decision to interrupt trade with country B, which would have negative supply effects for both countries. However, after this initial eventuality, country A can simply use threats of interruption as a political weapon and if country B suffers more, then the "supply effect" creates the opportunity of a "power effect". This can only take place if country A is dominant over country B and if country B relies on country A, as it is difficult to switch the trade away to alternative countries. For more on this concept, see the discussions in Galtung (1966), Richardson (1978).

[51] After the move of the U.S. embassy in Israel from Tel Aviv to Jerusalem in May 2018, Guatemala moved its embassy there too. Guatemala is a country which is financially highly dependent upon the U.S. See Heller and William: https://www.reuters.com/article/us-israel-palestinians-guatemala/guatemala-opens-embassy-in-jerusalem-two-days-after-u-s-move-idUSKCN1IH0Q7.

[52] Dixon-Fyle (1978), p. 276.

[53] See further: https://www.scmp.com/week-asia/geopolitics/article/2153614/pakistans-currency-crisis-china-problem-and-solution.

[54] Kirshner (1995), p. 8.

or to obtain some benefit from it. According to Kirshner, there are two forms of disruption: strategic and subversive disruption. Strategic disruption describes a form of coercion, which seeks to extend the ability of a country to undermine the system and so make off it tangible gains without damaging the monetary regime. On the other hand, systematic disruption is most likely to be conducted by medium-sized countries, who have sufficient power but do not play a dominant part in the international monetary system. Successful disruption has the consequence that the leader of the system loses all the political benefits, and member states would also bear the economic costs.

I.5 Conclusion

An international monetary role can occasionally put the issuing country in a position where their decision will impact other members. For example, countries who have an anchoring role have the power to manage the exchange rate which will be transported to others. Within a monetary system, small member countries provide little to the system, but gain stability, protection, trade access, and much more. For instance, the stability of Germany's currency, the Deutsche Mark, encouraged European countries to adopt the Deutsche Mark as an anchor currency. An extreme case is the hyperinflation of the Yugoslavian dinar in the early 1990s. During that time, Yugoslavian business partners refused the Dinar and conducted their transactions exclusively in Deutsche Mark, which became the unofficial currency of Yugoslavia. Another pair of examples are Ecuador and El Salvador: to enforce strict fiscal discipline and to prevent speculative attacks and economic crises, these countries adopted the US dollar as their own currency and thereby turned monetary policy to the US Federal Reserve. All these small countries are much less likely to leave the currency area.

For countries that exercise monetary power, it is important to understand the outcome of their actions towards their allies who depend on them. For instance, the plan for currency internationalisation of the Chinese Renminbi has become hampered over the last two years. The Chinese government is less likely to pursue financial liberalization if the process threatens their internal financial stability and other countries within Asia. They might just lift capital controls in an asymmetric way over the coming years by relaxing restrictions on capital inflow, but whilst keeping the restrictions on capital outflow. China's desire to establish an international currency is not enough and there are limits to the process, imposed for instance through domestic politics and global conditions (Cohen, 2015).

In summary, I believe that the independent variable of power nowadays must be modernized in economic, political, and monetary terms. Why? The answer is: Globalisation. Globalisation has changed the international system and disrupted international power (Kugler and Frost, 2001). The global system provides a pattern of more powerful countries (China, Russia) and institutions (World Bank, IMF or the United Nations) which makes power (more or less) diffuse, and because of which power only works through various channels, removing existing hierarchies and reducing the utility of military force (Keohane, 1998). China is increasingly becoming a leading member of the global community, and unlike the West would like to wish, it is coming with its own terms and by tempting other countries into the rules they dictate (Prasad, 2017). Globalization has proven thus far to be a challenge for powerful countries, since small or weak countries obtain access to alternative avenues. Consequently, this affects how monetary power will be exercised and the path that the world will take in the 21st century.

Appendix

I.A US dollar credit to selected non-bank borrowers

Figure 1.11: US dollar credit to selected non-bank borrowers (in USD bn)
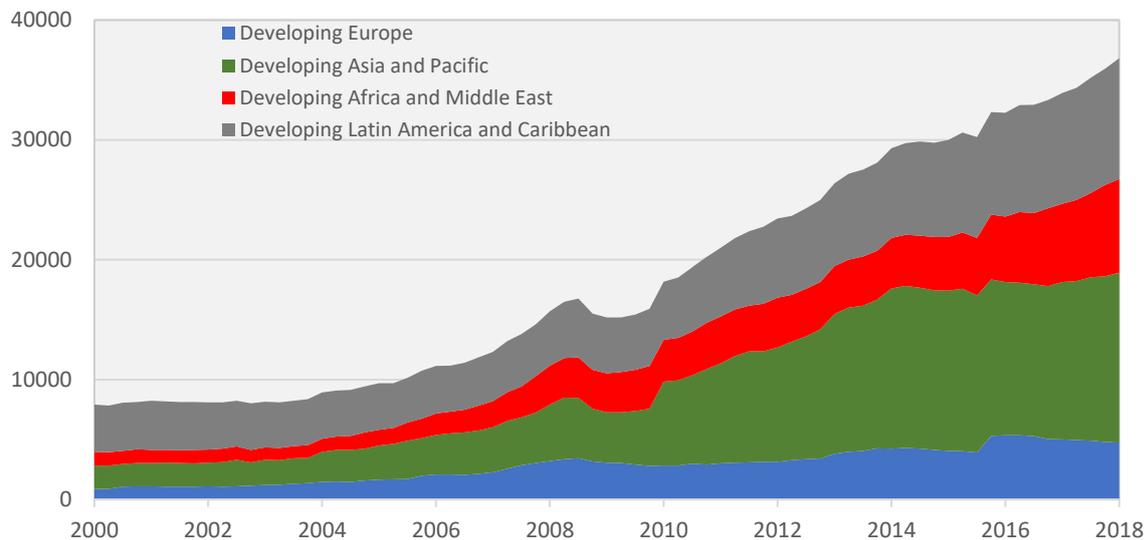
Source: Bank for International Settlements.

I.B Euro credit to selected non-bank borrowers

Figure 1.12: Euro credit to selected non-bank borrowers (in Euro bn)
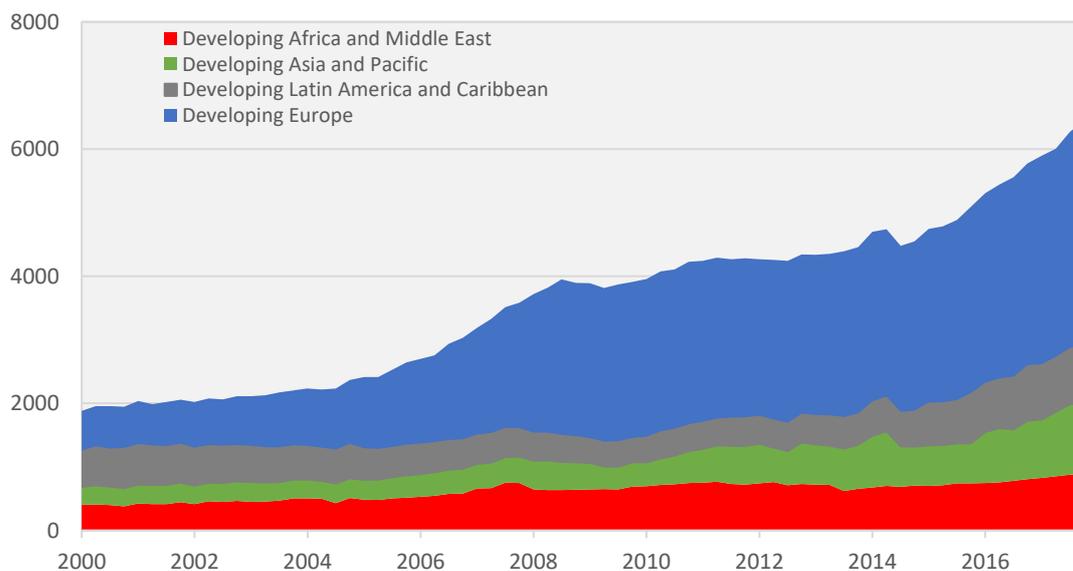
Source: Bank for International Settlements.

I.C Total Fund Credit & Loans Outstanding, African Countries 1967-1996

Table 1.7: Total Fund Credit & Loans Outstanding, African Countries 1967-1982 (in Millions of SDRs)

	1967	1968	1969	1970	1971	1972	1973	1974	1975	1976	1977	1978	1979	1980	1981	1982
Algeria																
Benin												5.39	5.39	12.65	12.7	12.7
Burkina Faso												5.39	9.33	12.65	12.7	12.7
Burundi		2.47	5.78	7.67	5.34				1.2	1.21	3.25	7.87	23.13	28	28.07	27.97
Cameroon							4.62	12.13	33.89	33.89	47.27	49.92	46.04	37.68	34.74
Congo, Dem. Rep					28.23	28.23	28.23	73.25	180.64	220.33	247.11	271.57	292.75	407.45	492.93
Ethiopia												11.19	55.77	62.29	124.39	145.64
Gabon												7.61	15.22	11.36	11.34	9.35
Gambia											4.26	11.7	10.36	12.67	21.7	36.35
Ghana	63.85	74.71	69.29	46.07	18.31	1.71			38.6	38.6	38.6	34.43	82.48	82.51	73.19	68.35
Guinea			0.5	3.45	2.95	2.95	1.02	9.51	7.11	7.11	18.38	19.98	26.16	27.45	23.67	34.95
Guinea-Bissau													1.1	1.1	2.95	2.68
Kenya						-		32.05	68.55	85.03	52.79	72.19	142.74	199.06	222.22	356.73
Morocco		34.09	37.49	27.54						115.46	127.56	220	231.88	358.35	497.37	897.52
Niger												5.39	5.39	12.65	12.7	12.7
Rwanda	5.5	5.93	4.94	2.93									5.76	10.62	10.69	10.69
Senegal									25.43	25.43	25.44	57	70.51	109.88	160.21	200.04
Somalia												0.14	0.14	14.03	39.98	72.22
Sudan	39.22	40.5	39.89	30.87	15.18	28.1	29.03	71.65	113.39	119.08	99.47	150.64	222.44	337.98	484.77	524.61
Tanzania									38.85	62.62	83.63	91.23	81.46	115.47	134.32	125.72	114.38
Uganda					9.99	9.99	9.99	14.97	24.07	32.72	32.72	29.2	26.2	70.11	182.45	265.92
Zambia					18.99	37.99	56.98	56.99	75.93	95.22	95.24	245.12	342.99	350.8	670.55	618.34
Zimbabwe															37.5	37.5

Source: International Monetary Fund.

Table 1.8: Total Fund Credit & Loans Outstanding, African Countries 1983-1996 (in Millions of SDRs)

	1983	1984	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995	1996
Algeria						-	470.9	470.9	695	578	342	793	994	1,412
Benin	12.48	11.4	10.33	7.79	5.26	2.96	7.76	6.31	15.65	15.65	31.3	48.79	56.6	68.94
Burkina Faso	12.48	11.4	9.27	6.73	4.2	1.9	0.44	0.05	6.32	6.32	15.16	32.48	50.52	56.52
Burundi	22.69	16.36	13.24	18.08	14.48	24.12	30.54	29.96	34.16	47.39	44.4	40.13	34.16	28.18
Cameroon	33.6	30.7	24.95	18.13	11.32	74.64	86.18	85.11	84.28	45.66	11.86	29.91	34.41	50.11
Congo, Dem. Rep	593.87	688.45	735.11	699.67	681.26	584.07	478.19	366.28	330.31	330.31	330.31	327.27	326.37	301.26
Ethiopia	127.64	100.22	64.76	68.76	53.37	40.84	22.98	4.51	\	14.12	35.3	49.42	49.42	64.17
Gabon	1.85			27.41	42.5	98.68	102.69	98.49	84.34	58.55	32.89	61.42	64.95	83.26
Gambia	33.52	33.65	30.36	24.13	26.65	25.69	28.67	31.51	30.61	28.39	26.68	23.94	19.84	14.71
Ghana	316.55	525.05	637.97	642.26	610.94	566.36	561.16	523.39	583.12	537.83	537.3	479.7	436.24	377.35
Guinea	34.28	32.29	28.35	32.93	40.09	36.08	46.65	36.17	38.39	46.32	44	48.63	63.11	57.32
Guinea-Bissau	2.26	3.73	2.8	1.87	3.14	2.2	3.75	3.75	3.75	3.75	3.45	3.15	3.98	5.33
Kenya	443.47	428.28	474.73	375.9	282.9	338.4	316.12	338.88	344.84	286.08	264.34	277.25	251.45	234.51
Morocco	985.48	1,107.19	1160.57	894.39	789.09	711.1	646.57	526.93	401.54	319.1	207.15	101.06	34.83	2.3
Niger	43.5	56.83	71.25	86.76	86.33	70.32	64.37	59.66	51.3	44.58	37.74	41.78	35.04	36.61
Rwanda	10.69	10.69	9.15	7.02	4.9	2.77	0.65	0.07	8.76	8.76	8.76	8.76	17.69	16.81
Senegal	220.45	234.67	243.74	236.25	241.64	236.54	240.42	220.95	228.9	197.36	177.81	205.43	233.31	226.46
Somalia	117.22	114.34	140.13	127.3	123.69	123.01	114.09	112	112	112	112	112	112	112
Sudan	666.65	677.6	672.68	672.68	672.68	672.68	672.68	671.64	671.64	671.64	671.64	671.64	645.67	621.15
Tanzania	88.11	60.19	52.62	58.15	80	105.1	97.82	98.35	100.2	160.5	156.22	145.22	132.68	143.41
Uganda	360.55	343.82	277.59	203.44	192.76	187.59	171.2	198.22	230.91	250.11	243.03	262.59	280.65	290.05
Zambia	678.51	753.79	728.94	701.63	698.8	698.8	685	666.74	641.62	615.62	565.83	551.2	833.43	833.43
Zimbabwe	191.1	261.32	240.47	191.06	110.3	52.2	22.24	4.84	-	157.2	205	257.5	310	304.07

Source: International Monetary Fund.

"The choice is between which mistake is easier to correct: Underdoing it or overdoing it."
[Timothy Geithner]

CHAPTER II

THE OFFSHORE CURRENCY MARKET

II.1 Introduction

One of the most successful institutional phenomena in international finance has been the growth of an external currency market, which is also referred to as an offshore market. The term "Offshore Currency Trading" refers to the intermediation of funds denominated in a currency outside the jurisdiction of the issuance. Offshore currency markets do not fall under the sphere of the national financial system but are linked through international transactions. The participants are mainly financial institutions, large corporations or non-banks such as governments and government-related borrowers. The offshore currency market is also sometimes referred to as the 'Eurodollar' or 'Eurocurrency' market.[55] The external currency market can be defined as a market that serves as a counterpart to the onshore market but differs from it by the separation of the denominated currency from the country of jurisdiction.

To establish an international currency, it requires that market participants can easily obtain the currency in the offshore market. An offshore currency market adds in the overall liquidity to the currency and provides the opportunity for it to avoid regulations set by the onshore market. The US dollar has the largest offshore market and offers its use in international trade and investment, reflecting its established position as an international currency. The offshore market

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[55] Eurodollars are dollars deposited into banks outside the United States. Eurocurrency refers to a financial centre outside Europe (e.g. Hong Kong or Singapore) and has become a general term for an offshore currency market. Hence, the most well-known Eurocurrency market is the Eurodollar market.

creates a unique network for the internationalisation process of a currency that enhances the usage and global status of a currency. The evolution of the offshore currency market reflects the changes in the perceptions of offshore currencies and the internationalisation process of a currency. Therefore, to analyse international currencies properly, the examination of the offshore market is crucial.

An offshore market requires that a particular financial transaction is less regulated than in the domestic market. Regulations imply (mostly) costs for the domestic market and consequently investors prefer to make transactions within the less regulated offshore market. Hence, the difference of fiscal and monetary regulatory policies provides an incentive to move their domestic currency activities to the offshore market. The absence of regulations also gives offshore banks the chance to operate more efficiently and cheaply, since the offshore financial environment gives higher freedoms in contrast with the political and regulatory interventions that occur through national authorities. These markets emerge in countries which offer developed financial structures, a wide range of financial instruments, and efficiently functioning institutions. Offshore currency trading has many benefits: it allocates resources more efficiently and the low transaction costs provide investors with better returns. Furthermore, it diversifies currency risks for investors and borrowers. The increase of offshore liquidity contributes to a deeper and wider foreign exchange market in the domestic currency, and therefore enhances the efficient pricing of onshore securities.

This also implies that the domestic currency falls under a different jurisdiction. For example, the exchange risk of one currency is exported to the financial and political environment where the financial centre of the other currency is placed. However, as soon as a country's currency begins to circulate outside its borders, it is likely to bring difficulties for the domestic central bank to responsibly maintain monetary stability.[56] Consequently, some countries want to isolate their domestic currency from the potential destabilizing influences of the offshore market.

The challenges of an offshore market have also been addressed in the research literature.[57] For instance, Cadarajat (2012) expressed concern about the reduction of the ability of monetary authorities to achieve an independent monetary policy. In particular, countries with a fixed

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[56] Studies that have addressed the effectiveness of capital outflow restrictions are, for instance, Miniane and Rogers (2007), Binici et al. (2010). See the figure in Appendix II.A, which reflects the relationship between onshore and offshore markets by using the Chinese renminbi as an example.

[57] See for instance Ishii (2001), Gao (2010), Craig et al. (2013).

exchange rate system have a higher chance of losing control over their own macroeconomic conditions. This risk raises the fear that offshore markets can act as an environment for exchange market speculation. The comparative lack of regulations makes it easier for speculators to move from one currency to another, for instance by borrowing a depreciation-prone currency in the offshore market and by holding assets in an appreciation-prone currency in its internal currency market. Offshore transactions in the domestic currency can be a destabilizing factor: First, authorities cannot conduct an independent monetary policy, particularly countries under a fixed exchange rate, which consequently leads to a loss over macroeconomic conditions. Second, offshore transactions can have a destabilizing impact on the onshore foreign exchange market.[58] This risk of destabilisation goes as far back as to the Bretton Woods system, were capital mobility in the offshore market contributed to the collapse of the system.[59]

In this regard, the development, benefits, and challenges of the offshore markets will be explored at greater length in this chapter. To measure the interaction between onshore and offshore markets, the Non-Deliverable Forward (NDF) rate will be applied. An NDF is a cash settlement and is theoretically similar to a forward foreign exchange contract but does not require the physical delivery of currencies. The forward foreign exchange contract is an obligation to buy or sell in a specified currency on a future date (settlement date) for a fixed price set on the date of the contract (trade date) (Lipscomb, 2005). On the contrary, on maturity with an NDF contract the settlement is made in U.S dollar, since the other currency, mostly an emerging market currency under capital restrictions, is "non-deliverable" (Lipscomb, 2005). The restrictions on foreign participation in the domestic foreign exchange market and offshore deliverability fostered the growth of the NDF market. The rapid globalization of Asian economies with capital restrictions has led to a multi-fold growth of the offshore NDF market.[60]

Countries with significant cross-border capital movements usually possess the most developed NDF market. Conversely, NDF trading begins to decline in cases where currency convertibility has been established. Since the NDF market does not fall under their regulatory sphere, monetary authorities regard its trading with caution. Furthermore, there are many factors that can affect the pricing of the NDF trading, such as trading flows, the expectation of changes in

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[58] Ishii et al. (2001).

[59] See Emminger (1977)'s detailed study of Germany's external and internal imbalance and the end of the Bretton Woods System.

[60] The Asian NDF market includes the following main currencies: Chinese Renminbi (CNY), Indian Rupee (INR), Indonesian Rupiah (IDR), New Taiwanese Dollar (TWD), and Philippine Peso (PHP).

the exchange rate regime, uncertainty, or speculation. This leads to the question when NDF and spot markets are segmented: which market moves first and consequently dominates the other market? Does the economic activity in one market affect the counterpart market, even though the latter is not directly involved? This event is also defined as a spillover effect and will later be analysed econometrically on the Korean won during the Global Financial Crisis 2008/09.

II.2 Background

The growth of the offshore market began with the US dollar during the Cold War, were the former Soviet Union and its allies protected their US dollar holding outside the United States' jurisdiction, as they feared that it might become confiscated. The Communists placed their dollars mainly in London, which not only became the origin-market for the Euro-dollar system but also the geographical focal point. The reason for choosing London was motivated by the chance to conduct international commercial transactions there, and also to establish somewhere, where they could later borrow Euro-dollars.[61] These dollars were circulating outside the jurisdiction of the United States, which meant that they were not subject to the policy of the monetary authority. The Eurodollar deposit market grew stronger as various types of regulation came to limit the use of dollar deposits by domestic companies.[62]

Generally, the depositor, the borrower and the intermediary all compare the advantage of an offshore transaction with the domestic market. The required condition for a sustained and long-term growth of an offshore market for deposits is that particular transactions are less regulated than in the domestic market.[63] But there are also convenience factors for investors and

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[61] The expression 'dollar deposits' is to a certain extent confusing, and here it properly means a 'placing' and 'taking' of Eurodollar deposits, and therefore a loan transaction. See also Einzig (1973) p. 11.

[62] The main structure of the Eurodollar market can be explained with the transaction costs and the demand and supply for dollars. The model from Niehans and Hewson (1976) pictured in Appendix II.B assumes a scheme in which dollars are channelled from lenders to borrowers through banks and a large amount of credits get passed through several banks, which can include the London financial centre. Niehans and Hewson (1976) assume high transaction costs between non-banks, otherwise they would contract directly. They also stated that transaction costs between non-banks and banks differ widely and that peripheral banks have higher transactions costs if they are in different locations compared to peripheral banks in the London centre. The Model also assumes that there are large excess demand and supply of funds in certain regionals areas or else there would be a number of single markets and the flow through the London centre would be small. See Niehans and Hewson (1976).

[63] The growth of an offshore market in terms of reserve requirements, interest rates, exchange controls and taxation are aspects that are determined by different kinds of regulations. Furthermore, the facets that explain why deposits grow more during certain periods than in others will be distinguished from the explanation as to why the offshore currency market exists. See also Aliber (1980).

fundraisers in terms of language, regulatory structures and certain legal aspects, for instance if a depositor or an investor can obtain higher interest rates on offshore deposits, since these deposits do not fall under interest-rate ceilings or reserve requirements. The higher the additional offshore rates over domestic rates are, the larger the incentive for investors to use the offshore deposit market. A commanding factor that explains the difference in interest rates between onshore and offshore deposits is the degree of reserve requirements. Another factor is the risk that is associated with offshore markets; the higher the perceived risk, the lesser the demand for offshore deposits for any interest rate that is given.

Since the introduction of the Eurodollar, a yield pickup has been available for depositing in a bank in London, or also in other countries outside the United States. During the 1980s the high yields on US dollars that were deposited offshore, were approximately the same as the cost of domestic reserve requirements. The incentive to hold dollar deposits offshore vanished in 1990, when the Federal Reserve reduced the reserve requirement to zero, but subsequently did not go ahead and closed the offshore market.[64]

II.2.1 Reserve requirements

Reserve requirements that are set by the central banks for offshore branches of domestic commercial banks have different effects and might not always be supportive for the development of an offshore market. For instance, an abrupt shift of funds between the offshore market and the domestic deposits might impact credit expansion, because of the change of reserve requirement. Hence, reserve requirement plays a vital role for a developed offshore market to manage its domestic monetary stability. For instance, if the domestic central bank wants to target monetary policy, they are also faced with the question of whether credit expansion in the domestic currency in offshore markets weakens the ability of onshore authorities to manage such changes. Since offshore banks are under another jurisdiction, they inevitably have different rules and restrictions.

Swoboda (1969) came up with the question of how much monetary or credit aggregate would expand if more deposits (for example 1 billion US dollars) were placed into the Eurodollar

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[64] See the article of McCauley and Seth (1992), who argue that bank lending to U.S enterprises rose rapidly during the 1980s and that the reserve requirements interacted with interest rates to give foreign banks an incentive to book loans offshore.

market. Various answers had been presented for this question. For instance, Aliber (1980) argued that the Euromarket's major banks that are active in the onshore and offshore markets are, for instance, required to hold a certain amount of reserves in the onshore market . These requirements are not supposed to affect their offshore bank branches.. The implication was that Euromarkets do not make it impossible to retain a certain degree of monetary control.

Another vital aspect is whether reserve requirements are applied on one currency or on all currencies. For example, if the U.S. monetary authority puts a reserve requirement on the offshore market, where U.S. banks are located, these offices would face a cost disadvantage compared to other offshore banks The level of disadvantage also depends on whether monetary authorities in other countries apply reserve requirements. The more countries apply reserve requirements to their offshore branches, the lower their competitive impact will be.

II.2.2 Offshore Markets and Capital Controls

In the 1970s the main role of capital control was to hinder the free flow of capital between countries. With greater economic integration, capital controls began to vanish among developed countries. By the early 1990s most monetary authorities conducted a more open economy, but this changed with the Asian financial crisis in 1997 and capital controls were reapplied. Krugman (1998) has argued that, if a country faces a financial crisis, then setting capital controls can help to stabilize its domestic economy. This happened, for instance, in Iceland, where during the financial unrest in late 2008, capital controls had been set to restore their financial market.[65]

Furthermore, in China capital controls act as a preventive tool to stop the capital outflow of deposits from Chinese banks and more broadly to avoid any disruption of the financial market (Wei, 2013). Prior to 1993, China even maintained a strict management of foreign exchange control, which did not allow the renminbi to float outside China. However, the Chinese authorities realized that this policy hindered them from moving forward economically, and so they gradually opened up their capital market. These policies of liberalization will help China

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[65] Forelle (2008).

to deepen and widen their financial market by improving their liquidity in the domestic equity market.[66]

During the Asian financial crisis of 1997, the Malaysian measures and reform that had been established did not work effectively enough to stabilize the economy. This forced the Malaysian monetary authorities to put capital controls in place. Furthermore, they closed the offshore market for the ringgit and ringgit assets. Investors had to repatriate all ringgit that was offshore back into the onshore market. Offshore banks were prohibited from trading ringgit assets, and residents were prohibited from receiving ringgit credit compared to non-residents (Tamirisa, 2004). The capital controls in Malaysia were also set with the aim of closing the offshore market, i.e. all channels without leaving any loopholes (Johnson et al. 2006).[67] The case of Malaysia was an example that showed the risk of open capital borders and an active offshore market, particularly for emerging market economies.

Another consideration is that open capital borders raise the risk of an offshore market that is dominating the domestic market, particularly if the domestic market is relatively small.[68] For larger economies without capital controls, offshore markets do not play a major role, as long as there are no restrictions on investment in the domestic bond market. Hence, some argue that foreign investment in domestic bonds of the United States has lowered bond yields and has stimulated interest-sensitive sectors such as residential housing.[69] Prior to the Global Financial Crisis in 2007/08 New Zealand and Australia had a shortage of domestic high-quality bonds, issued by domestic debtors. The offshore market in effect recruited high-quality global issuers to supplement the amount of high-quality domestic issuers (He et al. 2010).

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[66] The central bank of China, the People's Bank of China (PBOC), announced in June 2011 the Circular on Clarification of Matters Relating to Cross-border Renminbi Business. This clarified that investors can use renminbi to set new enterprises, equity transfers and in order to increase capital for enterprises. This reform was followed by the Ministry of Commerce (MOFCOM) in October 2011, which issued the Circular on Issues Relevant to Cross-border Direct Investment in Renminbi. These measures allowed new foreign investors to make investments directly into China, with legally obtained Chinese renminbi from the offshore market. For more on the development of Chinese capital controls, see Wei 2013; Gunter, 2004; Ljungwall 2008 and Luo et al. 2010. Also, between 2014 and 2016, capital controls were applied to capital outflows. This last measure is one that could be repeated.

[67] This is only an overview. The Malaysian authorities had also introduced a wide range of fiscal and monetary policies to stabilize the economy.

[68] For instance, the New Zealand bond market is the most internationalised in the world. Most of the bonds are offshore issues (Munro et al. (2010)).

[69] See for more He et al. (2010) and Warnock et al. (2006)).

II.2.3 The cost of limiting offshore trading

Limiting or prohibiting the offshore domestic currency trading might be effective to stabilise a currencies exchange rate but it is also connected with various costs and risks.[70] The existence of capital regulations, not stainable monetary policies can cause interest rates or exchange rates to move out of equilibrium (Watanabe et al. 2002). Countries with heavy capital restrictions were confronted with the development of black markets, and countries under interest regulations faced the development of a black market for loan and deposits (Watanabe et al. 2002).[71]

For example, measures to limit the Malaysian ringgit offshore trading had a very negative impact on the country's market confidence, which caused the country to become eliminated from major investments and to become downgraded by several rating agencies. It additionally became more expensive for Malaysian banks to access the international financial market and, trading in spot, futures and forward markets had fallen sharply (Johnson et al. 2003). In 2016 the Malaysian authorities became worried about the sharp drop of the ringgit exchange rate, caused by the slowdown of China's economy and the US election. The central bank governor, Muhammad Ibrahim, blamed "the arbitrary and unpredictable devices of the offshore markets" and ordered local institutions not to participate in the NDF market. Nevertheless, illiquidity in the offshore market might worsen if banks retreat. Should non-residents be unable to hedge against currency exposure, they will be less eager to purchase ringgit assets, and this can cause an even weaker Malaysian ringgit (The Economist, 2009).[72]

Measures to limit offshore trading can bring about non-speculative economic and financial transactions, which would reduce the range of banks and corporations who are willing to invest and hedge against different financial risks. It can hinder the domestic financial market from developing, since these banks and corporations not only have lower liquidity but also have a lower depth of forward markets. Furthermore, there would be a major administrative burden,

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[70] The difficulties for currency non-internationalisation, such as limiting or prohibiting the offshore use of a currency, will be shown in Chapter III in the case of the Deutsche Mark.

[71] In 1997 different factors generated a strong speculative pressure in Thailand's market against the baht. While the regulations, which were conducted by the government and which focussed on the supply of baht to the offshore market, pushed a rise in offshore baht interest rates, they were unable to hinder the speculative wave that baht would be devalued (Watanabe et al., 2002).

[72] Generally, the Malaysian ringgit is not an actively traded currency in the NDF market, since they have capital controls. This was caused after September 1998, when Malaysia moved to a fixed exchange rate and could therefore not develop an offshore NDF market. Hence, in July 2005 the monetary authorities removed the peg.

since authorities had to cover all possibilities of money circulating outside its borders.[73] To prevent a country from accessing a more liberalized and developed financial market can also sometimes require preventing a country from obtaining different financial products and instruments that could have helped to reduce transaction costs. A worst-case scenario of prohibiting offshore trading would be that domestic enterprises move to the offshore market, which would in fact be more damaging to the domestic economy. Finally, if the measures were strict and accompanied by macroeconomic policies, it can also rouse speculation. All in all, setting restrictions on the offshore market would not be effective for a currency internationalisation process, as it promotes the use of a currency in worldwide trade and investment across countries and different time zones.

II.3 The offshore market and international currencies

The number of currencies that fulfil the six roles of an international currency is obviously very limited, with the dollar still dominating, followed by the Euro. Monetary scholars have used different measures to cover vehicle currencies, e.g. the currency composition of international foreign exchange reserves, or its usage as an investment currency or as an invoicing currency, as an indicator for the international use of a currency.[74] The development of the domestic financial market is a crucial determinant for the status of an international currency.

For instance, Eichengreen (2011) stated that the strength of the U.S. financial market relative to that of the United Kingdom was a key factor in the rise of the U.S dollar's reserve currency status. History has revealed that a vehicle currency typically attains its status under unique circumstances and because it is driven by different motivations. The most relevant aspects for the domestic financial market are breadth, depth and liquidity. Breadth describes the availability of a wide array of financial market instruments. Depth stands for a large volume of financial instruments in specified markets, and liquidity measures the high level of trading

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[73] This was also the case in Malaysia in the aftermath of the Asian financial Crisis. See further Ishii et al. (2001) pp. 29ff.

[74] For instance, Chinn and Frankel (2007) conducted a study on the future role of the US dollar as an international reserve currency. They came to the conclusion that an entrance of the United Kingdom into the Eurozone would push the Euro forward and eventually surpass the US dollar from its throne. Another study into the prospects of the US dollar share in international reserves has been analysed by Eichengreen (2009), who looked at the history of international reserves and concluded that in the wake of the financial crisis 2007/08 alternative currencies will pressurize policymakers to set effective monetary policies to maintain investors' confidence.

volume (Prasad and Ye, 2013). A lack of liquidity in the offshore market would keep investors at a distance and make them reluctant to use the currency. An international currency goes hand in hand with an active offshore market.

Generally, an international currency can provide many benefits, but it also involves costs for the country of issuance. Since financial markets around the world are becoming more and more developed and are setting reforms for the international use of their currencies, it is essential to revisit their evolutionary history in developing an offshore currency market. Therefore, the experience of some international currencies – namely the Japanese yen, Korean won, and the ongoing process for internationalisation of the Chinese Renminbi – will now briefly be discussed.[75]

II.3.1 The case of China

Chapter 1 of this thesis highlighted different conditions that must be in place in order for a country to internationalise their currency, which included being the provider of political and military power, economic size, financial strength and financial market development (Frankel, 1999;Michalopoulus, 2006). The functional domain of individual currencies will be defined by the stability and predictability of a currency's value. Furthermore, the internationalisation of a currency requires a low inflation, a stable interest rate and exchange rate, and a fully convertible currency to guarantee the availability of the international currency (Frankel, 1999 and Michalopoulus, 2006).[76]

Since the aftermath of the global financial crisis, the Chinese authorities have put great effort into enhancing the cross-border use of the Renminbi. The first step for the liberalisation of China's capital account was the liberalisation of inbound Foreign Direct Investment FDI flows in China. The policy-related incentives for inwardly direct investment reflected China's efforts

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[75] The focus in this chapter is the offshore market for emerging market currencies. But the largest and deepest currency offshore market has been owned by the US dollar. To understand how a currency offshore market develops, it is essential to revisit the globalisation process of the US dollar as an offshore currency. For this reason, this history has been added in Appendix II.C.

[76] The term 'convertibility' of a currency describes the degree to which a currency can be exchanged which varies widely across countries. There are some countries that pass restrictions of their domestic currency or require permission if more than a certain amount needs to be exchanged. For instance, the Chinese Renminbi is not a fully convertible currency. A fully convertible currency can be hold and used by non-residents or countries with restrictions. See for more McKinnon (1979) and Greene (1991).

to financially open up and attract a massive amount of FDI inflow. Its sharp growth of FDI became an important factor in China's global financial market integration, and, with regard to its production network, Asia has been the major source of China's FDI inflows.[77]

China is promoting the offshore use of the Renminbi through a number of different strategies. The PBOC began to allow trade transactions with the renminbi and to loosen restrictions on cross-border remittance of the renminbi. The authorities also allowed the issuance of renminbi-denominated bonds ("dim-sum" bonds) in Hong Kong by non-residents living on the Mainland (Prasad and Ye, 2013). Several swap agreements with other central banks had been signed too.[78] China has benefitted highly from Hong Kong's platform that offers these measures, without fully liberalizing its capital account. Mr Norman Chan, Chief Executive of the Hong Kong Monetary Authority (HKMA), suggested that "the internationalisation of the renminbi involves linking of the onshore and offshore market renminbi markets through three bridges, namely trade settlement, direct investment and portfolio investment. The renminbi trade settlement scheme has largely been liberalised and this bridge is the widest, while arrangements for the use of renminbi for inward and outward direct investments are in place already. The bridge for portfolio investment in renminbi is also being built progressively. For instance, offshore central banks/monetary authorities, banks and insurance companies have now been granted with quotas for investing in the Mainland interbank bond market. The HKMA's quota was RMB 15 billion yuan initially and it has been increased recently to RMB 30 billion yuan."[79] Hong Kong is China's main gate to launch the renminbi offshore.

Nevertheless, it looks as if China has reached its limit, unless they further open up their capital account to curb the development of offshore renminbi (Prasad and Ye, 2012). For instance, Maziad and Kang (2012) conducted an empirical study on the Renminbi internationalisation and its onshore/offshore market relationship. They found that the offshore market dominates the domestic market and suggested that the offshore market is still immature and needs more assets to maintain the momentum of Renminbi internationalisation. Another study by Craig et al. (2013) was carried out on the offshore use of the renminbi in Hong Kong and its liberalization process. They found that, in light of the financial crisis, capital account measures

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[77] Since 2001 Asia FDI flows have accounted for over 50% of China's total FDI inflow (Destais (2016) and Goldberg (2010)).

[78] Trade settlements occur mainly on the import side and dim-sum bonds do not play a large role in the industry, and where so primarily in the banking sector. See Appendix II.D. for a list of countries that have signed bilateral swap agreements with the PBOC.

[79] See also HKMA (2012).

have been used more actively to promote the use of the Renminbi offshore, but not symmetrically the other way around. Capital inflows had been eased more than capital outflows.[80] Cheung and Rime (2014) analysed the role of offshore markets for the renminbi internationalisation but came to the conclusion that the offshore market will advance the international use of Renminbi and solidify its acceptance.[81] However, the global acceptance of the Renminbi will and is still being determined mainly by the monetary policy of the PRC and the global political dynamics. China's multibillion dollar investment program, "The Belt and Road Initiative" (BRI), supported the creation of partnerships with countries in Asia, Africa and some parts of Europe (see Figure 2.1 below).

Figure 2.1: The Belt and Road Initiative

Source: McKinsey & Company (2016).

The BRI plan has two main components. The 21st Century Maritime Silk Road is planned to connect regional waterways, while the Silk Road connects Europe via Central Asia, the Persian Gulf Mediterranean, and the Indian Ocean. China's investment efforts in several African countries has additionally pushed the use of renminbi. African countries are now considering adding the Chinese yuan and mixing foreign reserves. Adopting the renminbi can help African

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[80] It is important to bear in mind here that the efforts of renminbi internationalisation have been strengthened by the Hong Kong authorities, who supported the development of the offshore market. For instance, they focused on trade settlements in renminbi, foreign direct investment, and banking flows. These measures expanded Hong Kong's role as a financial gateway to China.

[81] See also Cheung et al. (2014).

countries to pay loans that they owe back to China.[82] The concern is that Africa's emerging economies might this way become too reliant on China. This dependence has some negative side effects. For instance, the renminbi's sell-off that began in June 15, was increased with President Donald Trump's threat to hike up tariffs. The onshore spot rate also fell by 0.45 per cent to 6.6084 per dollar (Figure 2.2).[83] The renminbi became a source of volatility, and further weaknesses in the currency might hit the whole emerging market complex. Hence, some refer to this internationalisation process as "capital account liberalization with Chinese Characteristics."

The internationalisation of the Renminbi is still in its formative phase, but the market has grown due to financial innovation, liberalized capital controls and regulations.[84] Despite this progress, the Renminbi is not yet an international currency.

Figure 2.2: Yuan/USD rate
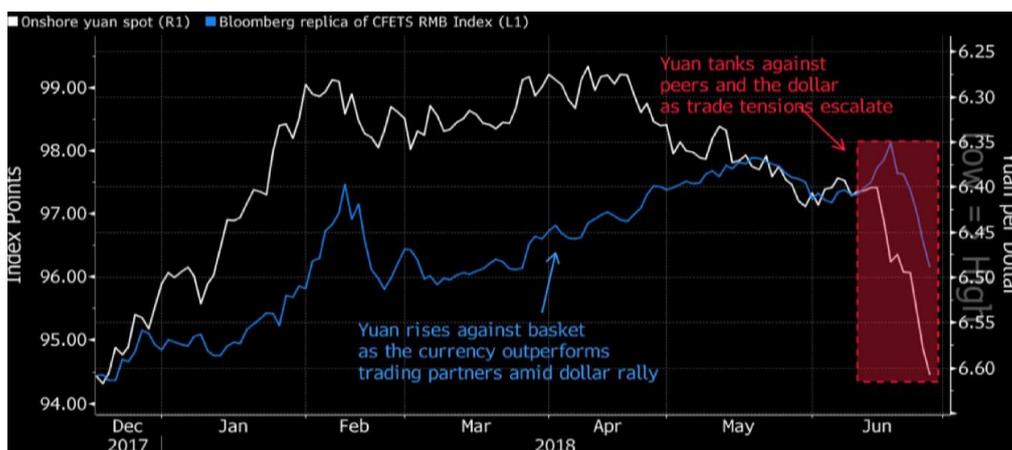
Source: CEFTS, Bloomberg. Taken from Chen and Curran (2018).

It will be difficult to establish a renminbi offshore market, when the Renminbi is still not fully convertible (Gao and Yu, 2009). Consequently, without a well-developed offshore market the internationalisation of the Renminbi will be difficult and perhaps the current situation shows that the renminbi may not be ready (Gao and Yu, 2009).

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[82] According to the Centre for Global Development, Djibouti's infrastructure loans from China are equal to 75 per cent of their GDP. See also Jinchen (2016).

[83] See Chen and Curran (2018), as well as the following article: https://www.bloomberg.com/news/articles/2018-06-26/china-s-role-as-a-market-anchor-at-risk-with-rapid-yuan-slide.

[84] See Goodman (1993) for a study on capital controls.

II.3.2 The case of Korea

The Korean economy represents a different example for its onshore/offshore links owing to the government's effort to internationalise the Korean won. Korea has one of the world's largest economies, with an immense volume of trade and capital flows (Kim and Suh, 2009). The Korean banking market is the third largest in Asia, and its equity and bond market are among the largest within Asia (Kim and Suh, 2009).

However, compared to their large financial market and its economic status, won-denominated financial transactions are still very low. Around 80% of imports and exports are denominated in US dollar (Kim and Suh, 2009). Kim et al. (2011) have shown that the internationalisation of the won is an ongoing process and the exact date is difficult to identify. They proposed that the year 2001 can be used as the beginning of the process of internationalisation, since several reforms to liberalize the Korean won have been set out then.

Further studies by Rhee (2011) and Kim (2009) addressed the potential of the Korean won's internationalisation and the move to greater trading outside its jurisdiction. Both these scholars' papers came to the conclusion that greater internationalisation would benefit the economy, particularly during the financial crisis, that Korea would have more opportunities to secure foreign exchange funding, and that the impact of a financial shock would be eased. However, both authors also highlighted the disadvantages of an international currency and the potential rise in the country's vulnerability to external shocks. They emphasized that the focus should be on strengthening regional currency and on promoting macroeconomic stability.[85]

II.3.3 The case of the Japanese Yen

Leading up to the middle of the 1970s, the Japanese monetary authorities generally discouraged the international use of the yen (Chen and Shu, 2009). Frankel (1984) stated that the Japanese monetary authorities "were concerned that extensive foreign holdings of their currency would reduce their degree of control over the money supply and would increase the variability of the

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[85] A regional currency is a medium of exchange that encompasses a large geographical area and is used in addition to the domestic currency of the country.

exchange rate."[86] Their concerns led them to tightly control their financial system when it came to the quantity and distribution of credit, as well as when it came to interest rates which were set below the market level. Additionally, the monetary authorities set controls on capital mobility to insulate the domestic financial market from foreign influences.[87] Morgan Guaranty (1984) observed that the guiding principle regarding foreign influences was to "forbid virtually all capital transactions, except by prior approval. "

The situation shifted in the mid-1970s, however, when several factors required Japanese authorities to deregulate their financial market.[88] The attempt to internationalise the yen began actively in 1984 in the context of a yen/dollar agreement. The government defined this process of internationalisation as reflecting "the expanding role of the yen in the international monetary system and the growing weight of the yen in current account transactions, capital account transactions and foreign exchange reserves" (Ministry of Finance, 1999).[89] The authorities began to lift capital controls and agreed to give U.S. banks and financial institutions favourable treatment (Takagi, 2011). The monetary authorities expected that the internationalisation of the yen would lead to an appreciation against the US dollar, which did not happen. The Plaza Accord between Japan and other G7 nations agreed to intervene in the foreign exchange market to push the dollar down. The Japan offshore market opened in December 1986, and with a market volume of 400 billion at the end of 1988 it grew rapidly.

The main objective of launching an offshore facility for the yen was to "establish Tokyo as a centre for the world's transactions in yen and thus aid the expansion of euro-yen transactions and the progress of internationalisation of the yen" (Suzuki, 1987). Osugi (1990) stated that the volume of the offshore market was "on par with [those of] the neighbouring offshore markets of Hong Kong and Singapore". However, the Japanese offshore market still contained restrictions, which included the limited authorization of counterparties to non-residents (with

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[86] The German central bank, the Bundesbank, had raised nearly the same concern regarding the Deutsche Mark circulating outside its borders, and that an increased demand could hurt exports' competitiveness. See Emminger (1977).

[87] For instance, in 1979 only 25 per cent of Japanese exports, and 2 per cent of imports, were denominated in yen. Japanese financial markets remained most of the time closed and under immense regulations (Frankel, 2011).

[88] There is a wide body of literature which discusses Japanese financial deregulation. See for instance, Frankel (1984), Suzuki (1987), Rosenbluth (1989), Tavlas (1991), Takagi (2011).

[89] These and other liberalizing measures have been implemented regarding Euro-yen lending. On the 1st December 1984 authorisation to issue euro-yen bonds by non-residents was extended to include private corporations. In April 1985 the authorities further relaxed the issuance of Euro-yen bonds by non-residents, and also the withholding tax that was imposed on non-residents' interest earnings on Euro-yen bonds, which was issued by Japanese locals, was abolished. In June 1985, foreign banks were allowed to obtain an extended access to the Euro-yen bond market, and in November 1987 non-residents were allowed to issue Euro-yen commercial papers. By May 1989 the Euro-yen lending to residents had been relaxed (Tavlas, 1991).

the exception of offshore accounts held by residents' banks). Furthermore, security transactions were prohibited, and local tax and stamp duties still applied, and individuals are excluded from participation (Osugi, 1990).

Tavlas (1991) observed the path of the yen's internationalisation on account of the following three aspects. First, Japanese net long-term capital outflows were predominantly invested in foreign currencies' denominated securities, which reflected the long-term interest rate differential for U.S dollars of Canadian dollar assets. Second, during the 1980s, Japan functioned as an international financial intermediary, borrowing short-term and lending on a long-term basis to the rest of the world. Third, Japanese banks mainly operated in the maturity transformation of external funds denominated in other currencies. This indicates that the yen was not a main provider of denominated liquidity to the international monetary system. The heyday's of the yen's internationalisation was in 1991, when 9 percent of global foreign exchange reserves were denominated in yen (Tavlas, 1991).

On the other hand, the international policy during the 1990s shifted toward internationalisation with the purpose of reducing the exchange rate risk for domestic enterprises, facilitating business for Japanese banks and other financial institutions, and with a comprehensive package of financial liberation reforms that were announced in 1996 (Takagi, 2011). Nevertheless, over the next two decades the indicators of the yen's use as an international currency, in the form of reserves, foreign currency turnover and denomination of international debt securities, declined.[90] Additionally, the yen was barely used as a unit of account for trade invoicing, particularly in comparison with other major currencies, e.g. the U.S. dollar, and other major European countries. The yen became a funding currency and the internationalization effort did not show the expected outcome, which was perhaps a result of the stagnation of growth in the Japanese economy. For international financial transactions, the choice of the denomination currency depends on many factors, including the level of interest rates and market expectations about prospective exchange rate changes.

This probably explains why the yen was more used during the 1980s and 1990s than it is today. The problem was that the Japanese financial market remained thin and had several restrictions. For instance, the treasury market was mainly inactive, and restrictions on Euro-yen investments, as well as on trading in the government repurchase market, were difficult (Takagi, 2011). According to Tavlas (1991) the main factors that hindered the yen from

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[90] The three years prior to the Japanese crash in 1990 contributed to the unbalanced international use of the yen.

internationalization were: (i) the rising share of exports to developed countries, which made it more likely to impose imports in their domestic currency; (ii) the fact that, in order to hold their market shares, Japanese exporters denominated mainly in foreign currencies; (iii) the exports to non-Asian developing countries, which fell during the 1980s; and (iv) the fact that the bankers' acceptance market was little, which curtailed the global use of the yen. In July 1998 the Ministry of Finance (MoF) requested that the Foreign Exchange Council intensify the internationalisation of the yen. In 2003 the MoF summarised the progress of the internationalsation of the yen. The report stated that Japan's prolonged recession and the resulting loss of confidence repeated the possibility of a slow yen internationalisation (MoF, 1995).

In summary, the efforts of the internationalisation of the yen between 1994-2003 were beneficial in terms of freeing the Japanese economy from regulation and encouraging capital mobility. The outcome was higher financial market integration and a doubling of cross-border assets and liabilities between 1994-2003.[91] The yen has been an important global currency, but it has not come close to the US dollar or to the euro, even whilst it is not less important than the British pound or the Swiss franc. The yen is used globally, and more than half of its trading occurs offshore (Takagi, 2011). Japan's efforts boosted the yen's internationalisation, but it has not been sufficient to endow it with greater global influence.

II.4 The Non-Deliverable Offshore market

Domestic currencies which are not fully convertible – or what are called non-deliverable foreign exchange forwards – play an important role in the offshore market. The forward foreign exchange contract is an obligation to buy or sell in a specified currency on a future date (settlement date) for a fixed price set on the date of the contract (trade date). In an NDF contract the settlement is made in U.S. dollars, for since the other currencies' market is under capital restrictions, it is "non-deliverable".[92] The settlement exchange rate is determined by a daily posted rate (fixing rate). The fixing rate is mostly based on the spot rate of the domestic

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[91] During the 2000s the yen has been actively used as a borrowing currency, as investors took advantage of the low interest rates and invested in higher yield currencies (Hattori et al. 2009). In the aftermath of the global financial crisis in 2008, Iceland, Hungary and some European countries had their debt mainly denominated in yen.
[92] The standard NDF contract is mostly settled in US dollars (This chapter focuses on NDF contracts which are settled in US dollars). There is limited trading of NDFs against other currencies. Hence, there are some type of NDF contracts that are settled in only one currency, for instance the Brazilian real. See Appendix II.E for an example of an NDF contract.

currency.[93] The terms of the NDF contract determine, if at maturity, whether the prevailing spot exchange rate at the time is greater than the exchange rate on the agreed forward exchange rate. Hence, the holder of the contract has to pay to the counter-holder the difference between the contract forward price and the spot market rate.

NDF contracts are a risk management tool to hedge against currency fluctuations, and functions mainly for emerging market countries with restrictions in their domestic markets.[94] NDFs are typically used by banks, multinational corporations, investors, and for property trade. Additionally, NDFs can be used for currency arbitrage or as a tool to enable locking in the higher yields of emerging market currencies.

Offshore non-deliverable forward markets first arose around 1990 in Latin American currencies, and then developed into some Asian countries, since companies were interested in trading with counterparties in countries who were constrained by capital restrictions and by the absenteeism of a forward foreign exchange market (Choudhry, 2007).[95] Data from the Bank of England on London trading, and from an electronic broker, show that the NDF market grew sharply from April 2008 until April 2013, even more quickly than the forward market or the foreign exchange market (BIS, 2014). The pricing of the forward foreign exchange contract is mainly based on the interest rate parity formula, that measures the equivalent returns over a time frame based on two currencies' respective interest rates and the spot exchange rate (Cadarajat and Lubis, 2012).[96] Additionally to the interest rate parity calculations, there are other factors that influence the pricing of NDF contracts, like market liquidity and counterparty risk (Lipscomb, 2005). Foreign participation in the local capital markets of most emerging Asian markets is still constrained by a number of factors.[97]

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[93] The fixing spot rate is based on a reference page, e.g. Reuters or Telerate, with a backup of calling between three and five market banks (Shamah, 2003)

[94] The key impediments of emerging market currencies have been described as being characterized by the following aspects: limited currency convertibility; central bank regulation; illiquid markets; limited hedging vehicles; higher volatility; cross-border risk, and withholding taxes (Parreñas and Waller, 2006). Appendix II.F presents key factors of foreign participants in local capital markets of selected Asian countries.

[95] According to Debelle et al. (2006), the first path of NDF trading began with the Australian Dollar in the early 1970s, in the presence of capital restrictions. These restrictions were removed in 1983 by the time that the Australian Dollar began to float. After the removing of these capital restrictions, the hedging market diminished over several years and was replaced by the deliverable forward market that exists today. However, the main focus here lies with NDF trading as it takes place in emerging market economies.

[96] The basic formula for determining the outright price for an NDF contract is: (spot rate-quoted currency X per dollar)*((currency X interest rate) * (# of days/360))/((dollar interest rate) *(# of days/360)). The day count conventions can vary from market to market (Lipscomb, 2005).

[97] See Appendix II.F for key impediments in Asian markets.

It is arguable that the different prices in different offshore markets are a result of the availability of NDF sellers. For instance, the liquidity problems of the Indonesian Rupiah in the New York and Singaporean offshore markets may have different quotations. NDF prices are determined by expected changes in the exchange rate regime, speculative positioning, the situation of the domestic onshore interest rate markets, and the relation between the offshore and onshore currency forward markets (Lipscomb, 2005). The pricing differential between onshore and offshore markets widens under especially tense market conditions. For instance, the global financial crisis in 2008/09 triggered a spike in pricing deviations in markets across the board.

II.4.1 How the onshore/offshore interest rates spread

If monetary authorities plan to target the short-term interest rate, then the impact of offshore markets on onshore interest rates needs to be considered. Offshore markets with capital controls tend to have a yield curve that is more distinct from the onshore counterpart (He et al, 2010). In particular, when the domestic currency is under upward pressure, then the onshore yield curve tends to be higher than the offshore counterpart. One possibility to measure the degree of cross-border segmentation triggered by capital controls is to measure the spread between onshore and offshore interest rates.

In an ideal world in which the same asset is traded in two different markets, and in which this assert reflects the same information, both markets in due course become perfectly integrated and the efficient market hypothesis would hold. This hypothesis is based on the theory of efficient markets, in which prices fully reflect all information that is available. This means that the movement in one market's price should be reflected in another market's price which sells the same asset. The efficient market hypothesis focuses on information efficiency, and explains that it is not possible to consistently overtake the market by taking both markets and risk into account.

The interrelation between the onshore and offshore NDF markets, without capital controls, can be described by means of the following equation:

$$\text{Ft} = \text{St} \times (1 + i_t) / (1 + i_t^{usd}) \qquad\qquad (2.1)$$

In this equation, which reflects the covered interest parity, Ft denotes the forward exchange rate, St denotes the spot exchange rate, i_t represents the interest rate for the domestic currency, and i_t^{usd} denotes the U.S interest rate respectively (Cadarajat and Lubis, 2012).[98]

Under capital controls, when non-residents cannot fully enter the onshore market, then the NDF applies as a substitute for the forward exchange rate:

$$\text{NDF} = \text{St} \times (1 + i_t) / (1 + i_t^{usd}) \qquad\qquad (2.2)$$

Spreads between onshore and offshore markets can reflect the direction of the underlying market pressure on these currencies. If the onshore yield is traded above offshore rate, it might create an appreciation pressure on the domestic currency and, vice versa, lower interest rates in the onshore market than the offshore yield may suggest depreciation pressure on the domestic currency. The Changes in capital controls can cause changes in information integration between onshore and offshore markets (Cadarajat and Lubis, 2012). [99]

II.4.2 Overview of the NDF market

According to Lipscomb (2005), New York tends to lead the trading of Latin America's offshore NDF, while Singapore and Hong Kong dominate the Asian NDF market. Hence, all foreign exchange transactions involving the Singapore dollar and the Hong Kong dollar occur in deliverable onshore markets, since these countries do not have any boundaries (Goswami and Sharma, 2011).[100] The derivative markets outside the Hong Kong SAR and Singapore largely retain a domestic focus, and do not have a comparable development, with a few exceptions. According to the Triennial Survey that was carried out in April 2013, 127 billion US dollars had a daily NDF turnover and grew in April 2016 to 134 billion US dollars, an increase of 5.3% (see Table 2.1).[101]

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[98] See also Ma et al. (2004), Wan et al. (2014), McCauley et al. (2014)
[99] See also Ma et al. (2004), Wan et al. (2014), McCauley et al. (2014)
[100] See also Guonana et al. (2004).
[101] According to Moore et al. (2016) the NDF market grew with the increased trading of swaps and forward in the broader global foreign exchange market.

Table 2. 1: Average daily Global NDF turnover, in millions of US dollars; April 2013 and April 2016[1]

	USD vis-a-vis								EUR	JPY	Other	Total
	CNY	KRW	INR	TWD	RUB	BRL	Other	Total				
2013	17,08	19,56	17,20	8,85	4,11	15,89	36,79	119,51	1,64	973	4,43	126,56
2016	10,35	30,07	16,42	11,50	2,92	18,65	60,28	130,22	1,30	1,42	1,06	134,01
Memo: % Change												
Unadjusted	17.36	-39.36	-4.52	29,90	-28,9	17,36	63,85	8,97	-20	45	-76,1	5,89

[1]Adjusted for local and cross-border inter-dealer double-counting.

Sources: BIS Triennial Central Bank Survey and authors' calculations.

This expansion is consistent with the general growth for emerging market currencies. Domestic restrictions on obtaining currency by foreign investors have led to the growth of sizeable and liquid non-deliverable forward markets, particularly in the cases of Taiwan, Korea, India and China (Goswami and Sharma, 2011). The six currencies that were reported by the Triennial Survey showed a total growth of 8.7%. Despite the six surveyed currencies in Table 2.1, NDF markets are also active in other currencies, for instance in the Indonesian Rupiah, the Malaysian ringgit, and the Chilean pesos.

Participants in an NDF contract often make use of third-party NDF voice brokers to obtain or off-set an NDF transaction with other major banks. The major task of voice brokers is to offset the currency risk which comes with NDF transactions. In fact, since the broker market for the main currencies disappeared, market makers estimate that around 80 per cent of their non-client NDF trades are mediated by voice brokers. With the help of brokers, financial institutions propose that the major NDF markets has enough depth and liquidity, in order to enable offsets of their positions as incurred through market-making actions (Lipscomb, 2005). When a country has a well-developed domestic currency, a well-developed interest rate market and good regulatory flexibility, global banks are able to offset the currency risk of their NDF locations to a certain extent with onshore counterparties (Lipscomb, 2005).[102] The prices of NDFs reflect the low transaction costs, given the regulatory complexities of dealing with products in non-convertible currencies. The price differential for onshore and offshore NDF rates increases when the perceived onshore risk premium increases.

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[102] For a short period, the Korean monetary authorities tried to limit the effect for NDF demand in the domestic market by prohibiting local banks from interacting in the NDF market. The goal was to diminish the need for the central bank to intervene, since the outcome of demand by foreigners for long Korean won positions would be limited in the onshore market (Misra and Behera, 2006). This policy was reversed, as it unfavourably affected local banks.

As has already been mentioned, restrictions on foreign participation in the domestic foreign exchange market fostered the growth of the NDF market. McCauley (2016) pointed to three paths for the development of foreign exchange markets: first, a sudden liberalisation of foreign exchange trading and the capital account; second, market development around an enrooted NDF market; and third, a regulated opening of the foreign exchange market with constant capital controls.

For example, the Russian rouble followed the first path. During the second half of 2004, their activity in the offshore NDF market increased. With a current account surplus, foreign exchange reserves and the plan to internationalise, the Rouble was made fully convertible in the middle of 2006. Among the six currencies presented in Table 2.1, the NDF share of the Russian rouble is the smallest, but the rouble has remained strong for over 10 years and has even enjoyed a revival. The explanation for this revival concerns the credit and legal issues since 2014, which had extended the development of NDF contracts. Becker (2014) stated that the ongoing sanctions on Russian financial institutions and energy firms led non-financial firms to use NDF contracts. The ongoing tension and uncertainty in the foreign exchange market caused an increase of the premium to trade Russian roubles offshore. Prior to the Crimea referendum, the nine-month and one-year USD/RUB NDF contracts were trading at a premium (indicating a lower yield) to onshore deliverable forward contracts. After the referendum, traders noted that the premium had been stretched to one-month and three-month long NDF short-term contracts.[103]

The Korean won followed the second path, in which the market develops into an enrooted NDF market. Korea has the highest share of NDF trading in the offshore market. Despite an open capital account, Korea limits non-residents from borrowing in won from banks within Korea, which explains the large NDF trading. The KRW NDF turnover increased between 2013 and 2016, and noted an even stronger growth of KRW spot and forward trading (see Table 2.1).

The Chinese Renminbi followed the third path, in which internationalisation occurs under capital controls. The Chinese authorities allowed, under the sphere of capital controls, an amount of offshore renminbi that can be freely traded (Zhang and Qiyuan, 2011). These restrictions demonstrate that the renminbi offshore market is immature, and that the renminbi is not a standard offshore currency. However, following the growth in the Hong Kong deposit

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[103] See the full article via Reuters, dated to March 17th 2014: https://www.reuters.com/article/russia-rouble-forwards/offshore-rouble-premium-rises-on-russia-sanction-jitters-idUSL6N0ME40720140317.

market, the forward market in the Chinese renminbi offshore market has become more liquid. The Chinese renminbi forward market is divided into three sections: the offshore NDF market, an onshore deliverable forward market, and an offshore deliverable forward market. Renminbi foreign exchange spot and derivatives transactions take place in offshore centres in Hong Kong, London, Singapore and New York (Funke et al. 2015). The Chinese Renminbi NDF trading share has declined sharply between 2011 and 2014. McCauley et al. (2014) noted that, prior to the reform of the onshore renminbi fixing instrument, the NDF trading was a concerning hedge, with a gap as wide as 2% between the settlement rate and the renminbi current trading level.

II.5 Korean Won onshore and offshore markets during the 2008/09 Financial Crisis[†]

The US dollar could not have achieved its international status without the support of the offshore market. The offshore market gives currencies the opportunity to perform their full potential as an international currency outside its jurisdiction. But to internationalise a currency by using the offshore market carries greater risk in order to manage potential risks to financial and monetary stability, thereby undermining the monetary authorities in conducting domestic policy and in managing capital flows. This is especially the case for emerging market economies, who are still not yet fully developed, and who face greater risks when they actively promote their currency through the offshore market.

The eruption of the global financial crisis in 2008/09 caused worldwide liquidity problems and especially hit Asian countries. This raised the question of how strong emerging market offshore currencies were affected, how they reacted, and how fast they recovered from the crisis. This question is particularly pressing for currencies that are undergoing an internationalisation process and are using the offshore market actively. This can be quantified with the offshore NDF market for currencies such as Chinese Yuan, Indian Rupee, Korean Won and the Taiwan Dollar who have grown the most. But with a daily transaction volume of up to US$ 500 million, the Korean won makes up the biggest Asian NDF market. Hence, it is highly possible that the reason for the depth and breadth of the Korean won NDF market are the efforts by the monetary authorities to process the currency internationalisation. Therefore, the Korean won represents

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[†] This chapter is based on Ghebrezghi (2018) with permission of Routledge Taylor & Francis.

the ideal case for examining the effect that a crisis can have on emerging market currencies who are undergoing a currency internationalisation and are actively using the offshore market.

South Korea has a high degree of capital market openness and a flexible exchange rate regime linked to FX funding markets, which has contributed to the high volatility of the won. Korea is the fifth largest exporter in the world and its GDP ranks eleventh in the world. However, the won is a volatile currency and it lacks international status. Hence, for foreign participants to make won-denominated investments, it is crucial for them to hedge against currency risks.

Before the financial crisis in 2007, South Korea enjoyed a surplus of its current account, and since 2004 banks had an average liquidity ratio which was 100% and higher. The amount of short-term external liabilities was dated in 2005 to be US$ 66 billion, and this widened to US$ 176 billion by the second quarter of 2008. There was a strong asymmetry in the private sector, because foreign assets were focussed on the monetary authority and foreign debts on the banking sector.[105] The access to the offshore market by foreign bank branches, which are the most important source of funds, provided a channel for domestic banks to obtain dollar funding, and this resulted in currency mismatches. This was mainly created through hedging services, as foreign bank branches used short-term external debt to offset long-term lending, so that there was a durational mismatch as well. Foreign bank branches obtained this currency-hedging through short-term borrowing in US dollars in the spot FX market, and passed it either in BOK bonds or directly to the Korean government. Thus, when banks accumulated external debt, the risk of currency mismatch increased. More and more banks were by this point dependent on sources of wholesale funding, which peaked at 24.9% of total funding by the end of June 2008 and then sharply declined.

The collapse of Lehman Brothers in September 2008 created a global financial panic. This eruption caused not only various market frictions in the Asian financial market but also worldwide liquidity problems. Korea faced an abrupt stoppage in capital flows, which hit the offshore market and forced foreign bank branches to convert won liquidity into US dollars. The cost for US dollar funding in the onshore market increased enormously, and foreign banks were not able to supply US dollars as easily and as extensively as they were able to do before the crisis. Not only that, the growing uncertainty triggered an outflow of foreign investors' funds and caused a liquidity contraction in the bond market. In addition, the sharp depreciation of the

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[105] See Appendix II.G: External Debts and Assets.

Korean won (by 24.5% in November 2008) forced foreign bank branches to liquidate their bond positions in order to obtain US dollars.

To regain financial stability and to fight against illiquidity, the BOK sharply eased its monetary policy through a cut in policy interest rates and by additionally providing an enormous amount of domestic liquidity. On October 29th 2008, the BOK signed a US$ 30 billion swap agreement with the Federal Reserve, and later that year engaged in a swap agreement with the People's Bank of China (PBC) of the price of 180 billion yuan/38 trillion won. At the same time, the BOK extended an existing swap agreement with the Bank of Japan (BOJ) to increase the circulating won/yen from US$ 3 billion to US$ 20 billion. Swap agreements emerged out of the financial crisis and helped to make the currency issued by one central bank that was available in the constituency to the other central banks with which the swap agreements were signed.

Table 2.2: Onshore less offshore foreign exchange forward premia[1]
Average of absolute value as a percentage of spot price, for three-month contracts (against the USD)

	Full Sample	Non-Crisis	Global Financial Crisis
CNY	0.43	0.41	0.59
INR	0.44	0.35	1.17
IDR	0.82	0.56	2.37
KRW	0.30	0.23	0.90
MYR	0.29	0.26	0.51
PHP	0.44	0.31	1.62
TWD	0.39	0.38	0.59
BRL	0.22	0.18	0.60

BRL=Brazilian Real; CNY=Chinese RMB; IDR=Indonesia rupiah; KRW=Korean won; MYR=Malaysian ringgit; PHP=Philipine Peso; RUB=Russian rouble; TWD=New Taiwan Dollar. [1] Daily Data for the forward premium gap are calculated as the difference between onshore forward and offshore NDF rates as a percentage of the spot price. Full Sample= January 2005 – December 2013. Global Financial Crisis = September 2008 – July 2009. Non-Crisis = Rest of the Sample. Sources: Bloomberg; CEIC; authors calculation.

Adapted from McCauley et al. (2014).

These actions gave non-residents the opportunity of purchasing Korean won NDFs and helped the exchange rate to move upwards by early 2009. In order to ensure sufficient liquidity in the money and bond markets, the BOK supplied a total of 18.5 trillion won through open market

operations.[106] As the effects of the global financial crisis from 2007/08 are still rippling, it is more important than ever to be informed about the dynamic relationship between the domestic and NDF markets for the process of currency internationalisation.

The rate differences contain important information, as they are affected by supply/demand conditions, market liquidity and expectations of future rates, uncertainty, speculation, and exchange regulations. These rate differences are recorded in Table 2.2, and show that the crisis in 2008 caused a widening between onshore and offshore rates across the Asian market. Furthermore, a gap between the deliverable forward and NDF rates reflects the effectiveness of a country's capital restrictions. Table 2.2 shows that during the global financial crisis this gap has been greatest for the Indonesian rupiah and the Philippine peso.

The remainder of this chapter contributes to the existing scholarly literature by studying how the financial crisis affected the interrelation and the information flow between the Korean won-dollar spot and its actively used offshore forward, the NDF market.[107]

II.5.1 The Korean won Offshore Market

As I already mentioned, the offshore market for the Korean won is the deepest and most liquid of Asian currencies.[108] The won is also one of the few currencies in which onshore participants are similarly important traders in the NDF market. The pricing of most forward foreign exchange contracts results mainly from the interest rate parity formula. Based on the spot and forward currency values and the interest rates between any two currencies, the interest rate parity formula measures the equivalent returns over a certain period. In addition to the interest rate parity, many other factors can affect the pricing of the NDF trading, such as trading flows, the expectation of changes in the exchange rate regime, uncertainty, or speculation. NDF prices

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[106] The aggregate credit ceiling was raised from 6.5 trillion won in November 2008 to 10 trillion won in March 2009.

[107] To the best of my knowledge, studies on the Korean won spot and offshore NDF market are limited.6 One of the reasons for this might relate to the difficulties there are in obtaining data of the offshore NDF market. However, there are a number of studies that cover the period of China's switches of exchange rate regime, and that assess how the NDF and spot market interacted (e.g., Huang and Wu (2006), Dai and Yang (2007), Xu, Li, and Zhang (2007), Kou and Kong (2013), Wang and Haier (2009)). These studies used different ranges of data and obtained contradictory outcomes.

[108] There is a high level of foreign participation in Korean equity markets, and a significant part of Korean public shares are owned by offshore investors.

can also be influenced by the condition of the domestic interest rate market or by the relationship between the onshore and offshore currency markets.[109]

When NDF and spot markets are segmented, which market is the one to move first and which consequently dominates the other market? Does the economic activity in one market affect the market that is its counterpart, even if this latter market is not directly involved? This event is also defined as a spillover effect which may have occurred during the Global Financial Crisis. However, to also measure risks in finance, volatility has been a standard tool, predominantly in the calculating of market risks. Most of the literature uses volatility to measure risks and concentrates on modelling volatility spillover.[110]

First, I will begin with the analysis of onshore and offshore interest rate differentials. The interrelation between the onshore spot and offshore NDF markets, can be drawn from the covered interest parity equation:

$$\text{NDF} = \text{St} \times (1 + i_t^{krw}) \ / \ (1 + i_t^{usd}) \qquad (2.3)$$

In this equation NDF denotes the non-deliverable forward exchange rate, St denotes the Korean won per US dollar spot exchange rate, and i_t^{krw} and i_t^{usd} denote the interest rates in Korea and in the U.S. respectively. This equation holds if the two markets are fully integrated. By computing the right-hand side of the equation and comparing it with the NDF rate, one is able to make a calculation if the covered interest parity holds. Figure 2.3 shows that, at the beginning of 2008, before the global financial crisis reached Korea, both markets comoved.

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[109] For instance, Brazil has an active traded onshore market which exceeds by far its offshore NDF market. Some investors offset trade in the onshore market, which might have a significant impact on NDF pricing.

[110] Thus, volatility spillover between markets has been a major topic in economics and financial studies. For instance, Misra et al. (2006) studied the volatility spillover between spot, NDF offshore and forward markets of the Indian rupee, and found a volatility spillover from the spot to the NDF offshore market and a volatility overflow in the other direction, but only to a lesser extent. A recent study by Yin (2016) found that the Chinese Renminbi (RMB) spot and forward markets are dominated by the offshore market but not in the reverse direction, and that the process of RMB internationalisation has caused the relation between the spot and NDF offshore markets to become more significant. Several studies also cover international spillover between financial stock markets. For example, King (1989), Theodossiou (1993), Chan-Lau et al. (2002), Yang et al. (2004) and Wu (2005) have all focussed on the volatility and mean spillover effects. Generally, they found that information transmission changed after the stock market crash in 1987 and that the U.S stock market transmits a significant mean and volatility spillover to other national markets.

Figure 2.3. Implied forward rate and the NDF rate

It can be seen that around 2008 the implied one-month forward rate and offshore NDF market rate fluctuated strongly. During the height of the crisis, the implied forward rate (IPF) had a high volatility. The NDF rate also spiked up prior to the crisis and had a standstill until the beginning of 2009. Any combination of reasons for this spike could include the lack of liquidity in the offshore market, investor uncertainty, and the high degree of volatility in the onshore market. Both markets started to co-move again in the beginning of 2009.

However, there are limits to the interpretation of the spread between IPF and the NDF rates. According to Frankel (1992) interpretation of the spread represents a useful tool for measuring international capital mobility. Hence, this study is motivated to analyse the dynamic interaction between the spot and NDF markets. The IPF rate reflects mixed information, as it includes the data of both markets. Therefore, the equation has to be rephrased, so as to represent the information from the onshore market after it has been separated from the offshore market. Thus, the equation, after being revised, will read as follows:

$$\text{NDF} \times (1 + i_t^{usd}) = \text{St} \times (1 + i_t^{krw}) \tag{2.4}$$

If the two markets are fully integrated, then equation (2.4) implies that the exchange rate-adjusted return in the offshore market Ft $\times (1 + i_t^{usd})$ is perfectly equal to the exchange rate-adjusted return in the onshore market St $\times (1 + i_t^{krw})$, and that there is no arbitrage opportunity left.[111]

II.5.2 Data

This subsection will now advance to focus on the interrelation between the onshore and offshore markets for the Korean won before and after the global financial crisis 2007/08. The employed dataset in this paper consists of the daily closing won-dollar NDF and spot rates.[112] The data cover a time frame from April 8th 2008 to December 31st 2012, which is an appropriate time-span with which to analyse the development of the measures undertaken by the BOK during the various stages of the financial crisis. Figure 2.4 plots the daily spot and NDF rates for 1, 3, 6, 9 and 12-month contracts respectively. By measuring which contract has the lowest spread between the forward bid and the ask prices divided by the spot rate, light can be shed on which NDF contract has the highest liquidity. The 3-month forward contract has the lowest spread and is the one referred to hereafter.[113]

After the collapse of Lehman Brothers in 2008, Korea's entire financial market fell into turmoil. The subsequent BOK policy response can be classified mainly as supplying liquidity, as well as involving financial and corporate restructuring. Korea's ratio of short-term foreign debt to reserves exceeded those of other emerging economies, which were also affected by the crisis.[114] In order to ensure a smooth functioning bond market, the BOK supplied 18.5 trillion won by means of open market operations. Additionally, the BOK signed currency swap agreements with the Federal Reserve (FED) of USD 30 billion, and later extended this swap agreement to China, Japan, Mexico, and Brazil. For banks that were experiencing especial difficulties, the BOK provided USD 26.6 billion in foreign currency liquidity.[115]

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[111] See Wan et al. (2014).

[112] NDF data has been obtained from Tullett Prebon (United Kingdom). The spot data is from the CEIC Database.

[113] The maturities of the Korean won NDFs are mainly less than one year, and the lowest spread of the NDF contract indicates a high liquidity and trading volume. See Ma et al. (2004) for further details.

[114] Korea had the sixth largest foreign reserves prior to the crisis. Their foreign reserves declined from USD 240 billion in September to USD 201 billion at the end of 2008. See further Cho (2010).

[115] See Appendix II.H: Liquidity Operations from the Bank of Korea.

In order to analyse how the liquidity operations from the BOK affected the interrelation of the offshore NDF and spot markets, it seems judicious to divide the time-range of the data into the periods before and after the measures of the BOK. The date of division within this timeline starts after the BOK signed their main liquidity agreements on December 15th 2008, and ends on December 31st 2012. This forms a timeframe that fully reflects the Korean won market into two zones of "before and after" the measures that the BOK took.

Figure 2.4.: Korean won spot and NDF rates
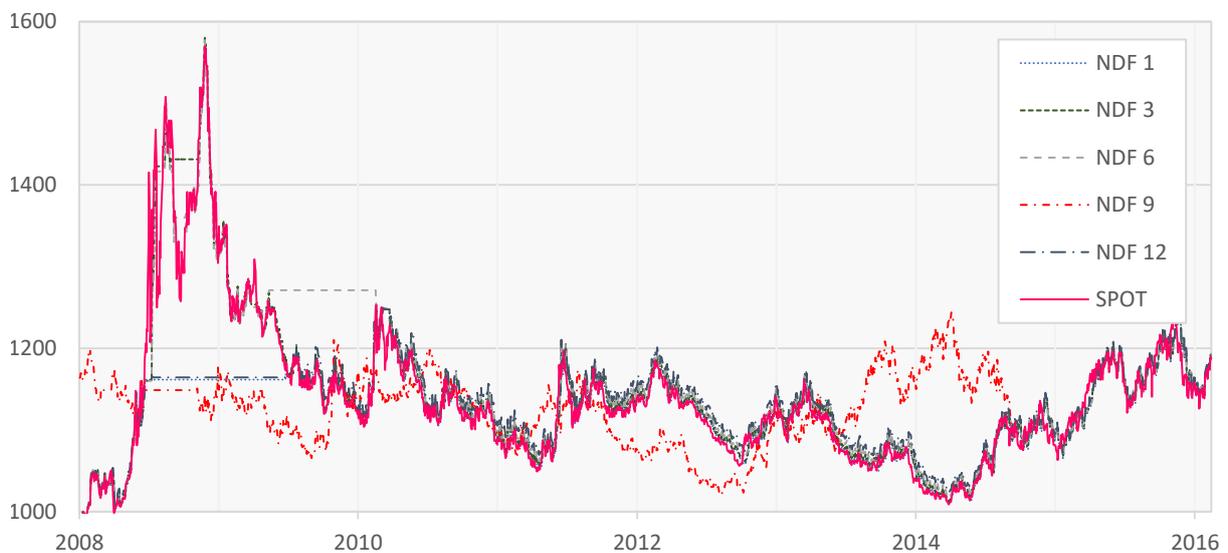
Note: Spot: Korean-won dollar spot exchange rate; NDF1: 1-month NDF rate, NDF3: 3-month NDF rate, and so on.

Source: Tullett Prebon and CEIC Database.

II.5.3 Methodology

The model building procedure used here is sequential and based on four steps, namely identification, specification, estimation and diagnostic checking. The first step requires a check for stationarity where the Augmented Dickey-Fuller test is applied. In order to provide evidence of the type of dependence, the next step involves testing for normality. For the purpose of diagnostic checking, the Ljung-Box test analyses serial correlation in the model residuals and their squares. The long-term relationship established between the onshore and offshore markets has been analysed by means of the Johansen cointegration test. Finally, the

concept of Granger Causality is employed to characterize the causal relationship between the time series. To examine the changes of the spot and offshore NDF markets of the Korean won, a MA(1)– GARCH(1,1) has been applied.

Let me begin with a brief review of the ARCH/ GARCH family of statistical models.

ARCH / GARCH model

Financial time series data usually show an indication of three common events, namely volatility clustering, leptokurtosis and the leverage effect, which refers to heteroskedasticity. To measure and analyse the changing effects of volatility within a time series, Engle (1982) proposed the autoregressive conditional heteroscedasticity (ARCH) model. The substance of the ARCH model is to use the variance of a stochastic time series as the autoregressive process. The reason for this is because the ARCH model relates the current level of volatility to the past squared errors. A simple ARCH process of pth order has the following form:

$$r_t = \mu_t + \epsilon_t$$

$$\sigma_t^2 = \omega_0 + \alpha_1 \epsilon_{t-1}^2 + \alpha_2 \epsilon_{t-2}^2 + \cdots + \alpha_p \epsilon_{t-p}^2$$

$$\epsilon_t = \sigma_t e_t$$

$$e_t \overset{i.i.d.}{\sim} N(0,1). \tag{2.5}$$

The model shows that the variance of the shock ϵ_t varies with respect to time and depends on the last squared errors $\alpha_1 \epsilon_{t-1}^2 + \alpha_2 \epsilon_{t-2}^2 + \cdots + \alpha_p \epsilon_{t-p}^2$. All variables on the right hand of σ_t^2 are known at time t-1. However, a weakness of the ARCH model is that problems arise when the number of parameters is not large enough to capture the conditional variance. Bollerslev (1986) therefore extended the model to include a generalized autoregressive conditional heteroskedasticity (GARCH), which states that the conditional variance depends not only on the squared error term of t-1 but also on the conditional variance in the previous period. The GARCH (p,q) model can be written in the following form:

$$r_t = \mu_t + \epsilon_t$$

$$\sigma_t^2 = \omega_0 + \sum_{p=1}^{P} a_p \epsilon_{t-p}^2 + \sum_{q=1}^{Q} \beta_q \sigma_{t-q}^2$$

$$\epsilon_t = \sigma_t e_t$$

80

$$e_t \overset{i.i.d.}{\sim} N(0,1). \hspace{5cm} (2.6)$$

The GARCH (p,q) model builds on the ARCH model but includes the conditional variance of previous time periods, $\sigma_{t-1}^2, \sigma_{t-2}^2,..., \sigma_{t-q}^2$. For the stability in modelling volatility, it is necessary that the coefficient of the lagged errors – namely the squared and lagged conditional variance – has to be a total of less than one. In fact, ARCH models are not often used for examining financial time series data, since a large number of lags is required for the process. Therefore, the GARCH model gives a better accuracy when capturing periods of volatility, which is the reason for its widespread acceptance. In financial time series it is essential to extract serial correlation, and as a result the Moving Average term (MA) is a useful tool and will be included in the examination. This final equation of MA (1)-GARCH (1,1) takes the following form:

$$R_{it} = a_i + \delta_i \varepsilon_{i,t-1} + \varepsilon_{it}$$

$$\sigma_{it}^2 = \omega_{0i} + \alpha_{1i} \varepsilon_{i,t-1}^2 + \beta_{1i} \sigma_{i,t-1}^2 \hspace{3cm} (2.7)$$

In these two equations the reaction parameter ARCH is defined by α_1 and β_1, which belongs to the GARCH persistence parameter, while the coefficient δ belongs to the MA (1) term. R_{it} represents the changes between the onshore and offshore markets during the period t, and σ_{it}^2 is the conditional variance of R_{it}.

Spillovers

The use of ARCH-type models to study the mean and volatility spillover in currency markets has been applied by Park (2001), Behera (2011), Hasan et al. (2016) and Cadarajat et al. (2012). As well as these studies, Hamao et al. (1990) examined spillovers in the conditional mean and volatility across stock markets by using an ARCH model, including exogenous variables from the counterpart market. ARCH-type models assume that the conditional error is serially uncorrelated. In financial time series it is essential to extract serial correlation, and as a result the Moving Average term (MA) is a useful tool and will be included. This study follows the Hamao-Masulis-Ng (1990) specification for testing spillover effects by employing a first order moving average generalized ARCH model, MA(1)–GARCH(1,1), which has the following form:

$$r_{it} = a_i + \tau_i r_{j,t-1} + \delta_i \varepsilon_{i,t-1} + \varepsilon_{it}, \qquad (2.8)$$

$$\sigma_{it}^2 = \omega_{0i} + \alpha_{1i}\varepsilon_{i,t-1}^2 + \beta_{1i}\sigma_{i,t-1}^2 + \rho_i \varepsilon_{j,t-1}^2, \qquad (2.9)$$

In these two equations the reaction parameter ARCH is defined by α_1 and β_1, which belongs to the GARCH persistence parameter, while the coefficient δ belongs to the MA (1) term. Hence r_{it} represents the changes between the onshore and offshore markets during the period t, and σ_{it}^2 is the conditional variance of r_{it}. The exogenous variables τ_i and ρ_i focus on the spillover effects from market j to i in the conditional mean and volatility.

II.5.3 Preliminary Results

For a financial time series analysis, it is necessary to have stationarity. For this purpose, the Augmented Dickey Fuller tests the null hypotheses in which a unit root is present in a time series sample. The results in Table 2.3 printed below showed that the spot and NDF rates are non-stationary in log levels but stationary in first differences. Consequently, for the following analysis, this study uses the percentage changes in the spot and the NDF markets.[116]

Table 2.3: Augmented Dickey Fuller Test

Variable	Critical Value	T-statistics	First difference
Overall			
SPOT	-3.43 (1%)	-3.1438	-11.523
NDF	-3.43 (1%)	-3.3319	-12.075
Pre-financial crisis			
SPOT	-3.46 (1%)	-0.3232	-6.9287
NDF	-3.46 (1%)	-0.2895	-5.5188
Post-financial crisis			
SPOT	-3.43 (1%)	-2.6456	-12.156
NDF	-3.43 (1%)	-2.6667	-11.636

The outcome of the descriptive statistics for the NDF and spot rate were presented in Table 2.4. There is a negative mean after the financial crisis but not prior to it, and not in the full sample. The standard deviation was much higher prior to the financial crisis and declined notably in the aftermath of the crisis, which indicates that, during the run up to the financial crisis, the

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[116] Except for the cointegration test.

uncertainty around the won led to a high volatility in the spot and NDF markets. Nevertheless, volatility declined by more than half in the post-crisis period. This may indicate that the BOK efforts to stabilize the won worked effectively. The preliminary analysis also presents the shape of the distribution for the spot and NDF rate in Table 2.4 below. The data are skewed and leptokurtic.

The outcome of the Jarque-Bera test rejects the null hypothesis and therefore implies a non-normal distribution. Table 2.4 also exhibited the result of the Ljung-Box Q statistics for serial correlation and their squared series for up to 10 lags.

Table 2.4: Descriptive Statistics

Variable	Mean (x10^3)	Standard Deviation	Skeweness	Kurtosis	J-B statistic	Ljung-Box Q (10)	Ljung-Box Q^2 (10)
Overall							
ΔSPOT	0.1765	0.012	-0.5827049	24.76791	25066 (0.000)	42.317 (0.000)	365.93 (0.000)
ΔNDF	0.1763	0.008	1.005061	12.78171	6828 (0.000)	28.522 (0.000)	110.38 (0.000)
Pre-financial crisis							
ΔSPOT	1.8032	0.0210	0.8358757	12.54073	1227.2 (0.000)	27.421 (0.002)	53.842 (0.000)
ΔNDF	2.1288	0.0107	2.5576666	18.9357	2943 (0.000)	20.709 (0.023)	18.355 (0.041)
Post-financial crisis							
ΔSPOT	-0.1896	0.0087	0.1578568	3.389574	387.52 (0.000)	17.382 (0.000)	201.25 (0.000)
ΔNDF	-0.2632	0.0080	0.02838385	5.629138	1057.9 (0.000)	30.732 (0.000)	148.33 (0.000)

Note: The J-B statistic is the Jarque-Bera test for normal distribution, while the numbers in parentheses are the p-values. The Ljung-Box Q(10) and Ljung-Box Q^2(10) statistics is the test for serial correlation of the spot and NDF rate changes and their squared series. The null hypothesis tests that all serial correlations are zero. P-values are in parentheses.

The L-B $Q(10)$ and the squared L-B $Q^2(10)$ results are all statistically significant and indicate the presence of serial correlation. This suggests the presence of autoregressive conditional heteroskedasticity (i.e. volatility clustering) and justifies the use of a model from the ARCH family to capture the presence of ARCH effects.

II.5.4 Empirical Results

Cointegration and Granger Causality test

Nonstationary time series cannot be used in regression models, as they may create spurious regression. However, two or more variables might still be nonstationary series even though in actual fact they do not stray too far from each other, so that in the long term they return to their equilibrium relationship. The cointegration test determines whether two (or more) nonstationary variables have a stable long-term relationship. Following the Johansen method, Table 2.5 presents the result that the test statistics of no cointegration is greater than both critical values. This means that, despite the havoc of the financial crisis and the injurious effects it had on the Korean won onshore and offshore markets, the crisis did not cause any deviations in the equilibrium return in the long run. The results also imply that the Korean won recovered quickly from the aftermath of the financial crisis, as is further indicated in Table 2.5:

Table 2.5 Johansen Cointegration

Hypothesized number of CE	Eigenvalue	Trace Statistic	5% Critical Value	1% Critical Value
Overall				
None	0.1109	110.15	15.67	20.20
At most 1	0.0004	4.22	9.24	12.97
Pre-financial crisis				
None	0.1133	32.94	25.32	30.45
At most 1	0.0171	3.01	12.25	16.26
Post-financial crisis				
None	0.0415	39.44	25.32	30.45
At most 1	0.0074	5.92	12.25	16.26

Note: CE means cointegration equation. Testing the hypothesis of no cointegration is represented as "none". The hypothesis that both series are stationary is shown as "at most 1".

According to Engle and Granger (1987), when variables are cointegrated, a further implication is that there must exist causality between the different time series. Therefore, the following analysis addresses (causal) relationships among the NDF and spot rates. The rejection of the null hypotheses implies Granger causality. Table 2.6 presents, in the form of vector autoregressive representation of two variables, the results of the Granger causality test. The results display a bi-directional causality between the spot and NDF rates prior to the global financial crisis, although the effect of the offshore market on the onshore market has a lower significance than the effect the other way around.

Table 2.6 Granger causality

Null Hypothesis	F-statistic	P-value
Overall		
SPOT does not Granger-cause NDF	12.449	0.00
NDF does not Granger-cause SPOT	2.5586	0.00
Pre-financial crisis		
SPOT does not Granger-cause NDF	9.9524	0.00
NDF does not Granger-cause SPOT	2.369	0.02
Post-financial crisis		
SPOT does not Granger-cause NDF	0.9994	0.44
NDF does not Granger-cause SPOT	1.3468	0.20

Note: Based on the information criteria of Akaike (AIC) the optimal lag length is three (3).

This is different from the result of the relationship in the aftermath of the crisis. Neither the spot market to the offshore NDF market nor the NDF offshore market to the spot market show any signs of Granger causality. This means that the responses between the spot and NDF rates are zero, or, in other words, any event that occurred in one of the markets has no effect (i.e. does not Granger-cause) upon the counterpart. Rather, the preliminary analysis indicated the presence of significant autocorrelation and strong conditional heteroskedasticity.

Based on the existing literature, a Generalized Autoregressive Conditional Heteroskedastic (GARCH) model will be used to capture these effects. After several tests were carried out with different models using likelihood ratio statistics, it was concluded that the MA(1)–GARCH(1,1) model has the most parsimonious fit to the data. ARCH-type models assume that the conditional error is serially uncorrelated and the MA(1) term has to be included, since it is necessary that serial correlation is extracted from the NDF and spot daily closing rate. The outcome of the MA(1)–GARCH(1,1) is presented in Table 2.7.

Table 2.7 MA (1)–GARCH (1,1)

$$R_{it} = a_i + \delta_i \varepsilon_{i,t-1} + \varepsilon_{it}; \; \sigma_{it}^2 = \omega_{oi} + \alpha_{1i}\varepsilon_{i,t-1}^2 + \beta_{1i}\sigma_{i,t-1}^2$$

Variable	Coefficients						
	a_i	δi	ω	α_1	β_1	Ljung-Box Q (10)	Ljung-Box Q^2 (10)
Overall							
ΔSpot	-0.0002	-0.0106	1.717e-06	0.1194	0.8667	10.12141	9.062556
	(-0.940)	(-0.295)	(3.231)	(6.370)	(48.05)	[0.43]	[0.53]
ΔNDF	-0.0002	0.0246	1.156e-05	0.3324	0.5674	8.063787	2.039527
	(-1.071)	(0.599)	(6.542)	(6.575)	(14.188)	[0.62]	[0.99]
Pre-financial crisis							
ΔSpot	0.0009	0.2357	5.101e-06	0.3579	0.6352	11.49583	2.981625
	(1.320)	(2.902)	(1.863)	(2.526)	(5.715)	[0.32]	[0.98]
ΔNDF	0.0004	0.2569	1.728e-05	0.3914	0.6019	5.757092	5.718505
	(0.641)	(3.139)	(4.022)	(5.261)	(2.662)	[0.83]	[0.83]
Post-financial crisis							
ΔSpot	-0.0003	-0.0682	1.238e-06	0.0794	0.9020	14.49791	17.29471
	(-1.777)	(-1.777)	(2.874)	(5.417)	(59.525)	[0.15]	[0.07]
ΔNDF	-0.0004	-0.0933	2.935e-06	0.1159	0.8409	9.757	9.150816
	(-1.793)	(-2.276)	(3.245)	(5.480)	(30.00)	[0.46]	[0.52]

Note: Figures in parentheses are t-statistics which show the significance of the coefficients. The Ljung-Box Q(10) and Ljung-Box Q^2(10) statistics test for serial correlations for up to 10 lags. The null hypothesis is that all serial correlations are zero (0). P-values are in parentheses.

The Ljung-Box $Q(10)$ and $Q^2(10)$ statistics for the normalized GARCH residuals and their squared residuals show no significance, which indicates that the estimated model fits the data well. The coefficient δ of the MA(1) term is highly significant but only before the financial crisis broke out. This high significance of the MA(1) term shows that previous shocks played a vital role in determining the current spot and NDF markets rate.

All the parameters in the variance equation ω, a_1, β_1 are highly significant. The coefficient a_1 is lower than β_1, which shows that the spot and NDF rates are more affected by past volatility. The sum of the ARCH and GARCH coefficients, a_1 and β_1, measures the persistence of volatility: if the results are close to 1, then shocks to volatility will be more persistent and the conditional variance will take a long time to converge to its steady state. It appears that, for all samples, the GARCH and ARCH parameters are close to 1, indicating that the spot and the NDF rates have both attributes, namely volatility clustering and persistence.

Table 2.8: Mean and Volatility Spillover

$$r_{i,t} = a_{i,t} + \tau_i r_{j,t-1} + \delta_i \varepsilon_{i,t-1} + \varepsilon_{i,t}; \; \sigma_{it}^2 = \omega_{0i} + \alpha_{1i}\varepsilon_{i,t-1}^2 + \beta_{1i}\sigma_{i,t-1}^2 + \rho_i \varepsilon_{j,t-1}^2$$

Variable	Coefficients						
	a_i	δ	τ	ω_0	α_{1i}	β_1	ρ_i
Overall							
$r_{j,t}$ = Δ Spot	0.000019	-0.024728	-0.000309	0.00000	0.000000	0.052042	0.705943
$r_{i,t}$ = Δ NDF	(59.99)	(-144.001)	(-7.544)	(NA)	(0.052042)	(1200.58)	(1018.83)
$r_{i,t}$ = Δ NDF	-0.000179	-0.028287	0.100735	0.00000	0.122789	0.865685	0.00000
$r_{j,t}$ = Δ Spot	(-8.46e-01)	(-7.799e-01)	(2.7692)	(NA)	(8.0730)	(1.1508)	(6.00e06)
Pre-financial crisis							
$r_{j,t}$ = Δ Spot	0.000005	0.275059	0.000027	0.00000	0.611018	0.008094	0.384335
$r_{i,t}$ = Δ NDF	(15.038)	(3867.246)	(11.93)	(NA)	(3609.272)	(2700.156)	(3441.553)
$r_{i,t}$ = Δ NDF	0.000874	0.243342	0.027556	0.00000	0.309429	0.677673	0.000000
$r_{j,t}$ = Δ Spot	(1.3265)	(5.1960)	(0.43589)	(NA)	(2.31600)	(4.9905)	(1.3000e-05)
Post-financial crisis							
$r_{j,t}$ = Δ Spot	-0.000359	-0.108918	0.104992	0.00000	0.121165	0.832602	0.000000
$r_{i,t}$ = Δ NDF	(-1.74766)	(-2.561748)	(3.49024)	(NA)	(13.60742)	(59.7577)	(0.000003)
$r_{i,t}$ = Δ NDF	-0.000262	-0.088718	0.126353	0.00000	0.085401	0.898966	0.000000
$r_{j,t}$ = Δ Spot	(-1.3295)	(-2.2517)	(2.9034)	(NA)	(1.7810)	(1.1559)	(2.5000e-05)

Note: Figures in parentheses are t-statistics that test the significance of the coefficients.

Hence, the MA(1)–GARCH(1,1) model gives the impression of capturing volatility clustering of the data quite well. In order to analyse the directions of information transmission and the changing patterns, this study follows Hamao et al. (1990) and incorporates the spillover effects into the GARCH model. The model for the mean and volatility spillover includes the squared residual, which was derived from the MA(1)–GARCH (1,1) model and which was introduced into the conditional variance as an exogenous variable. This is presented in Table 2.8:

As shown in equations (3) and (4), the exogenous variable $r_{j,t-1}$ shows the exchange rate changes from the respective market on the previous trading day. The variable $\varepsilon_{j,t-1}^2$ represents the previous day's squared error from the MA(1)–GARCH(1,1), as applied to the variable r_j. The coefficient (τ_i) of $r_{j,t-1}$ indicates the spillover of market j on the conditional mean in market i, and the coefficient (ρ_i) of $\varepsilon_{j,t-1}^2$ indicates the volatility spillover of market j on market i. The estimation and test results are presented below in Table 2.8. Before the financial crisis broke out, there was a mean and volatility spillover from the spot to the NDF market, but not the other way around. This result suggests that past rate changes and innovations in the domestic spot market influenced the conditional mean and variance of the rate changes in the

NDF market. It further indicates that the BOK was able to carry out an independent monetary policy.

Prior to the crisis, South Korea's current account had a surplus of high reserve assets and a low perceived liquidity risk, which might explain why the information transmission did not occur from the NDF to the spot market. Foreign factors did not influence the domestic market despite the fact that hedge ratios had increased prior to the crisis. Generally, financial markets perceived South Korean authorities as being more responsive to market forces when a depreciation was expected.

This was the case in the run-up to the financial crisis, at a time when expectations of a trend appreciation in the won led to an imbalance between the domestic market and the NDF market. After the policy response taken by the BOK, the spillovers that emerged in the pre-crisis disappeared. Neither the mean nor volatility spillovers show any noticeable transmission between the onshore and offshore markets. This result suggests that the intervention of the BOK to balance the rapid capital outflows helped successfully to diminish the mean and volatility spillovers that existed prior to the crisis from the spot to the NDF market.

II.6 Summary and Conclusions

This chapter began by examining the history of offshore markets before turning to the Japanese yen, Chinese renminbi, and Korean won as three examples. Regulation is the key factor that drives the development of offshore markets, as has been clearly stated in recent years by He and McCauley (2010). The Eurodollar market emerged as a reaction to capital controls in the U.S. The experience of the Japanese yen shows that the process of currency internationalisation is a consequence of a currency's credibility, stability, financial depth, and openness. Nowadays, the offshore market, and particularly the NDF market, remains an important instrument for the circulation of a currency outside its jurisdiction, particularly for emerging markets. It also benefits investors by giving them the chance to hedge against exposures and provide them with better returns at lower transaction costs.

Moreover, it facilitates diversification when it comes to currency risks for both investors and borrowers, and it adds liquidity, depth, and breadth to the foreign exchange market which consequently enhances the usage of a currency. However, some countries want to regulate

offshore because of its destabilizing influences and to preserve control over the onshore market. Controlling offshore trading gives monetary authorities the ability to conduct an effective monetary policy, without undermining the stability of their exchange rates. The exchange rates of emerging markets are in general affected by global conditions and therefore the impact for the offshore market is likely to be bigger, since the offshore market is more connected with the global financial market. Also, the literature (such as Park (2001) and Colavecchio and Funke (2006)) agrees that there are interlinkages between the onshore and the NDF offshore markets, and it is therefore important for policy makers to understand the character of the NDF market and how it impacts the onshore market.

To this end, the second half of this chapter turned to address how the policy response by means of loans and open market operations, which were adopted by the BOK, affected the progress of currency internationalisation by its usage in the offshore NDF markets both before and after the financial crisis. The specific response of the Korean monetary authority can be classified into two main categories: first, the sharp expansion of liquidity supply to mitigate a credit crunch and to recapitalise the banking sector, and second, the restructuring of the financial institutions. The findings of this empirical analysis have several implications. Generally, there exists a long-term relationship between the NDF and spot markets, which indicates that the financial crisis caused no more than a short-term disruption in the spot and offshore NDF markets. However, the test results in the pre-crisis period present a slightly different outcome, by showing that there exists a bi-directional causality between the spot and NDF markets. On the other hand, Table 2.8 presented only a mean and volatility spillover from the spot to the NDF market. A possible explanation for this inconsistency may be due to the fact that the MA(1)–GARCH(1,1) model has a stricter test statistic when compared to the Granger causality.

The collapse of Lehman Brothers and the actions taken by the BOK changed the whole banking environment in 2008. The financial and foreign exchange market stabilised, an outcome which might explain the narrowed gap between the spot and offshore NDF markets. The outcome in Table 2.8 shows that the mean and volatility spillover between the domestic spot and NDF markets has faded profoundly to establish a better and greater balance, since neither the spot nor the offshore NDF market now act as a major market for price discovery. On the whole, the outcome of these findings supports the Korean account of a rapid and successful recovery in the health of its financial markets. The BOK made a timely and effective monetary policy response to contain foreign exchange market turbulence at an early stage

This outcome is also consistent with other studies regarding the timely and effective response taken by the BOK (see OECD Economic Surveys: Korea (2010), Kim (2009), Cho (2010), Chung, 2011). Moreover, the outcome of our study does not reflect the general post-crisis condition of Korea's financial market. To exemplify this, Shin et al. (2015) studied the liquidity and credit risk of the Korean corporate bond market both before and after the global financial crisis. They found that investors require a higher default-risk premium in the post-crisis period, which reflects the increased uncertainty in the Korean financial market. Not every emerging market with an active offshore market has similar outcomes after a financial crisis. For instance, the Indian Rupee spot and the offshore NDF market had an altogether different experience. Cadarajat et al. (2012) investigated the information spillover between the spot and NDF markets of the Indian Rupee (IDR), during the period of the sub-prime crisis and the European sovereign crisis. They found, by contrast, that during the whole period there was a volatility spillover from the NDF to the spot market.

These results also show that emerging market economies can actively use the offshore market for currency internationalisation, but they need the policy options to manage the risks to financial and monetary stability that comes with circulating the currency outside their jurisdiction. A developed offshore market is essential for the internationalisation of a currency, and to this day the Korean won has the largest offshore NDF market, but its international usage is still insignificant, even within Asia. In Korea around 80% of imports and exports are still denominated in US dollars. This shows that the offshore NDF market might contribute to the internationalisation process of a currency, but it does not generate an international currency. NDF play an essential role for market participants to hedge against currency risks. This encourages marker participants in trading with counterparties in countries who were constrained by capital restrictions and by the absenteeism of a forward foreign exchange market. Therefore, for countries who want to still exercise capital controls but want to encourage businesses, the NDF is the key instrument. But in the case of promoting an international currency, there are more factors required than just NDF trading in the offshore market, as I showed earlier in the first chapter of this dissertation. The Korean won does not fulfil the requirements for becoming an international currency. However, it may maximise its potential benefit as a regional currency.

Appendix

II.A One Country, Two systems

Figure 2.A Chinas Onshore and Offshore Market
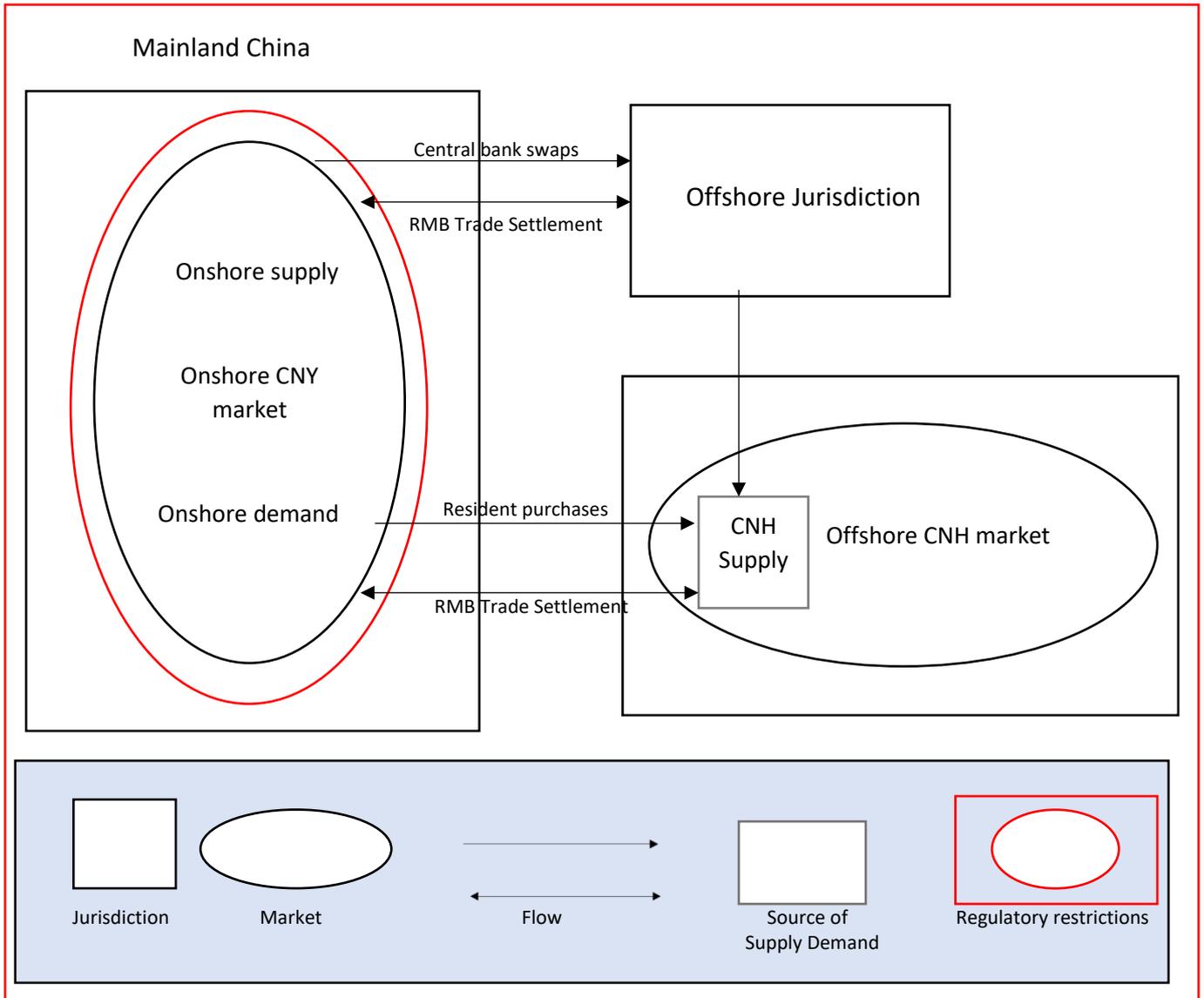
The Figure reflects the onshore and offshore market of the Chinese renminbi. The regulation of Renminbi has parted the onshore and offshore market and therefore the Renminbi is traded in both markets, but at different rates. The offshore CNH market has been important in Chinas effort for the internationalisation of the Renminbi while keeping the domestic market isolated from international markets.

II.B The Eurodollar market

Figure 2.B Internal Structure of the Eurodollar market
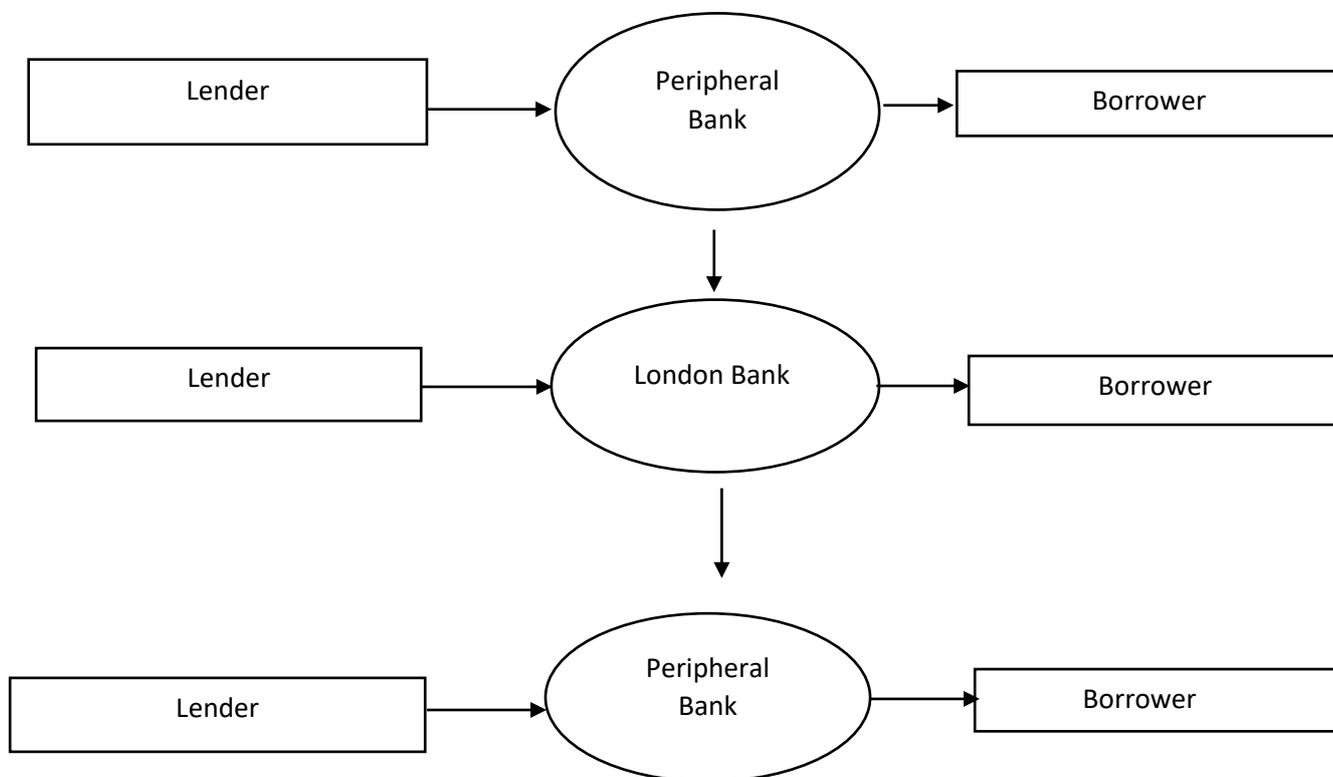
Source: Niehans and Hewes (1976).

II.C The case of the U.S. dollar

Historians state that invoicing in British pounds represented roughly 60 per cent of the world's trade by the late nineteenth century. Two-thirds of foreign exchange reserves were kept in pounds in 1899, which was more than twice than their then direct competitors, the French Franc and German Mark. The Dollar played no role in the foreign exchange reserves at all (Frankel, 2011). This somewhat changed in 1917, when the dollar emerged as an international currency and when it was pushed through the establishment of the central bank, the Federal Reserve. The launching of the central bank then gave a great push in support of the international use of the dollar, accounting for its depth, liquidity and the openness of the financial market

(Eichengreen (2008; 2011). The Fed was able to establish the U.S dollar as a credible currency and as a source of reliable credits; and so, as the financial market developed globally further, so did the US dollar. The continuation of World War I for another year helped to prolong and intensify lending by the U.S. to the U.K., which strengthened the dollar as a strong and credible currency (Frankel, 2011). The Bank of England also took steps to combat the U.S dollar and to gain ground again. In light of World War I, the Sterling was able to regain ground, and sterling reserves expanded again.

Eichengreen and Flandreau (2008) argued in this connection that the U.S dollar first dethroned the British pound as an international currency as early as the middle of the 1920s. This would mean that there was a lag of 10 years until the time when the US economy overtook the UK.[117] It is important to note that the rise of the U.S dollar as an international currency was market-driven and was not a primary goal by the Fed or by politicians (Frankel, 2011). The law that had been created in 1907 due to the financial shock was motivated to boost the dollar's international standing (Karmin, 2008). Another crucial step that boosted the global status of the dollar was the thriving offshore U.S. dollar market, e.g. conducted in the form of Eurodollars. He et al. (2010) argued that the major use of international currencies takes place in the offshore market, especially in international financial centres. They argued that without the Eurodollar market the dollar would not have gained its role as a leading international currency. There were several issues that contributed to the growth of the Eurodollar market.

For one thing, the U.S. dollar offshore market was free of regulation. This allowed banks to operate with low transaction costs compared with banks in the U.S., which meant that offshore banks were effectively competing with banks operative in the onshore market. There was no regulation for interest payable in Eurodollar deposits or loans. Also, banks in the offshore market were not required to hold noninterest-bearing reserves as opposed to the Eurodollar deposits; rather, these banks held balances with U.S banks for clearing purposes only (Frankel, 2011). This form of soft regulation was a key factor in the development of the offshore market for the U.S. dollar. However, He and McCauley (2010) argued that the rapid development of the U.S. dollar offshore market was additionally a result of capital controls in the U.S domestic market, especially following the interest equalization tax of 1963. And yet, while the U.S. authority set the capital controls, they never restricted the flow of payment through U.S banks,

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[117] See for more Eichengreen and Flandreau (2010).

to allow the settlement of offshore trade and investment transactions so that the offshore market would still be open and actively used.

The U.S. experience shows that a thriving offshore market is a key factor for the internationalisation of a domestic currency. In light of China's effort to internationalise the Renminbi, it is crucial that regulation must be eased to allow offshore banks to access the Renminbi onshore market.

II.D Bilateral swap agreements with the PBOC

Table 2.9 Bilateral swap agreements with the PBOC, 2008-2015.

Economy	Date	Amount (CNY billions)	Economy	Date	Amount
Republic of Korea	Dec, 12, 2008 Oct, 26, 2011	180 360	Albania	Sep 12, 2013	2
Hong Kong, China	Jan, 20, 2009 Nov, 22, 2011	200 400	European Union	Oct 9, 2013	350
Malaysia	Feb, 8, 2009 Feb, 8, 2012	80 180	Switzerland	Jul 21, 2014	150
Belarus	Mar, 11, 2009	20	Sri Lanka	Sep 16, 2014	10
Indonesia	Mar, 23, 2009	100	Qatar	Nov 3, 2014	35
Argentina	Apr, 2, 2009	70	Canada	Nov 8, 2014	200
Iceland	Jun, 2010	3.5	Suriname	Mar 18, 2015	1
Singapore	Jul, 23, 2010 Mar, 7, 2013	150 300	United Kingdom	Jun 22, 2013	200
New Zealand	Apr, 18, 2011	25	Hungary	Sep 9, 2013	10
Uzbekistan	Apr 19, 2011	0.7	Albania	Sep 12, 2013	2
Kazakhstan	Jun 13, 2011	7	European Union	Oct 9, 2013	350
Thailand	Dec 22, 2011	70	Switzerland	Jul 21, 2014	150
Pakistan	Dec 23, 2011	10	Sri Lanka	Sep 16, 2014	10
United Arab Emirates	Jan 17, 2012	35	Qatar	Nov 3, 2014	35
Turkey	Feb 21, 2012	10	Canada	Nov 8, 2014	200
Australia	Mar 22, 2012	200	Suriname	Mar 18, 2015	1
Ukraine	Jun 26, 2012	15	South Africa	Apr 10, 2015	30
Brazil	Mar 26, 2013	190	Chile	May 25, 2015	22
United Kingdom	Jun 22, 2013	200	Tajikstan	Sep 5, 2015	3.2
Hungary	Sep 9, 2013	10	Total		3,164

Source: People's Bank of China

II.E Example for an NDF contract

Figure 2.C12 Brazilian Real NDF contract

1. Investment

- An investment will be conducted in Brazil
- The Investors will invest in US Dollar
- The investor will receive 500.000 BRL in 6 month for the investment
- The current FX rate is USDBRL 4.00

2. Risk

- The BRL is a volatile currency exposed to risk.
- The Investor wants to hedge his investment against FX exposure.

3. NDF Contract

- With an NDF contract the investor agrees to buy 6-month USDBRL
- The contract implies to buy USD and sell BRL 500.000 BRL at 4.00

4. Settlement Date

- 6 month later the settlement currency, USD, has appreciated against the BRL to 5.00
- With the NDF contract, the investor receives the difference of BRL 5.00-BRL 4.00*notional value.
- The investor receives the difference in USD.

Source: Own Figure.

II.F Key impediments in Asian markets

Table 2.10 Accessibility, Taxation, Funding, Hedging.

	CHINA	HONG KONG SAR	KOREA	INDIA	INDONESIA	MALAYSIA	PHILIPPINES	SINGAPORE	THAILAND
HOLDING AND BUYING LOCAL BONDS	Limited	Yes	Yes	Limited	Yes	Yes	Custodian	Yes	Limited
NON-RESIDENT ACCESS	Via QFII	Yes	Yes	Via FII	Yes	Yes	Yes	Yes	Yes
FX RESTRICTIONS	Yes	No	No	Yes	Yes	Very Few	Yes	No	Yes
WITHHOLDING TAX (NON-RESIDENTS)	Only Corp	No	Yes	Yes	Yes	No	Yes	No	Only Corp
CAPITAL GAINS (NON-RESIDENTS)	No	No	Yes	Yes	Only Corp	No	Only Corp	No	Only Corp
FUNDING / HEDGING INSTRUMENTS									
DEVELOPED REPO MARKETS	Yes	Yes	Yes	Yes	Limited	Yes	No	Yes	Limited
OTC INSTRUMENTS									
IRS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FX SWAPS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
FX FORWARDS	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
EXCHANGE TRADED INSTRUMENTS									
IR FUTURES	No	Yes	Yes	No	No	Yes	No	Yes	No
FX FUTURES	No	No	Yes	No	No	No	No	No	No
LIQUID NDF MARKET	Yes	No	Yes	Yes	Moderate	Moderate	Moderate	No	No
UP TO 12 MONTHS	Yes	-	Yes	Yes	Moderate	-	Moderate	-	-
UP TO 5 YEARS	Limited	-	Yes	Moderate	Illiquid	-	Limited	-	-

FX=Foreign Exchange; OTC=Over the Counter; IRS=Interest Rate Swaps; IR=Interest Rate; NDF=Non-Deliverable Forward;FII=Foreign Institutional Investor; QFII=Qualified Foreign Institutional Investor. Sources: Barclays Capital, JPMorgan, Deloitte Touche, Price Waterhouse Coopers, BIS, WFE. Asianbondsonline.com, National Surveys.

Adapted from Goswami and Sharma (2011).

II.G External Debts and Assets in Korea

Table 2.11 External Debts and Assets (in US dollar billions)

	2005	2006	2007	2008: Q2	2008	2009
External Debt	187.9	260.1	382.2	419.8	381.3	369.3
(short term)	(65.9)	(113.7)	(160.3)	(176.2)	(151.1)	(148.1)
Banks	83.4	136.5	194.0	210.5	171.7	161.9
(short term)	(51.3)	(96.1)	(134.0)	(146.7)	(113.0)	(103.8)
External Asset	308.6	366.7	417.7	422.5	348.2	345.5
(short-term)	(212.4)	(242.8)	(266.3)	(261.8)	(279.6)	(278.8)
Banks	53.0	63.2	76.4	84.5	83.0	77.3
(short-term)	(39.0)	(39.9)	(45.5)	(51.9)	(52.4)	(47.2)

Source: Kim 2009, Bank of Korea.

II.H Liquidity Operations from the Bank of Korea

Table 2.12 Liquidity Operations from the Bank of Korea (until March 2009).

	Amount
Open market operations, including repo purchases	18.5
Increase in aggregate credit ceiling loans	3.5
Payment of interest on reserves	0.5
Support for the Bond Market Stabilisation Fund	2.1
Support for the Bank Recapitalisation Fund	3.3
Contributions to the Korea Credit Guarantee Fund	0.1
Total	28.0

Source: Bank of Korea.

"Between the idea. And the reality. Between the motion. And the act. Falls the Shadow."

[T.S. Eliot]

CHAPTER III

DESTABILIZING CAPITAL MOVEMENTS IN GERMANY

III.1 Introduction

Many countries, but mainly emerging markets, have bolstered their resiliency against liquidity crises, since they want to extend their efforts to re-establish reliability in their macroeconomic and financial systems. This is particularly seen to be the case with regulations that are designed to decrease transactions in the domestic currency outside its borders, or in other words to protect against the internationalisation of the currency. For instance, after the set of Asian crises, countries in the region better understood that offshore transactions actually caused exchange rates to fall and increased exchange rate volatility. Regulations and monitoring have benefits, but these benefits also come with additional costs, and balancing the costs and the benefits is a major challenge for many countries, such as Germany's former currency – the Deutsche Mark.

The importance of a stable currency in Germany has been, since the original introduction of the Deutsche Mark, a major priority of the policy of the Bundesbank. The beginning of this history can be set with the Bretton Woods (1945-1973) agreement that became functional after nearly 15 years in 1958, when the Deutsche Mark and several other European currencies declared current account convertibility. The Bundesbank was now required to sell Deutsche Marks whenever the intervention point with the dollar was reached. Such an obligatory

increased reserves in the banking system and expanded the money supply, which created inflation. Subsequently, capital inflow, under the fixed exchange rate system, became a significant threat to the Bundesbank's goal of maintaining price stability.

The case of Germany is of particular interest, sine the Deutsche Mark became the second most important currency after the dollar prior to its absorption into the Euro. This occurred without any proactive effort on the part of the Bundesbank or the Federal Government to do much by way of promoting internationalisation. But between the 1960s and the early 1980s, the Bundesbank limited the international use of the Deutsche Mark, as they were anxious that it might threaten domestic stability, especially during times of speculation, by causing appreciation of the Deutsche Mark (Gebhard, 1998). It was feared that an increase of investment in the Deutsche Mark will cause demand for it to surge and the Deutsche Mark to appreciate. There was the concern that the Deutsche Mark foreign exchange rate might not correspond with its domestic and foreign economic performance. Furthermore, Germany feared that foreign investors would invest their money in the German capital market, which might increase the domestic money supply and thereby disturb domestic price stability (Gebhard, 1998).

The German economy suffered from disequilibrating capital flows between 1963 and 1974 due to the various difficulties they encountered in pursuing an anti-inflationary monetary policy under the fixed exchange rate system. A major concern for the German economy and monetary policy was an importation of inflation and therefore the measures (neutralization or compensation of capital inflow) were also a defence. The Deutsche Mark had undergone a full period without capital controls during the late 1960s and to build capital controls in the early 1970s, in an effort to protect the domestic money market from capital inflow. By 1973 Germany ended up with the most extensive capital control program in Western Europe, which primarily addressed capital inflows. The most important weapon for the Bundesbank to fight against capital inflows were a minimum reserve requirement with respect to the bank's liabilities and the cash deposit system of lending for non-residents.

Classical economic theory views international capital movements as an opportunity for countries with limited savings to receive financial support for domestic investment projects. At the same time investors have the chance to diversify their portfolio. This in turn spreads investment risks more broadly.[118] However, capital mobility is complex, as it is difficult to

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[118] See further Eichengreen and Hausmann (1999).

distinguish between disequilibrating capital flows and welcome-long-term capital inflows, the latter involving the real transfer of savings towards countries that are in need of capital. In a successfully functioning monetary system, the case of massive capital inflows appears to be limited to atypical cases, which require drastic measures to fight undesirable capital inflows.

This chapter addresses Germany's five major speculative waves of capital inflows between 1968 and 1973, the impact on the fixed exchange rate system, and the measures that the Bundesbank took to neutralise these attacks.[119] Several studies have analysed Germany's destabilizing capital flows and their capital control program, but few attempts have been made also to analyse their effects on the German balance of payments.[120] Under the fixed exchange rate system, the strongest motivation for capital movements has appeared to be expected changes in the exchange rate of the Deutsche Mark. The Federal Republic of Germany had shown a preference towards market-type solutions, but had also applied governmental controls if they could not be avoided. The German experience showed that the scope for "regulating" capital movements was limited, since the Deutsche Mark was "too attractive" and the limitation for acting was reached at an earlier point than in other countries. In an era full of ongoing predictions and discussions of the future of the international monetary system, and having reviewed the process of the internationalisation of the Chinese Renminbi, it is essential to look back to the troubling times of one of the most successful currencies of the world, whose authorities viewed currency internationalisation as a greater threat.[121]

III.2 The history of the Deutsche Mark

The literature typically locates the German political, cultural and economic changeover to the new Deutsche Mark on the 20th of June, 1948.[122] Germany at this time was going through the so-called *Wirtschaftswunder,* a speedy recovery-process from the war made especially possible

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[119] The term "speculative capital movements" refers in this paper to those movements that are associated with, or that are motivated by, an anticipation of a change in exchange rate. It is important to also mention that there is no exact point in time (down to a specific day) which marks the beginning and end of a speculative attack. The timeline for the five speculative waves of capital inflows discussed in this paper are estimations made to a greater or lesser degree.

[120] See for example Mills (1971), Frowen and Arestis (1977), Rohwäder (1990), Porter (1972), Hewson and Sakabira (1975).

[121] In order to provide a comprehensive German standpoint, extensive research was also conducted using the Historical Archive of the Deutsche Bundesbank (DB).

[122] See for instance Tribe (2001), Lutz (1949), Giersch et al. (1993).

by the reorganization of their domestic structure of production and a wide-ranging freeing of prices. The country was able to rebuild its reserves by the end of 1950. Consequently, there arose a political discussion of how exchange rate adjustment could preserve macroeconomic stability.

The Deutsche Mark quickly emerged as one of the most widely used currencies for trade invoicing and as an intervention currency within Europe. Germany became the leading economy within Europe and experienced a rising influence on macroeconomic conditions, since neighbouring countries had to keep their prices in line to avoid losses against Germany. They were under pressure to match the Deutsche Mark's high interest rate, and observers were even saying that the Bundesbank was determining the monetary policy for all of Europe. Therefore, the stability of the Deutsche Mark was of a high priority for Germany and Europe as a whole.[123] The directors of the Bundesbank decided to defend the existing exchange rate peg for as long as possible, since the Germans associated exchange rate stability with their earlier post-war economic recovery and the export boom. The German authorities also set the importance of price stability as a major goal, since they had lost their savings in two major inflations.[124] In the mid-1960s the inflationary monetary policy in the United States forced Germany to take a different direction in its monetary arrangements and in its intellectual environment. In an attempt to hinder an imported inflation and to maintain fixed exchange rates, Germany set capital controls.[125] The existing Bretton Woods system forced Germany to let its price level rise along with the US prices.[126] This shows that the Federal Reserve dominated the German monetary policy.

By the early 1970s the Deutsche Mark was widely acknowledged, but compared to the US dollar the role of the Deutsche Mark remained more regional than global. However, the

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[123] Cohen (2015). See also Benassy-Quere and Deusy-Founier (1994).

[124] 1923 and 1947/48. See for more Nölling (1993).

[125] This footnote includes some additional information on the relationship between the Bundesbank and the Federal Government. The Bundesbank conducts its monetary policy independently of the Federal Government, but they have the obligation to support the general economic policy of the Federal Government, without showing bias towards the performance of its primary objectives. Monetary policy is entrusted with the Bundesbank and is therefore required to safeguard the currency, but this is nevertheless also a field of matter to the Federal Government. The Bundesbank is required to respect the economic policy conducted by the Federal Government and must actively support and implement the decision by using the instrument they have. But this obligation to provide support occurs only when it is compatible with the Bundesbank's prime function. See also Sections 3, 12 and 13 of the Bundesbank Act.

[126] The US imposed capital controls which led to an undervalue of the Deutsche Mark and overvalued the US dollar. Consequently, Germany faced different times of re-valuations of the Deutsche Mark. First, in March 1961 the Bundesbank revalued the Deutsche Mark against the US Dollar by 5 per cent. Second, in 1969 the Deutsche Mark has been let float upward and has been pegged by 9.3 percent. In December 1971 the deutsche mark has been revalued at 13.6 percent against the US dollar.

inflationary American monetary policy led to a final collapse of the Bretton Woods system in March 1973.[127] After the free float of the Deutsche Mark, the Bundesbank focussed on lowering inflation and decreasing money growth. The Bundesbank debated publicly on which path to use to set the right monetary policy. On the one hand, the hawks' goal was to use money targets to lower money growth and inflation. On the other hand, the doves' main objective was to set expansionary monetary policy.

By the end of 1974 the doves' option was more favoured, and the Bundesbank began to lower interest rates and targeted money growth to the tune of 8 per cent. The fall of the Bretton Woods system and the beginning of a free-floating Deutsche Mark gave the Bundesbank new independence, and opened a new path that would set the Bundesbank's policy of the 1980s: namely, the independent, monetarist policy of West Germany.[128] Now, the Deutsche Mark was able to gain more approval in the financial markets and became the second international currency after the US dollar.[129] It is also worth mentioning that the global role of the Deutsche Mark began as a reserve currency (see Table 3.1). By the 1990s Germany became the world's second largest trading country with a share of about 10 per cent, behind the United States and ahead of Japan. The share of the Deutsche Mark in the global trade was by the early 1980s at 13.6 per cent, and this increased to 15.5 per cent in 1992.[130] Germany's low inflation and economic integration in the world market reinforced the status of the Deutsche Mark as a medium of exchange and a unit of account for private market actors.

Table 3.1: Currency Shares of major currencies in total foreign exchange reserves

	1965	1970	1975	1980	1981	1982	1983	1984	1985	1986	1987
USD	66.4	77.2	79.5	68.6	71.5	70.5	71.2	69.4	64.2	66.0	67.1
Pound Sterling	22.3	10.4	3.9	2.9	2.1	2.5	2.6	3.0	3.1	2.8	2.6
Deutsche Mark	0.2	1.9	6.3	14.9	12.8	12.3	11.6	12.3	14.9	14.9	14.7
French franc	1.5	1.1	1.2	1.7	1.4	1.2	1.0	1.1	1.3	1.2	1.2
Swiss franc	0.1	0.7	1.6	3.2	2.7	2.8	2.4	2.1	2.3	1.9	1.6
Yen	0.0	0.0	0.5	4.3	4.0	4.7	4.9	5.7	7.8	7.6	7.0
Dutch Gulden	0.0	0.1	0.6	1.3	1.1	1.1	0.8	0.8	1.0	1.1	1.1

Source: International Monetary Fund.

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[127] Hetzel (2002) argued that the high amount of money growth caused the inflation in the 1970s.
[128] Hetzel (2002).
[129] However, the international role of the Deutsche Mark began as a reserve currency. The Deutsche Bundesbank stated that the Deutsche Mark probably replaced the Sterling as a reserve currency in the early 1970s. See Table 3.2 (DB, Monthly report, January 1990).
[130] See McCauley (1997).

As I explained in Chapter 1 on low inflation, a large and open economy promotes network externalities, which is essential for currency internationalisation. This externality has been driven forward through various trade agreements in the 1980s which reduced trade barriers within Europe. As a supplier and a market, more countries in Europe were at this stage depending on the stability of the Deutsche Mark. In particular, Eastern European countries were using the Deutsche Mark, to such a point that the President of the Bundesbank, Hans Tietmeyer, stated in 1991 that "the substantial amounts of Deutsche Mark circulating in these countries […] has in some cases reached the proportion of a parallel currency".[131]

[132] Seitz (1995) analysed the circulation of the Deutsche Mark and found that by 1994 about 30 to 40 per cent of the currency's total issue was held outside Germany. Deutsche Mark banknotes that circulated abroad were held as a store of value and for the purposes of transaction. This shows the strength and stability of the German economy, and consequently the acceptance of the Deutsche Mark abroad, which pushed its growth as an international currency. The success of the Deutsche Mark took place without any efforts by the Bundesbank or the German authorities. All in all, the six official roles of an international currency were more or less fulfilled (see Table 3.2).

Table 3.2: The international role of the Deutsche Mark

	Private	Official
Unit of account	• Dominating in German trade. • Use of the Deutsche Mark in invoicing exports to Germany	• Anchor Currency in the EMS • Dominates many currency baskets (particularly in eastern Europe) • Reference Currency
Means of payment	• Growing vehicle currency in third countries	• Leading intervention Currency in the EMS • Growing importance as an intervention currency for the USA
Store of Value	• Attractive currency for foreign investors • Reached the second rank in international bond issues in 1995	• World's second most important reserve currency

Source: Gebhard (1998).

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[131] See also Gebhard (1998).
[132] Cohen (2015).

III.3 Regulation of the Deutsche Mark

The Deutsche Mark was a high achiever, but it never came close to challenging the dollar. The reason for this related to an array of capital controls and the reluctance of the German government and the Deutsche Bundesbank to promote the internationalisation of the Mark. In particular, the increasing international role of the Deutsche Mark had raised concerns about domestic stability. Until the early 1980s the Deutsche Bundesbank wanted to limit the use of the Deutsche Mark, particularly as a reserve currency, since this might interfere with domestic stabilisation (Unger, 1991).

A major fear behind this lay in the increase of capital imports, specifically if foreign investors invested money in the German capital market which in the end might affect domestic price stability. The Deutsche Bundesbank and the German authorities viewed capital imports as needless from the point of view of the balance of payments, or as unwanted from the point of view of monetary policy. Also, if investments in the Deutsche Mark surged, they could cause an appreciation of the Deutsche Mark. The restrictions therefore addressed mainly capital inflows. The Bundesbank's use of sterilization policy was able to relieve itself from inflationary effects of capital inflows, but it was not able to preserve the exchange rate peg (Walter and Sen, 2009).[133]

Therefore, in 1963 the 'coupon tax' had been introduced on foreign interest income from holdings of German domestic bonds, in order to make German bonds less attractive to foreign investors. However, non-residents found a way to get around the 'coupon tax' and shifted from holding German domestic bonds into foreign DM-denominated bonds, which was a part of the rising Euro-bond market (see Table 3.3).

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[133] The Bundesbank's sterilization policy included the selling of government bonds to the banking sector. But selling more bonds required higher yields, which consequently pushed the capital inflow.

Table 3.3: Transactions on account of fixed interest securities[1]

	1957-58	1959	1960-63	1964-67	1967	1968
Bonds, net	76	-141	252	-171	-326	-1064
(i) resident capital	-19	-108	-18	-118	-117	-1026
(ii) non-resident capital	95	-33	270	-53	-209	-38
Memorandum items:						
Net issues of foreign DM bonds	14	82	16	261	183	1476
Of which purchased by German investors	n.a.	n.a.	6	78	34	930
A German company Issues abroad	n.a.	n.a.	27	42[1]	45[1]	-

[1] - : net capital outflow from Germany

[2] This figure includes issues of Euro-bonds by foreign-incorporated special financial companies of German enterprises. Such issues are not recorded in the balance of payments as an inflow of bond capital to Germany.

Source: Deutsche Bundesbank (1969, DB, Historical Archive File B 330-20667).

To control their monetary policy, the Bundesbank signed the 'gentleman's agreement' with German banks in 1968, which, according to the text of the agreement, had the following purpose:

"This agreement provides for the Bundesbank's being informed continually of all foreign Deutsche Mark bonds being prepared for issue (including private placement). It was further agreed that German banks will only participate in the sale of foreign Deutsche Mark bonds when a German bank takes over the syndicate leadership – or in the case of loans in foreign currencies with Deutsche Mark option the co-leadership. The proceeds of such loans are as a rule to be converted immediately to dollars and transferred abroad." (Deutsche Bundesbank, 1975).[134]

During that time Deutsche Mark bonds became very popular, but Germany's financial market was still not very open and very well developed, with a great number of compound regulations and taxes. This hindered the Deutsche Mark's development as an international currency (Boeck and Gehrmann, 1974). However, the existence of the Euro-Deutsche Mark market offered further investment opportunities for non-Germans, and therefore the holding of Deutsche Mark by foreigners could not be hindered. Another issue related to security, since Germany was a

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[134] The 'gentleman's agreement' was later lifted in 1976.

divided nation because of the ongoing Cold War, which in turn disturbed the opportunities for the Deutsche Mark to become the leading international currency (Strange, 1980).

With regard to the international role of the Deutsche Mark, Germany was not able to hinder the trend and attractiveness of its domestic currency, and lifted its last capital controls in 1981.

III.4 The German experience of destabilizing capital movements: 1967-1973

Between 1960 and 1965, the Deutsche Mark rate remained calm and stable. One of the key reasons for this was that the U.S. development of costs and prices and the U.S. balance of goods and services, both of which exercised a positive impact on the Deutsche Mark.[135] After 1965, the financing of the Vietnam War and the Great Society program caused a rising balance of payments deficit in the United States. This rekindled inflation became a major problem that the global economy faced.[136] In January 1965 the Bundesbank began to tighten its monetary policy, which also corresponded to the high current account deficit that occurred in 1965, when the Bundesbank started to decrease its money supply (Emminger, 1977). This restrictive policy saw its peak in May 1966, when the discount rate was raised to 5 per cent (see Figure 3.1).

However, the combination of the balance of payments deficit and the cost of inflation had a dampening effect on economic activity (Emminger, 1977). Subsequently, the restrictive policy has been largely blamed for the recession in 1966-67. In December 1966 the monetary policy in Germany was eased in order to strengthen the impact of the expansive fiscal policy. The outcome was a slackening of imports, just at the same time as exports were increasing enormously and were causing a large surplus on the current accounts. The increase in international interest rates, the combination with low interest rates and the plentiful availability of liquidity in Germany resulted in a large long-term capital outflow from Germany. This made it difficult for Germany to maintain its low interest rates, which were becoming ever more able to adjust Germany's economic conditions. For the first time in 1967, Germany became a major

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[135] Deutsche Bundesbank Historical Archive, File B 330-20656. The official Council of Economic Advisors reported in 1964 that, in an inflation-prone world, the introduction of a flexible exchange rate would help Germany to avoid imported inflation. The economists Friedrich Lutz (and also Egon Sohmen) also supported the idea of a flexible Deutsche Mark rate. See also Lutz (1954).

[136] The Great Society program was launched by President Lyndon B. Johnson and attempted to eliminate poverty and racial injustice within the United States. See also Dudley and Passel (1968) on the war in Vietnam and the US balance of payments deficit.

capital exporter. However, these financial exports did not offset the accelerating current account surplus (see Table 3.4 below; DB, Annual Report 1970).

Table 3.4: Germany: Balance of payments summary (1967-1973)

	1967	1968	1969	1970	1971	1972	1973
Current account[1]	+ 10.1	+ 11.9	+ 7.5	+ 3.6	+ 3.1	+ 3.3	+12.4
Long-term capital transaction	- 2.9	- 11.2	- 23.0	- 0.9	+ 6.3	+ 14.8	+ 8.1
of which: Portfolio transactions	- 2.0	- 5.6	- 10.7	- 0.7	+ 2.5	+ 14.7	+ 2.9
Short-term capital transactions of non-banks	- 4.1	+ 2.6	- 0.3	+ 8.0	+ 3.0	- 3.2	+ 8.7
Balancing item	+ 1.7	+ 1.2	+ 0.9	+ 3.3	+ 2.7	+ 1.2	+ 2.5
Overall foreign exchange balance	+ 4.8	+ 4.5	- 14.9	+ 14.0	+ 15.1	+ 16.1	+ 31.7
Bundesbank reserves (excluding valuation changes)	- 0.1	+ 7.0	- 10.3	+ 21.9	+ 16.4	+ 15.7	+ 26.4

[1] Including private and official unilateral transfers. Note: in billions of DM (milliards).

Source: Deutsche Bundesbank, Annual Report 1972 and 1974.

Figure 3.1 Lombard rate and Discount rate in Germany from 1960-1975
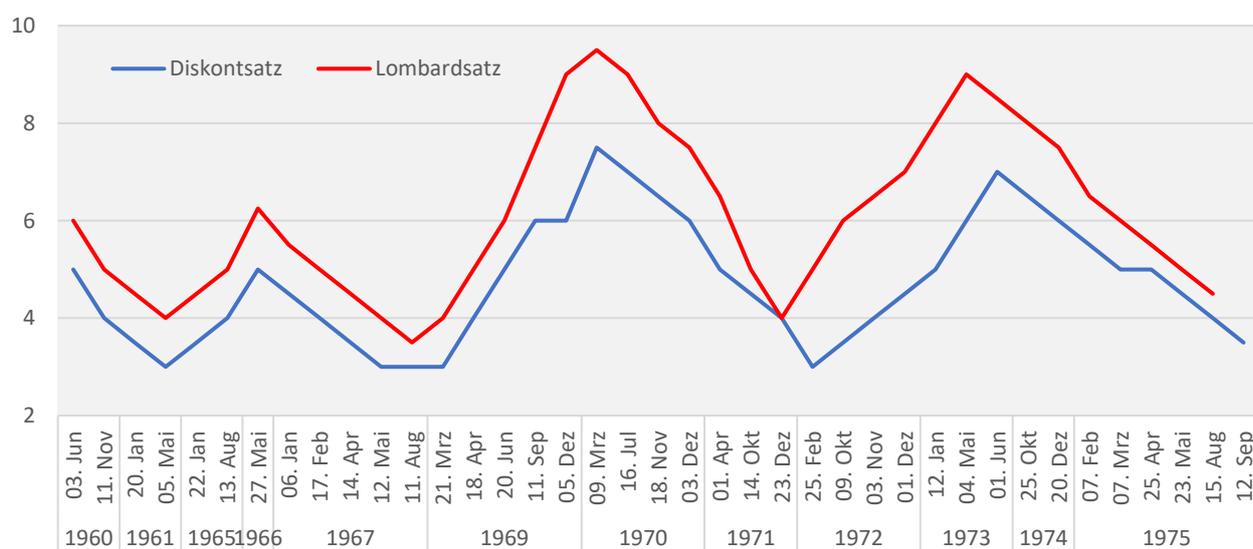
Note: The Lombard rate is the rate on short-term bank loans against eligible securities as collateral with the central bank. In circumstances where the discount quotas are exhausted, resort to Lombard credit becomes the marginal source of refinancing. This higher rate then automatically determines the money market rates.

Source: Deutsche Bundesbank (1988).

As a result of this, the large surplus on current accounts remained, and the large capital outflow did not lead to a stable equilibrium. In order to balance this disequilibrium, it was believed that strengthening domestic demand would help to cause the large export surplus to decline. However, the hoped-for outcome did not occur, and short-term capital flows reacted strongly and repeatedly causing the first speculative wave on the Deutsche Mark exchange rate.

III.4.1 The first speculative attack in November 1968

In late 1968, the sharp rise in portfolio investment and long-term credit caused the first large long-term capital outflow of 2.5 billion U.S. dollars (DB, Historical Archive, File B 330-20667). The French franc and British pound currency crises in mid-1968 had no immediate effects on the Deutsche Mark, yet it was from about that time that the Deutsch Mark attracted more attention (DB, Historical Archive, File B 330-20667). In November 1968 the crisis became poisonous: the situation in France caused a transfer of funds into Germany, which generated a speculative wave towards the Deutsche Mark from abroad. The Bundesbank was thereby forced to purchase 10 billion U.S. dollars to defend the Deutsche Mark rate against appreciation. The government, but not the Bundesbank, were responsible for the exchange rate policy and refused to revalue the Deutsche Mark. Emminger (1977), the then President of the Bundesbank, described this as a "real opportunity that was missed" to achieve a coordinated re-valuation of the Deutsche Mark. To counter this influx of foreign funds, the central bank decided to pass an *Ersatzrevaluation* (a "substitute" or "replacement" re-valuation), and to reactivate the minimum reserve constraint on the growth of the banks' external liabilities (Hewson and Sakakibara, 1975).[137]

The actions taken by the German authorities immediately prompted an outflow of funds. Through another shift of the German bank's foreign policy, a considerable amount of money started to flow back into Germany in January 1969 (DB, Historical Archive, File B 330-20666). The non-banking sector's inflow reversed some 3.5 billion Deutsche Mark within the first three weeks of the crisis. Hence, during the speculative attack the central bank's net reserve declined by 10.5 billion Deutsche Mark as far as January 1969.

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[137] This measure was retained until the re-valuation of the Deutsche Mark in October 1969.

III.4.2 The second speculative attack in May and September 1969

The actions that has been taken in November did not lead to a solution of the severe disequilibrium of Germany's balance of payments nor did it resolve the situation in France. The current account surplus could not be corrected since domestic demand strengthened (see Table 3.4; DB, Historical Archive, File B 330-20667). The rising demand and price inflation abroad, particularly in France, made German exports more competitive (Anonymous, Frankfurter Allgemeine Zeitung, 1975).

From April to May 1969, the Deutsche Mark faced another speculative attack, which pushed 17 billion Deutsche Mark of foreign exchange within ten days into the Bundesbank reserves, twice as much as there had been in November 1968 (DB, Historical Archive, File B 330-20667). After the announcement on May 9, 1969 of the Federal Government that they would not alter the Deutsche Mark exchange rate, a backflow occurred. This was to some degree a shift of official reserves into short term foreign assets held by the banks. The large long term capital exports derived mainly from the attempts by the banks to put ample liquidity deriving from short-term inflows to good use abroad, supported to offset the trend of short-term inflows that were caused by exchange rate expectations and uncertainties. But these long-term outflow were not sufficient to balance the large speculative inflows. During the first nine month of 1969 almost 17.5 billion Deutsche Mark flowed into the non-banking sector on a net basis, either through changing 'terms of payments' or direct credit operations (DB, Historical Archive, File B 330-20667).[138] Within the first three weeks in September 1969, the Bundesbank absorbed over 6 billion Deutsche Mark through interventions, of which 1.5 billion Deutsche Mark were swapped back to the banks (DB, Historical Archive, File B 330-20667).

In sum, the first three quarters of 1969 were marked by the inflow of funds from abroad, somewhat in anticipation of a DM re-valuation, and were highly volatile (see Table 3.5). As a consequence of this, the speculative wave caused a closing of the foreign exchange markets on September 26th 1969. Additionally, the increased restrictive monetary policy abroad and the comparatively low interest rates in Germany had tripled long-term lending out of the country.

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[138] This included the devaluation of the French franc in August, 10 1969 that caused more focus towards the Deutsche Mark, rather than less.

Table 3.5: Short-term capital movements before and after the DM re-valuation in 1969[1]

	1st – 3rd quarter	4th quarter
1. Total enterprise sector of which:	$ 4.0	$ - 4.0
Short-term conditions	$ 1.3	$ - 1.5
Errors and omissions	$ 2.7	$ - 2.5
2. Credit institutions		
Short-term liabilities	$ 0.7	$ - 0.2
Vis-à-vis foreign banks		
Total	$ 4.7	$ - 4.2

[1] Excluding December 1969.

This lending accounted for nearly 84 per cent of the total long-term capital exports, which was a 20 per cent rise from 1968 (c). The final trigger of a reversal speculative wave came on the 27th of October 1969, when the Deutsche Mark was re-valued by 9.3 per cent to 3,66DM/per Dollar, from 4 DM/per Dollar (Holtfrerich, 1998).[139] This re-valuation reduced the official reserves by 20 billion Deutsche Mark until the end of the year (DB, Historical Archive, File B 330-20667). The re-valuation of the Deutsche Mark supported a relaxation of worldwide monetary tension for.

At the same time, 1969 was also marked by extraordinary long-term capital outflows of 5.9 billion U.S. dollars, which meant that Germany became the world's biggest exporter of long-term funds. To draw a comparison here, outflow across the whole decade of the 1950s had scarcely totalled 0.5 billion U.S. dollars. Within a short period after the re-valuation the German balance of payment underwent a complete shift. The current account surplus declined strongly until late 1970. Higher interest rates and tighter domestic liquidity than abroad caused an end of the large long-term capital inflows (DB, Historical Archive, File B 330-20667).

By the end of January 1970, the liquidity ratio of the banking system amounted to about 6 per cent of the total deposit, which was the lowest ratio since the tight monetary period of 1966. The banks relied heavily on re-financing possibilities with the Bundesbank, especially the Lombard credits. The increase of the Lombard rate to 9 per cent in December 1969 and again

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[139] The delayed re-valuation of the Deutsche Mark to stabilize prices failed, because the price and cost of inflation were so high that the re-valuation was not able to balance it out. This shows that inflation had already developed to a very great degree. See the Deutsche Bundesbank, Annual Report 1969.

in March 1970 to 9.5 per cent triggered an upward movement of the domestic short-term rates (see Figure 3.1). Until the end of January 1970, the incentive to export capital diminished (DB, Annual Report 1974). Indeed, 1970 began with a shift of the post-revaluation outflows, since large capital inflows through the banks were realised. The Bundesbank – albeit unsuccessfully – acted with a "special" gradual minimum reserve requirement of 30 per cent on foreign liabilities from April 1970.

Moreover, an additional purpose of the minimum reserve requirement was to insulate the Bundesbank by allowing it to tighten monetary policy from the undesirable borrowing of German banks abroad. Unfortunately, the tight monetary policy conducted by the German authorities induced banking and non-banking capital inflows. Walter (1973), for example, noted two main loopholes that caused the circumvention of the minimum reserve requirement. First, domestic non-banks received non-residents' deposits, which they borrowed abroad. Second, domestic banks issued securities that were not subject to the minimum reserve requirement. However, the Bundesbank did not change its restrictive credit policy, but rather set itself the goal of narrowing the interest differential with the United States and on the international money market. Therefore, in a first attempt the Bundesbank reduced the discount rate by 0.5 per cent from 7.5 per cent in July 1970. In November and December, the discount rate was reduced still further to 6 per cent, and on the 1st of April 1971 in turn to 5 per cent (see Figure 3.1; DB, Annual Report 1970).

III.4.3 The third speculative wave in May 1971

The central bank failed to contain current short-term inflows through interventions in U.S. dollars. This period was also determined by *ad hoc* changes in U.S. policy and speculative waves of capital inflows and outflows in dollar funds, which affected to a large degree the money supply in Germany's stabilization policy (Emminger, 1977). The net capital outflow from the U.S. reached a height of 28 billion U.S. dollars, which was two and a half times higher than in the previous year. This currency crisis was not only a U.S. dollar / DM crisis, but one which also expanded into a worldwide monetary crisis (DB, Annual Report, 1971). The Deutsche Mark had been pushed as a 'counter-pole' to the U.S. dollar. The Bundesbank's external assets jumped from 26 billion Deutsche Mark in the beginning of 1970 to more than 68 billion Deutsche Mark by the end of May 1971, and during the full year of 1970 the

Bundesbank's net reserve rose by 22 billion Deutsche Mark (DB, Historical Archive, File B 330-20667).

Moreover, the banking flows were very concerning, despite the little success of early 1971, with regard to an outflow of 4 billion Deutsche Mark. Against the rising tide and as a last resort in May 1971, the Deutsche Mark had been released to float.[140] Three weeks after the floating of the Deutsche Mark, the Bundesbank intervened for the first time again and sold dollars at a weaker rate, which caused a shrink in reserves by 6 billion Deutsche Mark until August 1971, and which further decreased by a net of 2.5 billion Deutsche Mark by the end of the year (DB, Historical Archive, File B 330-20667). The non-banking sector was able to re-export 12.5 billion Deutsche Mark through both loan repayment and a normalisation of the 'terms of payments'. Then, the U.S. balance of trade turned into a deficit for the first time in April 1971. President Richard Nixon was triggered by the French and British intentions to change dollars into gold and suspended the gold convertibility on August 15th 1971, and major currencies began to float temporarily. This decision ended a key aspect of the Bretton Woods System. During that time, floating was considered a provisional solution to a bridge to new parities. The Washington Monetary Conference of December 1971 (Smithsonian Agreement) readjusted the system of fixed exchange rates. The Smithsonian realignment did not end the problem of capital inflow and hence lasted no more than just over a year (DB, Annual Report 1972). The foreign exchange crises in March 1973 again caused a collapse of the fixed parity system, which ended the Bretton Woods system indefinitely (Bordo, 2017).

III.4.4 The fourth speculative attack in June and July 1972

In the beginning of 1972, the United States was (again) the origin of destabilizing capital inflows. For fifteen months the deficit on the U.S. official reserve transactions reached 21 billion U.S. dollars. The reason was large capital outflows from the United States to Europe. The U.S. monetary authorities loosened their monetary policy and thereby effected the highest monetary expansion in the post-war era (DB, Historical Archive, File B 330-20667). To avoid interest rate incentive exchange inflows the Bundesbank reduced in December 1971 and

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[140] There are some indicators of the role of the Euro-market before the floating of the Deutsche Mark. First, the market acted as a go-between for funds which originated mainly in the United States. This came about through the Euro-bank, who either obtained refinancing in New York or re-lended in U.S. dollars funds that were repaid by U.S. borrowers, once the credit crunch was shifted through the change to an expansive monetary policy in the United States.

February 1972 the discount rate to 3 per cent.[141] At the same time, the German authorities introduced a "Bardepot" (a cash deposit requirement) of 40 per cent on the proceeds of loans and other credits from non-residents (Courakis, 1977).[142] Another channel of capital inflow had to do with the sale of German securities. These sales reached their peak during the British sterling crisis (DB, Monthly Report, May 1973).[143]

The sterling was hit by a confidence crisis caused by inflation and a weak balance of payments. Unfortunately, in June and July 1972 Germany again became the favoured currency for speculative funds, which was caused by an outflow of the sterling as well as an outflow of the U.S. dollar (DB, Historical Archive, File B 330-20667). The Bundesbank responded to the sterling crisis with a raise of the reserve requirement to 60 per cent in July 1972, and the "Bardepot" was raised to 50 per cent. The low Euro-Dollar interest rates made borrowing attractive, and the sale of securities to foreigners reached a high from the short-term borrowing by enterprises that had restarted.[144]

This unrest caused a temporary closing of the exchange market and the Bundesbank was forced to take sterling and U.S. dollars. During and after the sterling crisis, a long-term capital inflow of 12.5 billion Deutsche Mark occurred (mostly through portfolio transactions). The short-term capital inflow of non-banks amounted to an additional 10 billion Deutsche Mark. These long and short-term inflows exceeded the increase in official reserves (by 19 billion Deutsche Mark). This difference can be explained by the net increase of the banks' foreign position (2 billion Deutsche Mark), as well as by the current account deficit (1.5 billion Deutsche Mark). The development in 1972, and later into January 1973, was dominated above all by these additional measures in response to the capital inflow from June and July (DB, Annual Report 1973).

III.4.5 The fifth speculative attack in February and July 1973

Due to the worldwide currency crisis and the uncontrollable destabilizing capital inflow, that extended from the end of January until the 9th of February 1973, there was a surge of funds that

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[141] See Figure 3.1
[142] See Emminger, 1977.
[143] An important factor of security sales was that foreigners were buying Deutsche Mark bonds held by Germans. The German authorities reacted with this tool of offsetting controls and instituted an administrative control on the sales of German securities abroad.
[144] For details of short-term capital movements between 1971-72 see Appendix III.B.

swept an estimated 9 billion dollars into the central bank reserves of some European countries and Japan (DB, Historical Archive, File B 330-20667). During this time, the Bundesbank had to purchase no less than 6 billion U.S. dollars (equivalent to 18.6 billion Deutsche Mark) to defend the dollar (DB, Historical Archive, File B 330-20666). These large speculative flows prompted the closing of the exchange market in Europe and Japan for a few days, and before reopening on the 12th of February the dollar was de-valued by 10 per cent and the Japanese yen floated upwards. After a short break of two weeks, in which some of the floats were reversed, Germany faced a speculative attack on the Deutsche Mark. At first the speculative wave hit the Swiss franc, then the Dutch guilder, and, on the 1st of March, the Deutsche Mark. The Bundesbank purchased the highest amount ever of 2.7 billion U.S. dollars to defend the Deutsche Mark rate against appreciation. This attack lasted three days in full and in Germany a single day.

In short, both speculative attacks caused an outflow of 12 billion dollars into other currencies, of which 7.6 billion flowed out into the Deutsche Mark. Furthermore, significant sums flowed to the Netherlands and Japan. Both crises were not connected to the Deutsche Mark, but the events in Italy, Switzerland, and the uncertainty surrounding the European floating caused a speculative wave, and in both cases the Deutsche Mark was singled out as the leading currency of refuge.[145] The differential of the interest rate did not play a role during these speculative waves. Prior to February 1973, the interest rate of the Deutsche Mark for foreigners was between 3 and 5 per cent, a rate which was much lower than the equivalent rates on Eurodollars. In fact, from the beginning of February 1973, interest rates on Deutsche Mark holdings of foreigners had fallen to zero, when compared to 7.5-8.5 per cent on Eurodollar deposits. However, despite the high interest rate differential, the inflow continued. It is worthwhile to note that Germany was not a surplus country any more. In January and February 1973, the surplus on current accounts was at most 100 to 150 million dollars per month, compared with an inflow of 7.6 billion dollars.

This shows the reputation of the Deutsche Mark in both cases, since when the crisis had reached a fever point it has been singled out as a safe-haven currency. Moreover, the destabilizing capital movements were unrelated to the balance of payments position. Hence, there was a fear about the origin of the volatile dollar funds, and it seemed that the Eurodollar market was not

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[145] A useful summary of this approach is given in Unger (1991).

the primary source.[146] However, towards the end of the speculative funds, there were further signs that a larger amount of speculative funds was financed through the Eurodollar market (DB, Historical Archive, File B 330-20663). Generally, a weak U.S. balance of payments, combined with the enormous amount of available dollar liquidity, was seen as the producer of monetary disturbances (DB, Annual Report 1970 and 1971). This overwhelmed the fixed exchange rate system.[147]

III.5 The preventive measures taken to offset capital inflow

The Bundesbank preventive measure forced them to leave the path of credit policy that they would have followed out of domestic interest if they had not be concerned about destabilising capital inflows. This shift of monetary policy, due to the balance of payment considerations, was not so much an exception as the rule and course of action from 1967 onwards. The conflict stands out especially between the spring of 1969 until the re-valuation and the substantial capital inflows from 1970 until May 1971, and during the sterling crisis in the first seven months of 1972.

The period of a fixed exchange rate gave rise to further conflicts than those which occurred during the times when the exchange rate of either the Deutsche Mark or the other European currencies who participated in the bloc floating was flexible.[148] In these circumstances the Bundesbank had to maintain a balance between these different objectives. The Bundesbank's policies to fight against capital inflow referred mainly to inflow from banks, in agreement with the division of the Deutsche Bundesbank and the German government. Only the Federal Government could order preventive measures against inflows from non-banks, such as exchange rate measures and the release of the Bundesbank from its obligation to intervene in the foreign exchange markets.[149] The Bundesbank's main defence against capital inflow was in making the banks uninterested towards receiving foreign funds.[150] It is also worth mentioning that the Bundesbank tried to mitigate speculative attacks through an intervention

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[146] The groups which are responsible for the shift from the dollar into other currencies have not been exactly defined. Emminger (1986) assumed that changes in the terms of payment were owed above all to different hedging operations, transfers of reserve holdings of monetary authorities into other currencies, and to the inevitable speculative flow.
[147] Deutsche Bundesbank Historical Archive, File B 330 – 20667.
[148] The following measures discussed here refer to the Deutsche Mark under the fixed exchange rate.
[149] See Deutsche Bundesbank Historical Archive, File B 330 – 20666.
[150] See also Günter (2000) for a discussion of Germany's internal and external conflict.

on the forward exchange market, but the waves were too heavy and could not be calmed with such measures.[151] In what follows the following preventive measures which were applied by the Bundesbank between 1967 and 1973 will be listed.

III.5.1 Reserve requirements

By subjecting an increase in the banks' external liabilities to a graduated minimum reserve, it is possible to discourage banks from borrowing abroad (DB, Historical Archive, File B 330 – 20666).[152] As long as the interest rate among the domestic and foreign currency remained within a 'normal' limit, a comparably low incremental reserve ratio is sufficient. For example, between April 1st 1970 and March 1st 1972 the implemented reserve ratio of 30 per cent was enough to prevent banks from directly borrowing abroad. However, when speculative expectations caused the interest costs of obtaining capital from abroad to drop to nearly zero, then a much higher reserve ratio was required, in order to make fund raising abroad unattractive (DB, Historical Archive, File B 330 – 20666). In general, the higher the reserve ratio, the more preventive effect that is obscured by the offsetting effect. Under speculative conditions, reserves on external liabilities of 100 per cent does not keep foreign money abroad, but it can balance the liquidity inflow to the banks.

In the period that I am analysing, the Bundesbank introduced in December 1968 a 100 per cent incremental reserve on external liabilities.[153] This addressed the minimum reserve requirements which were at the time 30 per cent for sight liabilities, 20 per cent for time liabilities, and 10 per cent for saving deposits. In July 1969, by revising the Bundesbank Act, it was possible to address non-residents' deposits to a minimum reserve of up to 100 per cent so that the above limitations ceased to apply (DB, Historical Archive, File B 330 – 20666).

After the beginning of July 1972, non-residents had the following reserve ratio requirements: 40 per cent for sight liabilities, 35 per cent for time liabilities, and 30 per cent for saving deposits.[154] This was an increase of 60% in all cases from November 1971. Together the reserve on the total and the reserve on the increase of the banks' external liabilities that result in any

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[151] These interventions usually had other purposes.
[152] See Bundesbank Historical Archive, File B 330 – 20663.
[153] See also Deutsche Bundesbank, Historical Archive, File B 330 – 20656.
[154] This has increased since November 1971 (in all cases) 60%. See also Deutsche Bundesbank Historical Archive, File B 330 – 20665.

rise were both subject to a minimum reserve of between 90 and 100 per cent, depending on the type of deposit (DB, Historical Archive, File B 330 – 20666).

The problem with this preventive measure was that banks found a way to get around it by raising funds in such a way that no liabilities were created that were subject to the minimum reserve. The Bundesbank was very concerned about this loophole, and therefore introduced on the 1st of June 1970 the banks' rediscount quotas, which they calculated as the amount of the increase in liabilities to non-residents arising from "fake" pension transactions shown in the balance sheets "below the line".[155] Another loophole that was closed in July 1972 related to the sale of bonds from the banks' portfolios. After September 1970 the Bundesbank only sold money market paper subject to the proviso that it would not be resold to non-residents (DB, Historical Archive, File B 330 – 20666).

III.5.2 Counterbalancing

Capital inflow of funds from abroad disadvantageously affected the monetary situation in the Federal Republic of Germany in two ways: first on the level of banking liquidity, and second on the level of money and quasi-money owned by non-banks.

Figure 3.2: Monetary development in Germany (year over year percentage change)
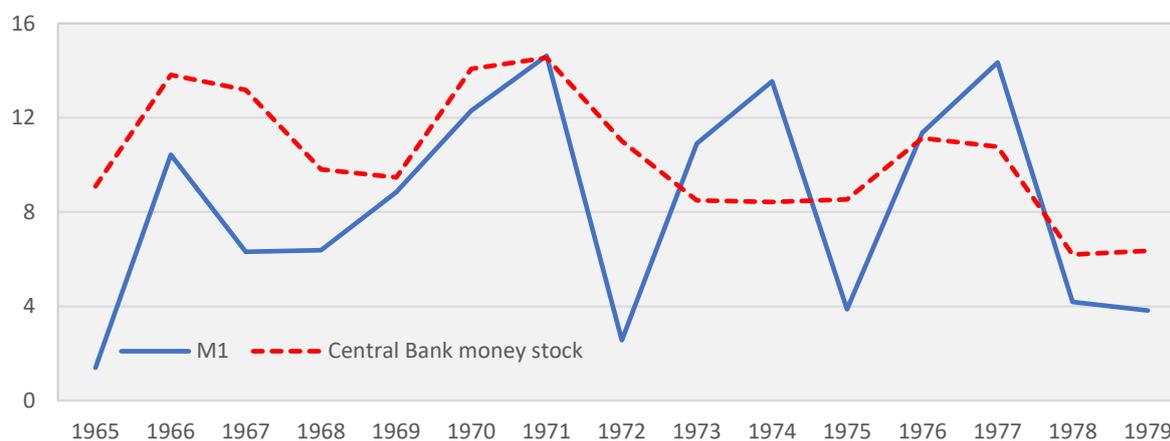
Note: M₁ = Currency and sight deposits of non-banks held with the Bundesbank. Central Bank money supply includes sight, time and saving deposit

Source: Deutsche Bundesbank.

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[155] See also Deutsche Bundesbank Historical Archive, File B 330 – 20656.

The Bundesbank's main objective was to regain control over the banking liquidity, an outcome which they achieved with relative quickness.[156]

However, it was still very difficult for monetary authorities to neutralise exchange inflows, as is shown in Figure 3.2. At the important level of capital held by non-banks, since this capital is closer to the actual demand for goods and services, the conditions for the neutralisation of the effects of massive inflows of foreign capital do not exist (DB, Historical Archive, File B 330 – 20666). Therefore, it is more vital for monetary authorities under certain conditions to prevent capital inflow from abroad rather than just to fight against its impact after the capital had already flowed into the country.

After November 1968 during the various speculative waves, capital inflows via non-banks became more important. Since this route was difficult to negotiate owing to the cash deposits, this tendency discontinued. In February and March 1973 Germany recorded the highest foreign exchange inflow than ever before, and the money and quasi-money held by non-banks rose by over 12 billion Deutsche Mark, the highest increase in a two month period (DB, Historical Archive, File B 330 – 20666).[157]

Table 3.6: Reserve ratios (percentage of reserve-carrying liabilities)

Saving deposits	Growth of liabilities					
Bank Places	Non-bank places	Sight liabilities	Time liabilities	Saving deposits	Explanatory notes on the growth reserve	Applicable from
5.94	4.95					1967 March 1
5.61	4.68					May 1
5.15	4.3					July 1
4.8	4					Aug. 1
4.25	3.55					Sep. 1
4.7	3.9	No special ratios				1969 Jan. 1
5.4	4.5					June 1
5.95	4.95					Aug. 1
5.35	4.45					Nov. 1
4.8	4					Dec. 1
5.35	4.45					1970 Jan. 1
6.15	5.15					Jul. 1
6.15	5.15	40		20	Additional reserve ratios for growth over the average level of the months April to June 1970	Sep. 1
7.05	5.9					Dec. 1
8.1	6.75					1971 June 1
7.3	6.1					Nov. 1
6.55	5.45					1972 Jan. 1

Source: Deutsche Bundesbank.

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[156] See also Deutsche Bundesbank Historical Archive, File B 330 – 20666.
[157] About 20 billion Deutsche Mark. See also Neumann (1978).

The measures taken by the Bundesbank to offset an externally induced increase of banking liquidity, where it had not been absorbed by the incremental reserve as mentioned above, had been extended to the entire period of their liquidity policy instruments. These consisted of the following instruments:

1. An increase in the general minimum reserve ratio. In the autumn of 1970 reserves were raised on domestic liabilities: 40 per cent for sight and time liabilities, and 20 per cent for saving deposits (these had, however, been applied temporarily, see Table 3.6);
2. A general reduction in the opportunities for a cut in the rediscount quotas; and
3. Open market operations with non-banks.[158]

Periodically, the cash deposit to be maintained on borrowing abroad by non-banks distinctly decreased bank liquidity.

Around the end of summer and autumn in 1972, the balances of cash deposits increased significantly, since domestic companies were able to surmount the cash deposit barrier on account of the low Euro-Deutsche-Mark interest rates. As the interest rate differential vis-a-vis the Euromarket reversed at the beginning of October 1971, a large amount of credit taken up by German companies was repaid abroad. Since then, the maintenance of cash deposits had fallen from the peak of 3.2 billion in October 1972 to 0.8 billion Deutsche Mark in April 1973.

The payments into cash deposits balances had absorbed not only bank liquidity but also the money held by non-banks (DB, Historical Archive, File B 330 – 20665) [159]

In the period that followed, the exchange market began to calm, the dollar was steadily gaining strength in relation to the Deutsche Mark, and German companies started to repay foreign loans which totalled 5 billion Deutsche Mark between August 1972 and January 1973. Short term inflows were dominated by a net inflow of banks by 6.5 billion Deutsche Mark, of which 5.5 billion came through an increase in foreign deposits at German banks.[160] In addition, the Bundesbank's gross reserves were also directly affected by an increased accumulation of the Deutsche Mark held by foreign monetary authorities, which in the end did not affect the net reserves.[161] 1973 had been the most difficult year for the banks: a record cost of money, losses

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[158] See Deutsche Bundesbank, Historical Archive, File B 330 – 20665.
[159] See also Deutsche Bundesbank Historical Archive, File B 330 – 20666.
[160] See also Appendix III.B.
[161] See Deutsche Bundesbank Historical Archive, File B 330 – 20666.

cost by interest arbitrage, and the minimum reserve requirement set by the Bundesbank without any interest to the banks being paid.[162]

III.6 Final remarks

To fight against currency internationalisation, Germany developed one of the most comprehensive capital control programs in Europe, in order to battle the pressure for re-valuation. This chapter has shown that Germany's monetary policy during 1967-1973 was not adequately prepared against external influences. The period between 1970 and 1973 was marked by large funds of multinational corporations, the huge availability of liquidity that very sensitively reacted to interest rate differentials, and currency speculation against the Deutsche Mark. Moreover, the major speculative upheavals in 1971 and 1972 were a consequence of the U.S. payment deficit, combined with the high volume of liquid dollar funds which overwhelmed the system of fixed exchange rate. Remarkably, once the international speculative unrest reached its height, the Deutsche Mark was singled out as the main currency of refuge.

The main reason for this was that Germany enjoyed an international reputation as a politically stable and democratic country, which translated into greater foreign confidence in the Deutsche Mark. The cash deposit requirement (Bardepot) that was introduced in 1970 on deposits of non-residents was one of the key tools that reduced short-term capital inflows. However, a system of fixed exchange rate cannot survive. The shift toward a floating system was a "last resort" against the destabilizing capital inflow, and acted as a protective measure in order to both safeguard orderly conditions in the exchange markets and avoid the inflationary effects of massive movements from one currency to another. At this point, holding on to the fixed exchange rate system would have worsened the situation, increased speculation, and continued the closing of the exchange market.

A key final conclusion also concerns the ineffectiveness of the German capital control program, which could be circumvented by foreigners and domestic residents in the free Euro-dollar market (Kouri, 1975). Hence, in the contemporary international environment, with its free movements on capital and goods, efforts to regain a fully independent monetary policy are highly unlikely to work. The global trust in the value of the Deutsche Mark and the

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[162] See Baehring (1973).

consequence of Germany's payment surplus had opened the gate to a floating Deutsche Mark. Even though the Deutsche Mark never became a rival to the US dollar, its rise in light of this turbulent period is impressive.

It remains to ask what lessons can be deduced from this example for the future fate of the Chinese economy. What can we learn from the German example with respect to the internationalisation process of the Chinese renminbi? The Chinese Renminbi, for instance, has the tendency to devaluate the yuan and is at present being compensated up by capital inflows through the liberalisation of the domestic financial market. One point of resemblance between the Deutsche Mark and the Chinese renminbi concerns their respective roles as regional currencies. Many countries within Europe relied on a stable Deutsche Mark and depended on using the currency. This shows the scope of the Deutsche Mark and the limitations of other currencies and their domains. Stability was a key factor not only for the Bundesbank and the German authorities, but also for European countries which used the Deutsche Mark (Irmler, 1970).

In the long term, the Deutsche Mark has brought the public good of price stability to a widening circle of states. By the same token, the renminbi is also a key regional currency in Asia but does not provide the same stability as the Deutsche Mark did. For instance, the renminbi recently experienced a sharp depreciation against the dollar, which immediately caused regional volatility for important other Asian currencies: Korean Won, Thai Baht and the Singapore dollar, which all reacted sharply to the renminbi's gyrations. Furthermore, the Deutsche Mark acted as an anchor and refuge currency for the whole region, something of which the renminbi is still not capable. Finally, and most importantly, Germany never set any ambitions to internationalise their currency nor to achieve political dominance over other countries. Yet its stability and growing importance in world trade set the tone for the rise of the Deutsche Mark.

The agreement between Germany and France to link their currencies within a European Monetary system (EMS) in the summer of 1978 set the path also towards the European monetary Union (EMU). But the key turning point in the 50-year history of the Deutsche Mark was the uniquely difficult task of unification with east Germany, that created economic and political shock waves. This not only challenged west Germany and Europe but also the process culminating in an EMU.

The economic system of the German Democratic Republic (GDR) had a fundamental weakness which has been successfully concealed for years to the outside world (Flassbeck and Horn, 1996; Appendix III.C). The monetary reform of the two Germanys began on the 1st July 1990 by replacing the GDR Mark with the Deutsche Mark at a ratio of one to one, which extended the Deutsche Mark area. The unification required massive financial transfer from the west in order to integrate the GDR into the German social market economy and caused a fiscal deficit (Lippert and Ströhmann, 1993). By the middle of 1990 Germany had paid more than one trillion Deutsche Mark, which mostly went into consumption rather than investment. The high deficit spending in combination with the sharp rise in money stock caused an overheating of West Germany's economy. To fight inflation, the Bundesbank conducted a tight monetary policy and raised interest rates between the beginning of 1991 and summer 1992 and thus a different monetary policy compared to other central banks.

However, the unification process did not hinder but rather sped up the ongoing EMU procedure. Next, in December 1991 at Maastricht, the members of the European Union signed the Treaty that laid the convergence criteria for the EMU.

In 1992 the inflation rate in Germany reached 4 per cent. Since the Deutsche Mark was the anchor currency within the European Monetary System (EMS), the Bundesbank restrictive monetary policy affected a slowdown on other European Economies. The Bundesbank's high interest rates had been blamed for the crisis. The anti-inflation efforts had been eased by the de facto appreciation of the Deutsche Mark in the EMS in fall 1992 (König and Willeke, 1998). The Bundesbank set a policy in which they cautiously and slowly lowered the interest rate because inflationary pressure still existed and monetary growth was still strong. The Bundesbank aim for stability was reached after 1994 when the inflation rate began to stabilise. The third stage of the EMU process began of the EMU on the 1st January 1999, with the then 11 Member States who were allowed to adopt the euro as the single currency.

Appendix

III.A Short term capital movement 1967-1969

Table 3.7 Germany Short term Capital movements (1967-1969)

	1967	1968	1969		
			Year	Jan - Sept	Oct – Dec
Credit institutions	- 4.8	+ 2.5	+ 4.3	- 0.2	+ 4.5
Claims	- 6.0	- 3.5	- 2.6	- 3.1	+ 0.5
	+ 1,2	+ 6.0	+ 7.0	+ 2.9	+ 4.0
Liabilities					
Companies	- 1.6	+ 0.5	- 0.2	+ 5.3	- 5.5
Claims	- 0.6	0	- 1.0	- 0.6	- 0.4
	- 1.1	+ 0.5	+ 0.8	+ 5.9	- 5.2
Liabilities					
Total	- 6.8	+ 4.2	+ 4.1	+ 5.2	- 1.2
Residual item	+ 0.4	+ 3.3	+ 2.5	+ 12.0	- 9.6

Source: Deutsche Bundesbank, Historical Archive File B 330 – 20667.

III.B Short term Capital movements 1970-1972

Table 3.8 Germany: Short term Capital movements (1970-1972)

	1970	1971			1972			
		Year	Jan-May	Jun - Dec	Year	Jan-May	Jun-Jul	Aug-Dec
Credit institutions	+ 7.9	+1.2	-4.0	+5.2	-0.4	-7.5	+5.3	+1.8
	+ 0.1	+0.1	-3.1	+3.2	-1.6	-2.7	+0.7	+0.4
Claims	+ 7.8	+1.1	-0.9	+2.0	+1.2	-4.8	+4.6	+1.4
Liabilities								
							Jun- Aug	Sep-Dec
Companies								
	+ 6.5	-1.4	+7.6	-9.0	-5.6	-3.2	+3.2	-5.6
Claims	- 0.6	+0.6	+0.5	+0	+0.5	+0.3	+0.4	-0.1
	+ 7.0	-2.0	+7.1	-9.0	-6.0	-3.5	+2.8	-5.4
Liabilities								
							Jun-Jul	Aug-Dec
	-0.4	+1.0	+1.0	+0	+0.7	+1.4	-0.2	-0.6
Total	+14.0	+0.8	+4.6	-3.8	-5.3	-9.3	+6.9	-3.0
Residual item	+8.2	+8.6	+12.2	-3.6	-6.8	+6.3	+3.3	-2.5

Source: Deutsche Bundesbank, Historical Archive File B 330 – 20667.

III.C International competitiveness of the DDR

Table 3.9 The Mark rate against the US dollar and the Deutsche Mark (1970-1988)

Jahr	Currency Return	Exchange rate against the US dollar	Exchange rate against the DM
1970	0,537	7,56	1,80
1975	0,519	5,50	2,20
1980	0,454	4,75	2,50
1985	0,338	7,80	2,60
1987	0,255	9,20	4,00
1988	0,246	8,14	4,40

Source: Thieme (1998).

"You don't write because you want to say something, you write because you have something to say."

[Francis Scott Key Fitzgerald, American Novelist, 1896-1940]

CHAPTER IV

CONCLUSION

This thesis has sought to contribute to the literature on international currency systems by focussing on three related issues: first, the development of the international currency system; second, the impact of the offshore market on emerging market economies; and finally, by looking back into the troubling times of one of the most successful currencies, the Deutsche Mark.

Although these three papers addressed different issues, they all speak to the ongoing discussion of the end of the hegemony of the US dollar and the possible shift toward a multipolar currency system led by the dollar, the Euro, and the renminbi. Chapter 1 showed that promoting a currency's global role is related not only to economic but also to domestic and geopolitical considerations. These considerations themselves concern the necessity of a country's power to gain international currency status. Until today the US dollar remains the main anchor currency in the international monetary system, and the data show no real signs of a decline, with the Euro remaining a distant second. The Eurozone has had its share of troubles in recent years and is still recovering from the sovereign debt crisis that erupted in 2010. A key issue has been the construction of the EMU and the financial market that hinders the further development of the Euro as an international currency. Moreover, the progress of the Euro leaves the question unanswered whether it has reached its limit or not. Hence, the power of the Eurozone cannot be compared to the greenback. As long as the US keeps its geopolitical status, few countries will switch to the Euro.

At the same time, China has developed into one of the world's powerful countries, but the lack of development in their financial market reflects the status of the renminbi and underlines the fact that it is still not ready for the international stage. The governor of the PBC, Yi Gang, has

stated that China is in no hurry for the internationalisation of the renminbi and that the process is natural and market-driven, being tied to China's own development. In other words, the internationalisation of the renminbi is the end of the beginning and must be treated as developed in tandem with the institutional development. With regard to the renminbi, the key question to ask is if emerging market currencies have a place in the international financial market. This question was addressed by my analysis in Chapter 2. Regulation is the key factor that drives the development of the offshore market. The uncertainty and instability of an emerging market provides the NDF market with an important instrument for their economic and financial development. The growth of a financial market represents a fundamental shift in the international monetary system, with implications for the practice of monetary power.

Building on the discussion and outcomes of Chapters 1 and 2, the Chinese renminbi was pinpointed among the major emerging markets as the single currency that can elevate its status in the international financial market. It appears unlikely that any other Asian currency is ready for such a prominent role in international finance. Nonetheless, not every country has either the ambition or the capability to promote internationalisation, which was the case for the Deutsche Mark in West Germany. In Chapter 3 it was shown how the Bundesbank actively restricted the cross-border use and was reluctant to promote the usage of the Deutsche Mark by non-residents. The turmoil of capital inflows between 1967 and 1973 mirrored the desperate control that the Bundesbank had over their monetary policy to maintain a stable currency and low inflation. Unfortunately, upon its absorption into the Euro, the question whether the Deutsche Mark had reached its limit as an international currency will remain unanswered. Capital flows across national borders has itself become a source of macroeconomic and financial instability, which affects above all emerging markets. The protection against the volatility of capital flows cannot be fully exercised for emerging market economies, and therefore keeping fiat money as a reserve is essential. However, emerging markets have an enormous share in the global economy and contribute to the share of global growth.

Since nothing in the history of human civilization has lasted forever, it is likely that the dollar's hegemony will also one day encounter its due-date. At the moment the only challengers to the dollar's crown are the Euro and the renminbi, and yet it is highly unlikely that the dollar will be replaced by one of these currencies. However, the ongoing development of the renminbi in China and the risk of a collapse of confidence in the dollar has opened the path towards a multipolar system which creates diversity and much-needed balance to oppose the dollar-

centred international monetary system. It is, therefore, not a question of if – but a question of how much longer – the dollar will and can retain its global role…

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