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Foreign Currency Denominated Assets and International Shock Absorption in Switzerland and Japan

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Abstract

Currencies of countries with persistent current account surpluses and high foreign currency denominated assets such as the Swiss franc and Japanese yen are under a persistent appreciation pressure, what restricts the degree of freedom in the choice of exchange rate regime. Official announcements (implicit communication) of appreciations can trigger runs into the domestic currency, which make appreciation expectations self-fulfilling. The resulting negative growth effect is likely to trigger interest rate cuts, which can add to unsustainable financial exuberance. It is argued that horizontal exchange rate pegs are the most effective tool to stabilize economies with large net foreign asset positions.

JEL-Codes: F150, F310, F330.

Keywords: international investment position, appreciation-induced risk, exchange rate risk, foreign exchange intervention, monetary policy independence, Switzerland, Japan.

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1. Introduction

In January 2015 the Swiss National Bank announced to float the exchange rate of the Swiss franc after it had been pegged tightly to the euro since September 2011. The announcement triggered a run into the Swiss currency, which led to a sudden appreciation of the franc versus the euro of up to 30%. Since then, the Swiss National Bank seems to have resumed discretionary foreign exchange intervention, seeming to keep the Swiss franc at a non-announced exchange rate target of above 1.0 Swiss franc per euro. Prime interest rates are kept negative to discourage capital inflows.

The exchange rate dynamics and policy response patterns of Switzerland in early 2015 are reminiscent of Japan following the 1985 Plaza Agreement, when the official announcement to appreciate the yen triggered a wave of speculative capital inflows. Indeed, Switzerland and Japan have similar macroeconomic characteristics with regard to persistent current account surpluses, foreign-currency denominated international investment positions, and the resulting exchange rate dynamics.

The literature on the impact of appreciations on macroeconomic conditions is comparatively small and focused on the impact of appreciation on exports and growth (Kappler et al. 2013, Levy-Yeyati, Sturzenegger and Gluzmann 2014). The impact of the international investment position on financial stability in the context of foreign-currency denominated debt has been modelled as origin of crisis in the first (Krugman 1979, Flood and Garber 1984) and third (Corsetti et al. 1999) generations of balance of payments crisis models. The inflation of foreign currency denominated debt in terms of domestic currency in the face of exchange rate depreciation has been identified as a motivation for exchange rate stabilization (Calvo and Reinhart 2002). Rey (2013) argues that in a financially globalized world, the degree of freedom in monetary policy making is only preserved under capital controls.

The research on the impact of positive net international investment positions on exchange rate policies and growth is less advanced. McKinnon and Schnabl (2004) identify financial market risk for countries with foreign currency denominated assets such as China and Japan. This effect can be expected to become stronger in a world, where external wealth positions are continuing to grow (Lane and Milesi-Ferretti 2007) and where an increasing

number of countries are running net foreign asset positions (Bénétrix et al. 2014). The question about the appropriate exchange rate strategy for countries with large foreign-currency denominated foreign assets positions remains, however, an open question.

Building upon Goyal and McKinnon (2003) and McKinnon and Schnabl (2006, 2009) a measure of risk originating in foreign currency denominated assets is identified based on an augmented uncovered interest rate parity condition. Switzerland and Japan are taken as case studies, because their foreign currency denominated asset positions are particularly large. Exchange rate flexibility, discretionary foreign exchange intervention and interest rate cuts as well as tight exchange rate pegs are discussed as alternative absorption strategies for this risk. Econometric estimations aim to trace the impact of the exchange rate strategy on growth under the side condition of the foreign asset position.

2. A Negative Risk Premium Originating in Foreign Currency Denominated Assets

The open interest rate parity condition assumes perfect arbitrage in international capital markets. For instance, a Swiss (Japanese) investor can place one unit of saving either at home for the interest rate i_{CH} (i_{Jap}) or in foreign for the interest rate i_{EA} (i_{US}). We assume for simplicity that a Japanese investor will only invest in the United States at the interest rate i_{US} and the Swiss investor will only invest in the euro area at the interest rate i_{EA}. This assumption reflects the regional currency habitat in the world economy. Whereas in Europe (and some neighbouring countries) the euro is the dominating international medium of exchange, unit of account, store for value, anchor currency, intervention currency and reserve currency, the dollar is the dominating international currency in the rest of the world (McKinnon 2013). The following section aims to model risk associated to foreign currency denominated assets (see also Latsos and Schnabl 2015).

2.1 The Uncovered Interest Rate Condition in Japan and Switzerland

Assuming perfect arbitrage, equal country risk, zero transaction costs and adjusting for exchange rate changes the return at the end of the investment period is for domestic and

foreign investment equal.[1] A higher (lower) return of foreign investment is compensated by the depreciation (appreciation) of the domestic currency versus the investment currency:

$$i_j - i_k = E(\widehat{e_{hl}}) \qquad (1)$$

In equation (1) the term i_j indicates the interest rate of the creditor country j (here Switzerland and Japan), i_k indicates the interest rate of the debtor economy (here US and Germany[2]/euro area). The term h represents the currency of the creditor country, the term l the currency of the debtor country. The term $E(\hat{e}_{hl})$ marks the expected percent exchange rate change between yen and dollar or Swiss franc and euro (Deutsche Mark) in price notation. Positive values indicate depreciation, negative values appreciation.

The interest rate differentials between Japan and US as well as between Switzerland and the euro area (Germany before 1999) are shown in Figure 1. For both country pairs we observe long-term downward trends in interest rates. Japan and Switzerland have mostly lower short-term and long-term interest rates than the large anchor countries US and Germany/euro area. Open interest rate parity as in equation (1) would suggest that the Japanese yen has been continuing to appreciate against the dollar and the Swiss franc against the euro (before 1999 against the German mark).

This is from a long-term perspective by and large confirmed by the exchange rate trends (Figure 2). Both the Japanese yen and the Swiss franc have appreciated since January 1980 by about 50% against the dollar and German mark (euro) respectively. This corresponds to an average appreciation of 2% per year. Nevertheless, from a year-to-year perspective significant departures from the open interest rate parity can be observed, as in some periods negative interest rate differentials are paired with depreciation versus the anchor currency. This is most obvious for the recent Abenomics, which depreciated the Japanese yen against the dollar by about 30% against the dollar since January 2013.

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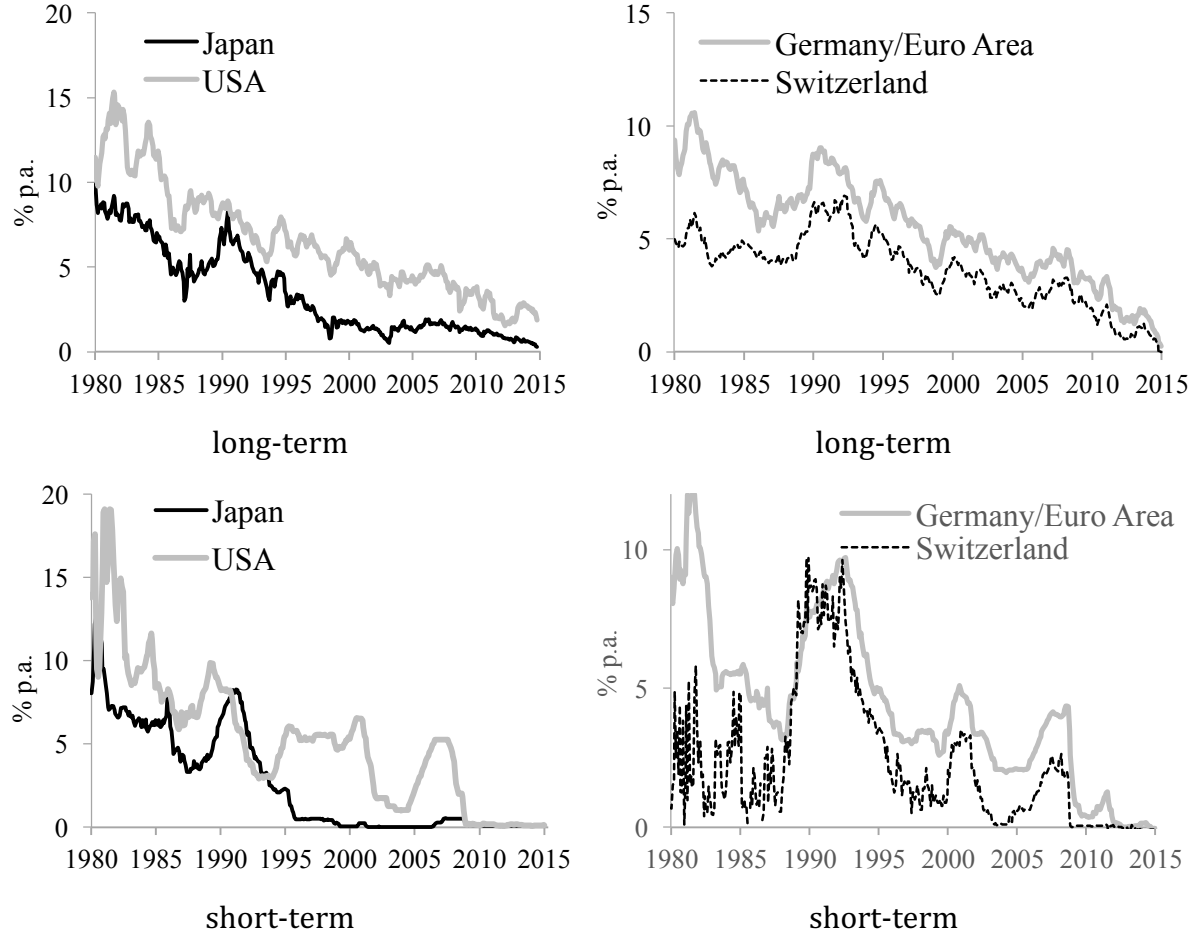
[1] Assuming the euro to be the only investment currency for Switzerland, the equilibrium condition for the Swiss investor is $1+i_{CH} = ((1+i_{EA})/e_t)*e_{t+1}$ what is equivalent to the uncovered interest rate parity as in equation (1). Empirical evidence in favour of the uncovered interest rate is mixed (see for instance Chin 2005).

[2] Germany (euro area) is assumed to be a net debtor country versus Switzerland and a larger net creditor country versus the rest of the world. That implies an overall international creditor position for Germany (euro area).

Furthermore, the interest rate differentials were in average larger than the average appreciations. This implies that even in the long run the interest rate differential cannot fully be explained by exchange rate changes as found by Kugler and Weder (2005) for Switzerland.

Figure 1: Interest Rate Trends in Japan/US and Switzerland/Euro Area(Germany)



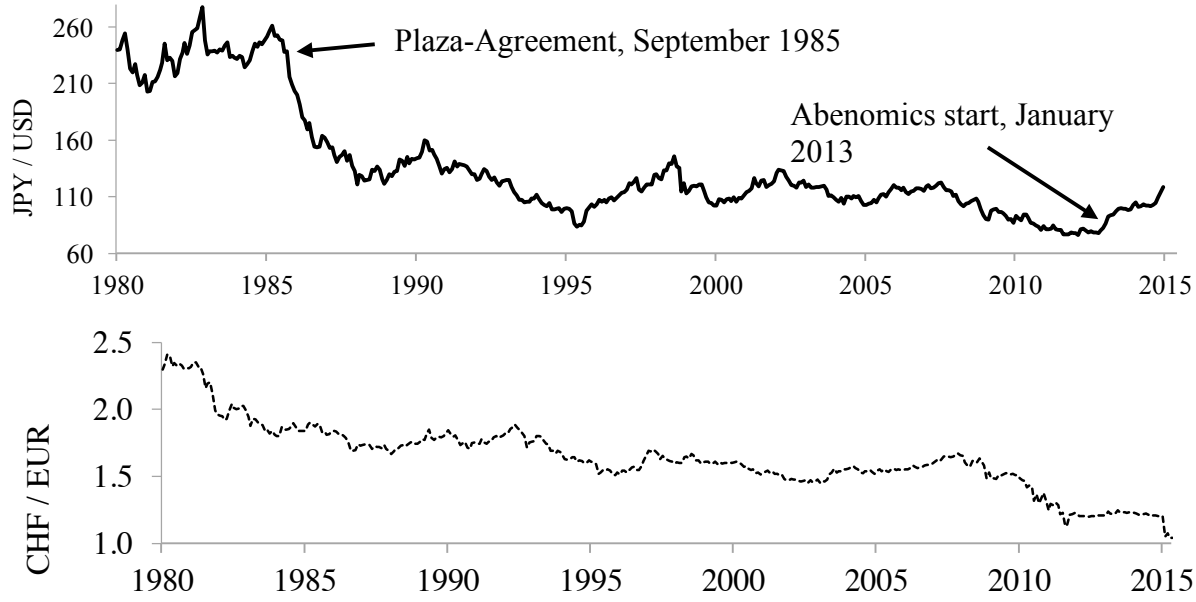
Source: IMF. Long-term is approximated by 10-year government bond yields, short-term is approximated by money market rates.

2.2 Net Foreign Assets and the Negative Risk Premium

To provide an explanation for this "interest puzzle", we build upon Goyal and McKinnon (2003) and extend the open interest rate condition by an interest rate premium φ, which reflects the exchange rate risk in countries with floating exchange rates. Since the collapse of the Bretton-Woods-System in the early 1970s the Japanese yen is floating – more or less – freely against the dollar (for details see Takagi 2015). Also the exchange rate of the

Swiss franc has been mainly floating.[3] However, from December 2011 up to January 2015 a publicly announced lower boundary of the Swiss franc against the euro (1.2 Swiss franc per euro) was defended by the Swiss National Bank to prevent further appreciation.

Figure 2: Exchange Rates Yen/Dollar und Swiss Franc/Euro(German Mark)



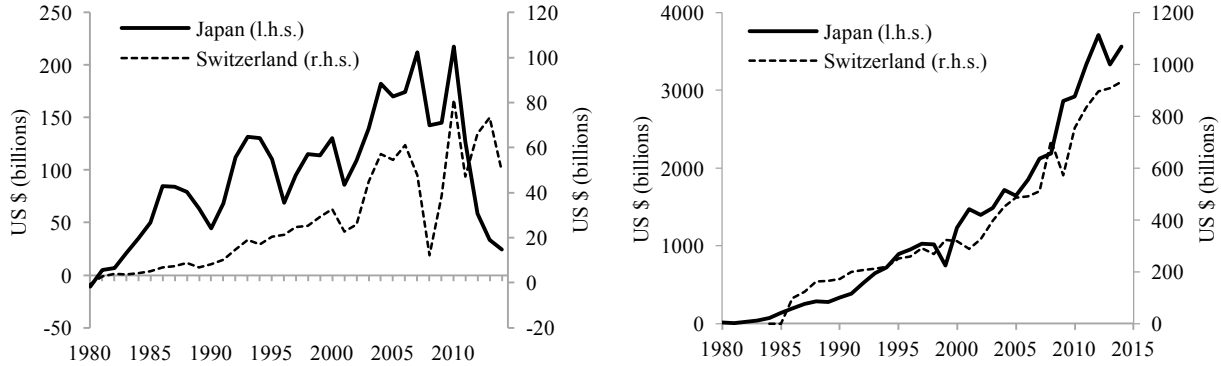
Source: IMF.

Exchange rate fluctuations cause two types of risk. First, export-oriented enterprises face uncertainty as real exports and/or profit margins fluctuate. Second, if international assets and liabilities are denominated in foreign (instead of domestic) currency, international debtors and creditors face a currency mismatch and currency risk. The domestic-currency return of investment in foreign currencies strongly hinges on exchange rate changes during the investment period. Higher interest earned in foreign currency lending may be overcompensated by the appreciation of the domestic currency. The question of what kind of exchange rate changes generate what kind of risk hinges inter alia on the sign of the net international investment position.

[3] For a historical overview of exchange rate policies including Switzerland and Japan see Bordo, Humpage and Schwartz (2012).

Without revaluation effects of foreign assets, net international investment positions can be seen as a function of accumulated past net capital exports, i.e. accumulated past current account positions.[4] Both Japan and Switzerland have current account surpluses since the early 1980s accumulated large net foreign asset positions (Figure 3). In countries with underdeveloped capital markets such as China international assets are denominated in foreign currency, because highly fragmented domestic capital markets do not offer sufficient investment opportunities (McKinnon and Schnabl 2004, 2009). Even in countries with highly developed capital markets such as Japan and Switzerland investment in foreign capital markets is strongly tilted towards foreign currency lending. The large euro- and dollar-based capital markets offer more attractive investment opportunities and lower transaction costs.

Figure 3: Current Account Balances and Net International Investment Positions in Japan and Switzerland



Source: IMF.

Table 1 shows that about 80% of cross-border claims of Japanese banks are denominated in foreign currencies, with the dollar having by far the largest share. For Switzerland the share of foreign currencies in international claims of Swiss banks is high as well. Although the BIS data do not provide information on Swiss franc foreign lending (which is included in "others"), foreign currency lending clearly dominates international lending activities. For both Japan and Switzerland the dollar is the most important currency for international lending, but the share of the euro is higher for Switzerland.[5]

[4] Concerning revaluation effects see Lane and Milesi-Ferretti (2005).

[5] Therefore the assumption that Swiss international assets are only invested in euros is a simplification. Making the assumption that the euro is the investment currency for Switzerland reflects the fact that the Swiss franc exchange rate and Swiss monetary policy have responded sensibly to monetary policy

Table 1: Currency Composition of Cross Border Claims of Japan. and Swiss Banks

	Japan (JPY-based)		Switzerland (CHF-based)	
	Q4 2008	Q1 2015	Q4 2008	Q1 2015
USD	48.7%	56.5%	45.8%	54.5%
EUR	16.1%	12.1%	24.7%	16.1%
JPY	23.0%	18.5%	6.6%	3.3%
Other	12.2%	12.9%	22.9%	26.1%

Source: Bank of International Settlements. Cross border claims by currency denomination reported by banking offices located in the reporting countries and controlled by parents of the specified nationality.

In the augmented open interest rate parity, the exchange rate risk in case of international creditor and debtor relationships can be modelled by the risk premium φ. It is defined as the excess yield, which domestic or foreign creditors demand for facing exchange rate risk. The risk premium is assumed to be positive for debtor countries with foreign-currency denominated debt (Corsetti et al. 1999): Given that the foreign interest rate is exogeneous domestic investors have to pay a mark-up on interest rates to compensate foreign investors for default risk.

In case of foreign-currency denominated assets the risk premium on domestic interest rates is assumed to be negative, because an appreciation of the domestic currency reduces the value of foreign assets in terms of domestic currency (Goyal and McKinnon 2003, McKinnon and Schnabl 2004). [6] For instance, Japanese investors, who invest their savings in dollars, realize losses in the face of lasting yen appreciation. The higher the foreign-currency denominated assets, the higher is the potential appreciation pressure on the domestic currency. [7]

shocks in the euro area (see Figure 1). In addition, exchange rate stabilization of the Swiss franc has been against the euro (and less the dollar).

[6] What is dubbed „Conflicted Virtue" as a complementary expression to „Original Sin" as put forward by Eichengreen und Hausmann (1999). Countries such Japan, Switzerland and China are virtuous because of their high saving rates. The resulting current account surpluses and rising foreign-currency denominated international creditor positions create, however, the curse of persistent appreciation pressure and foreign exchange risk.

[7] There are two side conditions. First, the risk premium is only demanded by private investors. Public investors are likely to subordinate returns on investment to other goals such as stable exports and financial stability (i.e. employment). Second, the size of domestic assets matters (Lane and Milesi-Ferretti 2005). If the value of the domestic assets is rising (falling), the balance sheet risk for domestic households and financial institutions originating from foreign assets is softened (increased).

To compensate for this foreign exchange risk, US/German/euro area debtors have to pay a mark-up on the interest rate to Japanese and Swiss investors. Assuming that US and euro area interest rates are given (because the US and the euro area have the largest capital markets and Japan / Switzerland are only one of many investors in these capital markets), the Japanese and Swiss interest rates have to be lower to increase the incentive for private investors for holding risky foreign currency assets. This implies a negative risk premium φ on the domestic interest are:

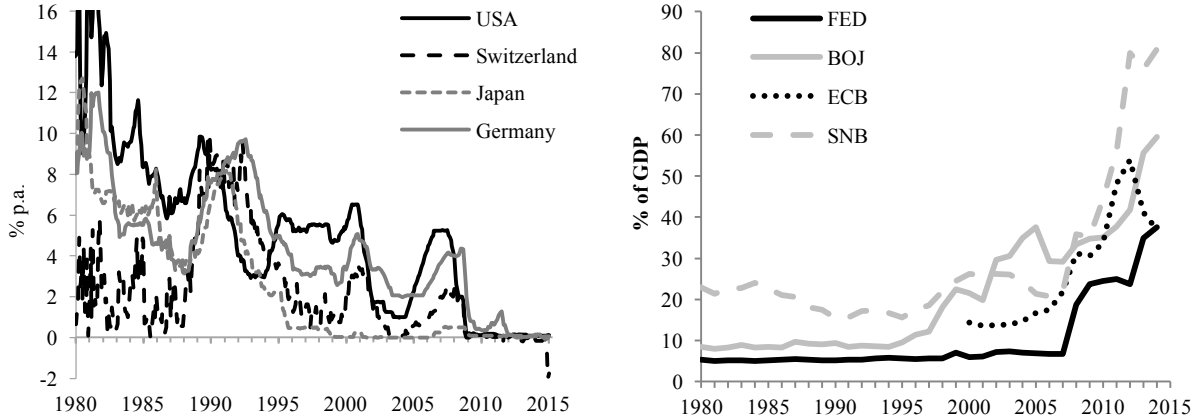
$$i_j - i_k = E(\widehat{e_{hl}}) + \varphi \qquad (2)$$

3. International Shock Absorption Channels

High positive net international investment positions, which are for instance in Japan equivalent to 70% of GDP and in Switzerland to 166% of GDP (2013), constitute an inherent appreciation pressure on the domestic currency. If these international assets would – for any reason – be converted into domestic currency, a strong appreciation would be the result. The upshot is that the foreign asset positions is a potential source of shocks with a negative impact on growth. This puts the stage for alternative channels of exchange rate shock absorption with different outcomes for domestic economic activity.

Appreciation expectations beyond what can be predicted based on the prevailing interest rate differentials can emerge for two reasons. First, the central banks in the centre of the world monetary system unexpectedly ease monetary conditions, what implies according to the monetary exchange rate model an appreciation of the periphery currencies. Since the mid 1980s, the Federal Reserve Bank and since the turn of the millennium also the European Central Bank have cut interest rates towards zero and have inflated their balance sheets (Figure 4). After the turn of the millennium, financial instability has played a growing role for monetary expansion in the US (Bernanke 2014) and more recently the euro area (Draghi 2014).

Figure 4: Short-term Interest Rates and Central Bank Balance Sheets



Source: IMF.

Second, official announcements of influential policy makers, central bank representatives or supranational institutions can cause sudden shifts in exchange rate expectations. For instance, with the September 1985 Plaza Agreement, the by then five largest industrial countries announced a substantial appreciation of the Japanese yen against the dollar to cure the trade imbalance between the US and Japan (Funabashi 1989). The announcement was supported by an interest rate increase by the Bank of Japan.

The result was a run into the Japanese yen, which made the yen appreciate far beyond the target value (McKinnon and Ohno 1997). Between September 1985 and February 1987 the yen appreciated by 50% against the dollar (Figure 2). During the early 1990s, representatives of the US government continued to talk the yen up to exert pressure on Japan in the context of the continuing US-Japanese trade conflict. The verbal intervention contributed to a strong yen appreciation until 1995 (McKinnon and Ohno 1997, Figure 2).[8]

Similarly, in January 2015, the announcement of floating the Swiss franc, which had been previously pegged tightly to the euro, initiated a run into the Swiss currency. As expectations had strengthened that the European Central Bank would embark on a large-size purchasing program for euro area government bonds (and other assets), an additional appreciation potential for the Swiss franc had emerged. Financial markets

[8] Most recently, in the context of Transpacific Partnership (TPP) negotiations US lobby groups have demanded a currency clause nested in the TPP agreement.

understood this reversal in exchange policy rate as a signal for franc appreciation. The Swiss currency appreciated within hours by up to 30%.

3.1. Shock Absorption via Exchange Rate Flexibility

Traditionally exchange rate flexibility has been regarded as a tool to absorb external real shocks and to ensure national independence in monetary (and fiscal) policy making (Friedman 1953, Mundell 1961). Given that for small open economies exchange rate flexibility is a source of uncertainty (and thereby less trade, investment and growth), exchange rate flexibility has been regarded as policy choice for large, comparatively closed economies (McKinnon 1963). Therefore, a floating exchange rate was chosen for Japan. Similarly, the decision of the National Bank of Switzerland to float its currency intended to generate Swiss monetary policy independence from the euro area.

However, floating the exchange rate in an environment, where large net foreign assets exist and global liquidity conditions are benign, can cause runs into the domestic currency. Such runs can make appreciation expectations self-fulfilling. If it is expected that the currency will appreciate, foreign assets will be converted into domestic assets. The domestic currency appreciates. Otherwise any individual investor would realize revaluation losses on its individual foreign-currency denominated portfolio. This trend will be enhanced, when speculators join or lead the market, hunting for exchange rate revaluations gains.

Carry trades set in, which are not only motivated by interest rate differentials between countries, but also expected exchange rate changes (Menkhoff et al. 2012).[9] After interest rate levels in most industrial countries have hit the zero bound, one-way bets on expected exchange rate changes can be assumed have gained a larger role for investment strategies. Speculators can be households, enterprises or financial institutions. If financial markets expect, that the domestic currency will be allowed to appreciate, foreign assets will be converted into domestic assets:[10]

[9] Whereas the arbitrage based on interest rate differentials has been dubbed carry trade, bets on exchange rate changes are called momentum.

[10] In equation (3) and (4) it is assumed that the demand for (supply of) the currency of the creditor country (D_l) (of the debtor country (S_l)) is a function of the expected future exchange rate and a vector X_d of any other exchange rate determinant: $D_h = f(E(e_{t+1}), X_d)$

$$If\ E(\hat{e}_{hl}) < 0, then\ dD_h > 0, dS_l > 0 \qquad (3)$$

By announcing the appreciation of the domestic currency the central bank may aim to gain monetary policy independence (as in Switzerland in early 2015) or to earn relief with respect to international pressure to appreciate the domestic currency (such as Japan in the 1980s and early 1990s, or China since 2005). This may generate a benefit for the central bank and/or the government. The costs will show up, however, by exchange rate-induced crisis. The overall welfare effect for the economy is uncertain. This is even more the case, when the desired monetary policy independence does not materialize (see 3.2 and Rey 2013).

For countries with large foreign currency denominated asset positions such as Japan, China and Switzerland[11], there are two transmission channels from appreciation to crisis. First, as in Dooley et al. (2004) the export sector faces losses. With prices in target markets being fixed in foreign currency (pricing to market) – usually in dollars or euros – profit margins of enterprises will shrink or turn negative (Mann 1986, Bernholz and Minsch 2015). If the appreciation is shifted fully or partially to prices in foreign currency, real exports and thereby profits will decline. In the longer run, export enterprises will be forced to cut domestic production (costs) to stabilize their profit margins. A negative growth effect for the country with the deteriorating terms of trade is generated. The Japanese coined for this adjustment process the term "high-yen induced recession".

Second, with foreign assets being denominated in foreign currency, a negative balance sheet effect is constituted. Private holders of foreign assets – households, enterprises and financial institutions – realize a revaluation loss. The deteriorating financial terms of trade

[11] Historically, large creditor countries have been able to lend in their own currencies because they had open capital markets and provided the principal vehicle currency for the international monetary system: they were "mature "creditors. Britain in the 19th century lent in sterling (backed by gold) on a massive scale throughout the world. For 25 years after World War II, the United States had large current account surpluses that were financed by making dollar loans to foreigners. In the new millennium, Germany, at the centre of the euro system, is a mature creditor country because it financed large shares of its current account surplus by lending abroad in euros. German financial institutions faced no currency risk for intermediating Germany's saving surplus internationally as long as its banks, insurance companies, pension funds, and so on – which are all funded in euros – build up euro claims on foreigners on the asset sides of their balance sheets.

trigger a balance sheet recession (Koo 2003, McKinnon and Schnabl 2006). As households feel poorer, they curtail consumption. Financial institutions get fragile, what implies negative spill-over effects to enterprises via a credit crunch (Ishikawa and Tsutsui 2005). For instance, Japanese insurance companies have accumulated large foreign-currency denominated assets, whereas their liabilities are in domestic currency. With this internal currency mismatch the equilibrium in Japanese financial markets is sensible to yen appreciation.

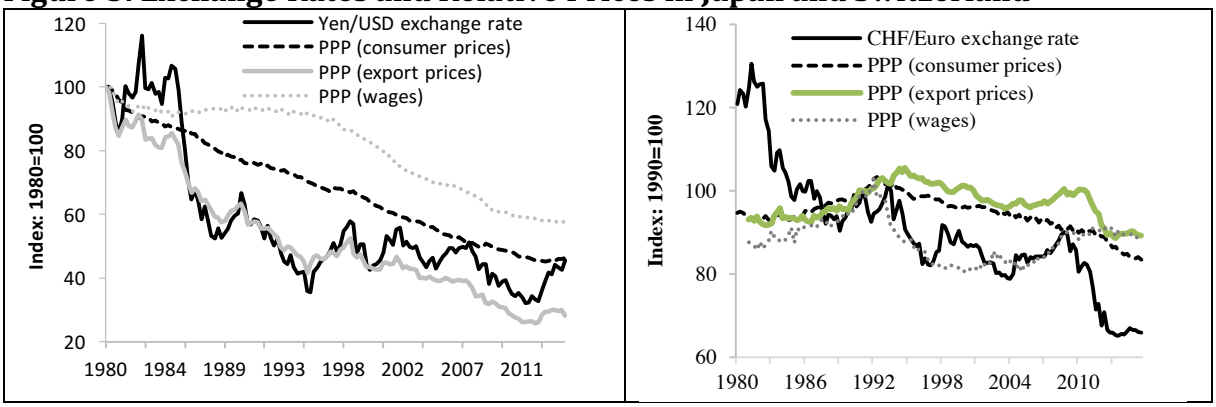
There is not necessarily a clear lower boundary on the appreciation of the currencies of international creditor economies (McKinnon and Schnabl 2006). Exchange rate changes can affect fundamentals, what can trigger a one-direction adjustment path as observed for Japan. If the appreciation of the domestic currency forces enterprises to cut costs and wages (Marston 1990), domestic prices are depressed. This effect is enhanced by an exchange rate-induced decline of prices for imported inputs and consumer goods. The price level of the country with the appreciating currency is declining relative to the anchor country. Ex post, with a substantial lag, purchasing power parity is realigned with the exchange rate at an appreciated level.

The left hand panel of Figure 5 matches the yen/dollar exchange rate with different concepts of purchasing power parity (PPP) based on relative consumer prices, export prices and nominal wages[12] for the country pair Japan-US. Relative export prices follow closely the exchange rate path due to different international pricing strategies of Japanese

[12] The negative business cycle effect of appreciation is further enhanced via exchange rate-induced (real) wage repression (McKinnon and Schnabl 2006). Based on Lindbeck (1979) the domestic nominal wage increase can be understood as a function of expected productivity gains corrected by expected exchange rate changes and a risk premium for exchange rate uncertainty. In export-dependent open economies, the competitiveness of the tradable goods sector is assumed not only to depend on productivity increases, but also on exchange rate changes. If, given a specific domestic wage level the exchange rate appreciates more than expected, the profit margins of export enterprises will turn negative. The additional exchange rate uncertainty originating in exchange rate fluctuations can be modelled by a negative risk premium in wage bargaining ψ (with ψ < 0). Assuming for simplicity that inflation is close to zero then: $\hat{w}_{Tj} = E(\hat{q}_T) + E(\hat{e}_{hs}) + \psi$ The desired growth in nominal wages of (skilled) workers in the traded goods sector $\hat{w}_T$is equivalent to expected productivity growth in the tradable sector E($\hat{q}_{Te}$) minus expected appreciation $E(\hat{e}_{hs})$ and minus the risk premium in the wage bargaining process. The negative risk premium on wages ψ becomes larger (more negative) when expected future volatility in exchange rates increases. If the exchange rate of the domestic currency would stay tightly pegged to the dollar, both the expected mean appreciation and the wage risk premium ψ would be zero. Nominal wage growth would then accurately reflect the ongoing growth in labour productivity. If, however, exchange rate uncertainty is high, domestic real wages can grow less, what implies a negative growth effect.

and US enterprises.[13] Despite considerable rigidities, relative consumer prices and relative wages have been following the exchange rate appreciation trend. Given an exogeneous appreciation shock, this suggests causality from the exchange rate to prices and wages. For Switzerland, a similar trend can be only partially observed versus Germany and the euro area. Starting from the early 1990s the relative price level versus Germany (euro area) has followed the appreciation trend of the Swiss franc against the German mark (euro). This trend is, however, not reflected in the relative wage levels since 2010 (right hand panel of Figure 6).

Figure 5: Exchange Rates and Relative Prices in Japan and Switzerland



Source: IMF. Index 1980=100 for Japan, 1990=100 for Switzerland.

Thus, depending on the exchange rate strategy, the country with a positive net external asset position at the periphery of the world monetary system may embark on a continuous deflationary path. This implies that the appreciation of a currency (against its potential anchor currency) has not necessarily a natural limit as it is evident from a long-term perspective for the Japanese yen and the Swiss franc (Figure 2). The exchange rate-induced crisis makes the nominal appreciation persistent, as soon as relative price and wage adjustments set in.

3.2 Shock Absorption via Discretionary Foreign Exchange Intervention

[13] US enterprises have been pricing their goods in domestic currency (i.e. dollars), with exchange rate changes being mainly shifted to foreign currency prices. In contrast, Japanese enterprises have tended to price their exports in foreign currency (dollars), taking the US price level as given.

Imminent recurrent exchange rate-induced crisis increases the probability of exchange rate stabilization. If interest rates in the anchor country are expected to decline, or – after interest rates have reached the zero bound – the balance sheet of the anchor country central bank is expected to grow, an appreciation of the periphery currency will be expected ($E(\hat{e}_{hl}) < 0$). The risk-adjusted domestic-currency return on foreign-currency assets may become negative ($0 > i_k + \widehat{e_{jk}}_e + \varphi$, for i_k=0: $0 > \widehat{e_{jk}}_e + \varphi$). Private domestic holders of foreign assets find holdings of foreign assets unprofitable and will convert foreign-currency assets into domestic-currency assets.

This puts pressure on the central bank to eliminate on exchange rate risk to restore the international portfolio equilibrium. Foreign exchange risk is reduced by transforming private foreign assets into public foreign assets. That process took place in Japan on a discretionary basis and to a limited extend up to the year 2004 (see for instance Ito 2007) and has considerably grown in scale in Switzerland since the year 2007. As shown in the left panel of Figure 7 in Switzerland net foreign assets as share of the overall net international investment position have increased from about 15% in 2006 to about 60% in 2014. Through foreign exchange intervention the central bank nationalizes net foreign assets and thereby absorbs foreign exchange risk. The potential revaluation losses of appreciation are shifted from the private to the public sector.

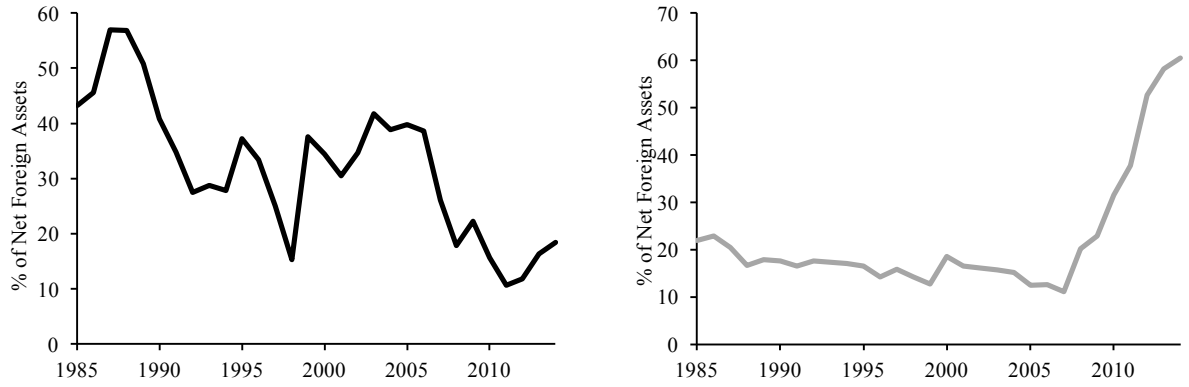
This implies, however, that central banks potentially realize revaluation losses from appreciation, what undermines their independence and thereby increases the incentive to cut interest rates (Löffler, Schnabl and Schobert 2012). Central banks can operate with negative equity. But if transfers of central bank profits to the government decline or the central bank has to be recapitalized, this can trigger political pressure on the central bank to ease monetary conditions. The likelihood increases, that central banks shield off capital inflows and appreciation pressure by interest rate cuts.

Interest rate cuts can be achieved by leaving foreign exchange accumulation unsterilized. The monetary expansion, which is accompanied by foreign currency purchases leads to a decline of interest rates. Capital inflows are discouraged what dampens appreciation pressure. Alternatively, sterilized foreign exchange intervention can signal future interest rate cuts with interest rates being cut without going the detour of foreign exchange

intervention. Once interest rate cuts have brought the money market rate to zero, exchange rate-appreciation expectations can be controlled by expanding the central bank balance sheet via unconventional monetary policy measures.

This has been the case in Japan since the turn of the millennium. The processs accelerated with the Abenomics since January 2013, as the Bank of Japan put depreciation pressure on the yen to revive inflation and growth in low-growth Japan. Since early 2015 the Swiss National Bank seems to have moved into a similar direction. From January to July 2015 the Swiss National Bank increased the foreign reserve holdings by an equivalent of roughly 95 billion euros. The target range for the 3-month Swiss franc libor was cut to -0,75%. After having fluctuated slightly around zero the overnight interest rate SARON (Swiss Average Rate Overnight) declined to -1.7% and later returned to a level of around -0.7%. Even the Swiss long-term interest rate (Bundesobligationen Eidgenossenschaft with 10-year maturity) has fallen below 0%.

Figure 7: Foreign Exchange Reserves as Percent of Net Foreign Assets



Sources: IMF, Swiss National Bank, Ministry of Finance Japan, Bank of Japan.

As shown in the right panel of Figure 4 the Bank of Japan balance sheet has grown faster than the balance sheet of the Federal Reserve Bank. The balance sheet of the Swiss National Bank has grown faster than the balance sheet of the European Central Bank. This can be seen as an attempt to increase the negative risk premium on domestic interest rates to induce private agents to rebalance portfolios towards foreign assets.

3.3 Shock Absorption via Horizontal Pegs

Interest rate cuts, which intend to shield off speculative capital inflows and soften appreciation pressure stabilize growth in the short term, but can be the source of unsustainable financial market exuberance and lasting crisis (Schnabl and Hoffmann 2008). In Japan, the excessive, self-reinforcing post-Plaza yen appreciation was finally stopped by substantial interest rate cuts by the Bank of Japan. This monetary expansion became the breeding ground for a speculation boom in stock and real estate markets – the so-called bubble economy. The bursting of the bubble in December 1989 became the starting point of a lasting crisis. Also in Switzerland in 2015 interest rate cuts below zero constitute an incentive to convert low-risk and (thereby) low-yield deposits into real assets such as real estate and stocks, thereby – possibly – contributing to unsustainable development in domestic financial markets.

Furthermore, the absorption of foreign exchange risk originating in large foreign asset positions via discretionary foreign reserve accumulation, discretionary interest rate cuts or discretionary expansion of central bank balance sheets has the downside that repetitive switching between a more or less credible independent monetary policy to (hidden) exchange stabilization causes uncertainty. Therefore, an alternative policy option is to prevent appreciation expectations to emerge from the very beginning. The central bank would not be faced with the task to encounter appreciation-induced recession.

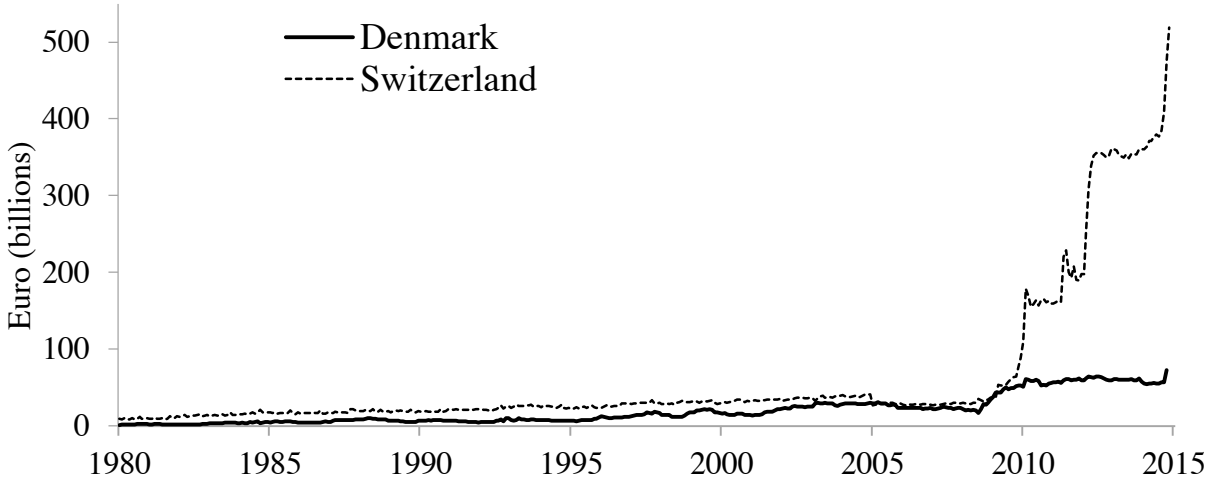
This implies multiple equilibria (Obstfeld 1986, 1994), which depend on how monetary authorities guide exchange rate expectations: (1) If the central bank signals appreciation, a self-fulfilling appreciation induced crisis as described in section 3.1 will occur. This crisis will sooner or later trigger foreign exchange intervention or outright interest rate cuts, which undermine the original goal to gain central bank independence via exchange rate flexibility (see 3.2. and Rey 2013). (2) Central banks at the periphery of the world monetary system are able to prevent appreciation expectations from emerging by credibly pegging the domestic currency horizontally to the anchor currency. This was for instance the case in Switzerland between September 2011 until early 2015. Then, the risk premium φ will not emerge ($E(\hat{e}_{hl}) = 0, \varphi = 0$) and appreciation-induced crisis will not

occur (as in equation (4)). The appreciation pressure, which is costly to control, once it has emerged, will not be born.

$$If\ E(\hat{e}_{hl}) = 0, then\ dD_h = 0, dS_l = 0 \qquad (4)$$

Figure 8 shows the foreign reserves of Switzerland and Denmark since 1980. Since the start of the European financial and debt crisis in 2008, the European Central Bank (and the Federal Reserve Bank) have taken several steps towards extensive monetary expansion. This has created for both the Swiss franc and the Danish krona a considerable appreciation potential. In this environment, Switzerland has primarily pursued a flexible exchange rate strategy but made policy reversals. In contrast, Denmark has kept since January 1999 the exchange rate of the krona tightly pegged to the euro within the institutional arrangement of the Exchange Rate Mechanism II.

Figure 8: Foreign Reserves of Switzerland and Denmark



Source: IMF.

As shown in Figure 8, foreign reserves have grown substantially faster in Switzerland than in Denmark with the most recent hike taking place in response to the announcement of the floating of the Swiss franc. This suggests that within an environment of globally benign liquidity conditions, eliminating exchange rate uncertainty in form of a horizontal peg helps to avoid best the accumulation of foreign reserves and the related risks for financial stability. The reason is that any induced appreciation would sooner of later force the

central bank to contain the run into the domestic currency by foreign exchange interventions and/or interest rate cuts.

4. Empirical Evidence

As shown above the exchange rate and monetary policy strategy in response to appreciation may matter for growth contingent on the international investment position. Given that large net foreign asset positions have in particular emerged in East Asia and Europe (as represented by Japan and Switzerland), a sample of East Asian and European countries is chosen. The larger sample creates sufficient degrees of freedom. With respect to East Asia we aim to particularly explore the time dimension, as since 1980 a growing number of countries followed Japan to accumulate large stocks of foreign assets. In Europe, information may be particularly extracted from the cross-country dimension, because the countries in the northern (southern) part of Europe have tended (until recently) to accumulate net (gross) foreign assets (liabilities).

4.1 Data and Estimation Framework

We collect data for 10 East Asian and 28 European countries. Table 1 provides an overview of the country sample., Table 2 an overview of all variables. As argued in section 3 different exchange rate strategies may have different impacts on real growth $\hat{y}_i$, which is used as an dependent variable. We calculate percent exchange rate changes against the anchor currency, i.e. (DM, euro) for the European countries and dollar for the East Asian currencies ($\hat{e}_{hl}$). A negative sign of this term represents exchange rate appreciation, a positive sign exchange rate depreciation. This term allows capturing the negative (positive) growth effects of appreciation (depreciation). A positive sign, i.e. negative growth effect of appreciation and a positive growth effect of depreciation are expected. A de facto measure for exchange rate flexibility is compiled based on the standard deviations of the year-over-year monthly exchange rate changes of the underlying year ($std(\hat{e}_{hl})$). [14] A negative sign is expected, as exchange rate stability is assumed to forestall appreciation-induced crisis.

[14] De jure measures tend to be biased by fear of floating (Calvo an Reinhart 2002). For a similar procedure see De Grauwe and Schnabl (2008).

Table 1: Country Sample

Austria, Belgium, Bosnia-Herzegovina, Bulgaria, Croatia, Czech Republic, Denmark, Estonia, Finland, France, Germany, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Netherlands, Norway, Poland, Portugal, Romania, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, United Kingdom.
China, Hong Kong, Indonesia, Japan, Malaysia, Philippines, Singapore, South Korea, Taiwan, Thailand

Two measures for international investment positions are used. First, net international investment positions (NIIP) are provided by the IMF World Economic Outlook as a measure for aggregated foreign exchange risk. In case of missing data accumulated current account positions (CA) are used instead. Second, assuming that all gross assets can be repatriated in the face of appreciation expectations, they are used as an alternative proxy for foreign exchange risk. A measure for capital controls is added (KA_OPEN), because capital controls are often used in East Asian countries as a substitute for exchange rate stabilization measures. Furthermore, a crisis dummy is constructed.

Table 2: Data Description

Acronym	Description	Source
CA	Current account balance in US dollars.	IMF World Economic Outlook Database
NIIP	Net international investment position in percent of GDP; missing values of NIIP approximated by $NIIP_{it} = \frac{1}{\text{GDP}_{\text{it}}} \sum_{s=1}^{t} CA_{is}$ (NIIP_approx).	IMF International Financial Statistics / World Economic Outlook Database
NPIP	Net private international investment position in percent of GDP.	IMF International Financial Statistics / World Economic Outlook Database
GPIP	Gross private foreign assets in percent of GDP.	IMF International Financial Statistics / World Economic Outlook Database
Res	Net foreign reserves in percent of GDP.	IMF International Financial Statistics / World Economic Outlook Database
e_{hl}	Exchange rate against the euro (in case of East Asian countries against the dollar); previous to 1999, exchange rates against the dollar are converted to exchange rates against the euro	Thomson Reuters / WM-Reuters / MSCI / Barclays Bank PLC / IMF International

	via exchange rate of the German mark to dollar and the euro conversion rate of 1.95583 German mark to euro.	Financial Statistics
$std(\widehat{e_{hl}})$	Standard deviations of the monthly year-over-year percent exchange rate changes	See above.
D_{NPIP}	Dummy for countries with positive net private foreign investment position in the year t.	
D_{Crisis}	Dummy for crisis years for individual countries.	
KA_OPEN	Index measuring a country's degree of capital account openness. *KA_OPEN* is based on the binary 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.	Chinn and Ito (2005). For more information on how the measure is constructed see Chinn and Ito (2008).

The starting point is 1980 for all western and southern European as well as East Asian countries because by then current account positions started to diverge. For all central and eastern European economies due to data availability 1995 is chosen as the beginning of the observation period (unbalanced panel). As a proxy for public net international investment positions net foreign reserves (Res) are used. By subtracting net foreign reserves from net and gross international investment positions we compile private net international investment positions (NPIP) and private gross international investment positions (GPIP). Gross private international investment positions, net private international investment positions and foreign reserves in dollars are normalized by dollar GDP.[15] The descriptive statistics for the overall sample are shown in Table 3.

We perform panel unit root tests for unbalanced panels to test for non-stationarity. The Fisher unit root test allows the autoregressive parameter to be panel specific and to account for country heterogeneity. The ADF-test allows including a drift parameter as the mean of each variable for each country is non-zero. Three lags are used and cross-sectional means are removed. In all cases the null hypothesis (all panels contain unit roots) is rejected at high levels of significance (against the alternative that at least one panel is stationary). The results do not change with varying lag-lengths.

[15] Lane and Milesi-Feretti (2001) use nominal exports for normalization. They argue that normalizing by GDP or alternatively by exports does not significantly change the econometric estimation results.

Table 3: Descriptive Statistics

Variable		Mean	Std. Dev.	Min	Max	Observations
growth	overall	3.27	3.94	-14.81	15.24	N = 1211
	between		1.90	1.01	9.80	n = 38
	within		3.42	-16.10	11.77	T-bar = 31.87
$\hat{e}_{hl}$	overall	3.32	36.38	-29.10	1148.17	N = 1127
	between		11.30	-1.44	66.87	n = 38
	within		35.14	-64.41	1084.61	T-bar = 29.66
$std(\hat{e}_{hl})$	overall	3.03	5.08	0.00	116.96	N = 1120
	between		2.31	0.18	10.86	n = 38
	within		4.50	-7.62	109.13	T-bar = 29.47
NPIP/ GDP	overall	-25.68	72.00	-692.41	228.82	N = 875
	between		60.45	-180.08	166.41	n = 38
	within		45.26	-538.00	108.36	T-bar = 23.03
NIIP/ GDP	overall	-8.76	78.02	-662.14	343.50	N = 878
	between		73.09	-167.09	252.29	n = 38
	within		43.76	-503.81	116.97	T-bar = 23.11
GPIP/ GDP	overall	331.51	1443.40	2.64	15175.84	N = 875
	between		1895.15	8.27	11733.82	n = 38
	within		268.72	-2680.72	3773.53	T-bar = 23.03

We estimate the following parsimonious models:

$$\hat{y}_{it} = \alpha_i + \beta_1\, \hat{e}_{hl} + \beta_2\, \frac{NPIP_{it}}{GDP_{it}} + \beta_3\, std(\hat{e})_{it} + \beta_4\, D_{NPIP} + \beta_5\, std(\hat{e})_{it} * D_{NPIP} + \beta_6\, \mathrm{D_{Crisis}} + \beta_7\, KA\_OPEN + \varepsilon_{it} \quad (5)$$

$$\hat{y}_{it} = \alpha_i + \beta_1\, \hat{e}_{hl} + \beta_2\, \frac{GPIP_{it}}{GDP_{it}} + \beta_3\, std(\hat{e})_{it} + \beta_4\, std(\hat{e})_{it} * \frac{GPIP_{it}}{GDP_{it}} + \beta_5\, \mathrm{D_{Crisis}} + \beta_6\, KA\_OPEN + \varepsilon_{it} \quad (6)$$

The Hausman test suggests a fixed effects model to control for country-specific time invariant effects in the estimation. We also control for time-fixed effects by adding time dummies. In equations (5) and (6) the real growth of country i in time period t is $\hat{y}_{it}$. The term α_i represents the time-invariant country fixed effects. The coefficient β_1 captures the impact of exchange rate changes on growth. The coefficient β_2 captures the impact of

the net (gross) private international investment position on growth. The net and gross foreign asset positions are interacted with the degree of exchange rate stability. The interaction terms take different forms.

As net foreign asset positions can have positive and negative signs a dummy variable D_{NPIP} is introduced. It has the value of one for countries with a positive net private international investment position in the year t (zero otherwise). In equation (5) the coefficient β_3 captures the impact of exchange uncertainty on growth of countries with negative net private foreign asset positions. The coefficient β_5 captures the difference for countries with positive net foreign asset positions. The sum of both coefficients $(\beta_3 + \beta_5)$ captures the overall impact of exchange rate volatility on growth for countries with positive net foreign asset positions.

In case of gross foreign asset positions as in equation (6), the coefficient β_3 captures the impact of exchange rate volatility on growth for zero gross foreign assets. The coefficient β_4 captures the marginal effect of the exchange rate volatility on growth for increasing gross foreign asset positions. The overall effect of exchange rate volatility on growth $\left(\beta_3 + \beta_4 \frac{GPIP_{it}}{GDP_{it}}\right)$ depends on the amount of gross foreign assets relative to GDP. In both equations, the coefficient β_5 controls for the effect of crisis on growth. The coefficient β_6 gives indication to what extend capital controls affect growth.

4.2. Estimation Results

Table 4 reports the estimation results for the estimation of equation (5) for net foreign asset positions. Model (1) reveals an unexpected sign for percent exchange rate changes (significant at the 5% level). Appreciations (depreciations) go along with (lower) higher growth. Model (2) suggests that for countries with a positive net private international investment position, growth is higher, but the coefficient is statistically insignificant. A higher degree of exchange rate volatility is associated with lower growth (model (3)). The respective coefficient of β_3 is statistically significant at the one percent level. However, estimating all variables together (model (4)) renders all variables insignificant.
The model (5) aims to disentangle the impact of exchange rate stability on growth dependent on the sign of the net international investment position by interacting the

proxy for exchange rate volatility with the dummy. The dummy is positive for countries with a positive net international investment position. The coefficient β_3 implies that higher exchange rate volatility is linked to lower growth for countries with negative net foreign asset positions. The coefficient β_5 captures the additional effect for countries with positive net international investment positions, which is not significantly different from countries with negative net international investment positions. The overall effect for countries with positive net international investment position is indicated by the sum of the coefficients β_3 and β_5. For all effects there no robust evidence for a systematic impact of exchange rate stability on growth contingent on the net foreign asset position.

As robustness test net foreign asset positions are substituted by gross foreign asset positions. This approach is estimated based on equation (6). The underlying assumption is that once appreciation expectations have emerged, all (gross) foreign assets may be reconverted into domestic currency. The results are presented in Table 5. The evidence in favour of a systematic impact of the exchange rate strategy on growth in the context of the gross foreign asset position is slightly stronger (see model (5)). The coefficient β_3 captures the effect of exchange rate volatility on growth when the gross foreign asset position is zero. The negative sign, which is statistically significant at the 5%-level indicates a positive impact of exchange rate stability on growth. The positive sign of the coefficient β_4 indicates that this effect is slightly smaller when gross foreign assets are added. The gross foreign asset position itself does not seem to have a significant impact on growth as indicated by the coefficient β_2.

GMM estimations with the own lags as instruments, which aim to control for possible endogeneity do not provide additional information. All in all, there is no robust evidence for a systematic impact of the exchange rate strategy on growth in the context of the international investment position. This may be due to the fact that low interest rates can have positive growth effects in the short-term and negative growth effects in long-term as experienced in the case of the Japan during and after the bubble economy. More research is needed to understand the long-term growth effects of exchange rate stability in the context of globally benign liquidity conditions.

Table 4: Fixed Effects Estimation Results (Net Foreign Assets)

Growth	(1)	(2)	(3)	(4)	(5)
Constant	6.5991***	0.1046	6.6199***	6.4668**	6.5108**
	(1.1152)	(2.8644)	(0.8123)	(2.0489)	(1.9023)
β_1	-0.0150**			-0.0054	-0.0045
$\hat{e}_{hl}$	(0.0042)			(0.0165)	(0.0163)
β_2		0.0029		0.0030	0.0030
$\frac{NPIP_{it}}{GDP_{it}}$		(0.0025)		(0.0031)	(0.0033)
β_3			-0.1428***	-0.0874	-0.1089
$std(\hat{e})_{it}$			(0.0233)	(0.0676)	(0.0855)
β_4					-0.4065
D_{NPIP}					(0.3096)
β_5					0.0809
$std(\hat{e})_{it} * D_{NPIP}$					(0.0741)
β_6	-5.4417***	-5.3873*	-4.4562***	-4.8146**	-4.7505**
D_{Crisis}	(0.8992)	(2.4278)	(0.6987)	(1.6472)	(1.5595)
β_7	0.8854	1.0859	0.2911	0.3791	0.3565
KA_OPEN	(0.6178)	(0.7525)	(0.5665)	(0.4890)	(0.4871)
$\beta_3 + \beta_5$					-0.0280
Prob > F					(0.4505)
Observations	1063	837	1056	820	820
R^2					
Overall	0.2751	0.2909	0.2915	0.3179	0.3202
Within	0.4284	0.4590	0.4613	0.5029	0.5043
Between	0.0598	0.2350	0.0675	0.1747	0.1723

Note: The dependent variable is growth and regressions (1) – (5) include a country fixed effect. Robust standard errors are reported in parentheses. The significance of coefficients is reported at the 10%, 5% and 1% level, indicated by *, **, ***, respectively. The time dummies are not reported for parsimony reasons. They are available on request.

Table 5: Fixed Effects Estimation Results (Gross Foreign Assets)

Growth	(1)	(2)	(3)	(4)	(5)
Constant	6.5991***	-0.2163	6.6199***	6.0923**	-0.8024
	(1.1152)	(2.8590)	(0.8123)	(2.0204)	(1.7999)
β_1	-0.0150**			-0.0043	-0.0030
$\hat{e}_{hl}$	(0.0042)			(0.0165)	(0.0156)
β_2		0.0003		0.0004	0.0003
$\frac{GPIP_{it}}{GDP_{it}}$		(0.0002)		(0.0002)	(0.0002)
β_3			-0.1428***	-0.1020	-0.1789*
$std(\hat{e})_{it}$			(0.0233)	(0.0624)	(0.0662)
β_4					0.0007**
$std(\hat{e})_{it} * \frac{GPIP_{it}}{GDP_{it}}$					(0.0002)
β_5	-5.4417***	-5.4153*	-4.4562***	-4.7340**	-4.1976**
$D_{Crisis_{it}}$	(0.8992)	(2.4612)	(0.6987)	(1.5944)	(1.2219)
β_6	0.8854	1.1822	0.2911	0.4942	0.6143
KA_OPEN	(0.6178)	(0.7110)	(0.5665)	(0.4967)	(0.5520)
Observations	1063	837	1056	820	820
R^2					
Overall	0.2751	0.2781	0.2915	0.2904	0.2738
Within	0.4284	0.4578	0.4613	0.5020	0.5106
Between	0.0598	0.2134	0.0675	0.1341	0.1568

Note: The dependent variable is growth and regressions (1) – (5) include a country fixed effect. The significance of coefficients is reported at the 10%, 5% and 1% level, indicated by *, **, ***, respectively. The time dummies are not reported for parsimony reasons. They are available on request.

5. Conclusion

Since the mid-1990s accompanying the rise of the US current account deficit, the number of countries exhibiting positive net international investment positions has increased. This has been particularly the case in East Asia, with Japan and China front-running and post-Asian crisis a growing number of smaller East Asian economies following. Also in Europe,

some countries such as Switzerland have accumulated large positive foreign asset positions. With respect to this phenomenon the theoretical part of the paper has made three main arguments.

First, within an asymmetric world monetary system, which implies an asymmetric use of currencies for international transactions and as stores of value, the degree of freedom for monetary and exchange rate policies at the periphery of the world monetary system is limited. This is even more the case, as very expansionary monetary policies in the centres of the world monetary system have created an extensive pool of liquidity for speculation. With interest rate levels in most industrial countries having reached similarly low levels, exchange rate speculation can be assumed to have gained a growing role for global speculation dynamics.

Second, self-enforcing speculation dynamics are likely to set in once appreciation expectations have been triggered (multiple equilibria). Therefore, for most countries at the periphery of the world monetary system the degree of freedom in monetary policy-making remains limited. This effect is even stronger for countries with large net foreign asset positions. The reason is that the deflationary effects of appreciation are transmitted via both the export sector **and** the financial sector to the real economy, with the financial sector gaining weight for economic development.

Thirdly, as experienced in Japan and Switzerland persistent appreciation expectations and exchange rate uncertainty depress the domestic interest rate level beyond the interest rate level of the anchor country. This increases the likelihood of speculative bubbles in domestic stock and real estate markets, as the returns on riskless assets such saving accounts, time deposits and government bonds are depressed. Becasue these bubbles have for a limited time period a positive effect on growth, the long-term growth effect is difficult to disentangle. As experienced in Japan, interest rate cuts, which aimed to shield of speculative capital inflows, can cause speculative bubbles. Therefore, in a world of abundant low cost liquidity shielding off speculative capital inflows by exchange rate stabilization is also a means of reducing the probability of speculative developments in domestic asset markets.

By keeping a tight / horizontal exchange rate peg to the anchor currency, policy makers can reduce the incentive for speculative capital inflows. The monetary effects which are caused by the expansion of the centre countries' central bank balance sheets have to be neutralized based on macro-prudential measures. Such measures can inter alia be restrictions on real estate transactions, increases in reserve requirements and other liquidity absorbing monetary policy measures. Many East Asian central banks have already accumulated respective experience.

References:

Bénétrix, Augustín / Lane, Philip / Shambaugh, Jay (2014): International Currency Exposures, Valuation Effects and the Global Financial Crisis. *NBER Working Paper* 20820.

Bernanke, Ben (2014): *The Federal Reserve: Looking Back, Looking Forward.* Speech at the Annual Meeting of the American Economic Association, Philadelphia, 3 January 2014.

Bernholz, Peter / Minsch, Rudolf (2015): Der "Franken-Schock: Die Freigabe des Schweizer Franken – wer gewinnt und wer verliert? *ifo Schnelldienst* 68, 5, 9-13.

Bordo, Michael / Humpage, Owen / Schwartz, Anna (2012): Epilogue: Foreign-Exchange-Market Operations in the Twenty-First Century. *NBER Working Paper* 17984.

Calvo, Guillermo; Reinhart, Carmen (2002): Fear of Floating. *Quarterly Journal of Economics* 117, 2, 379-408.

Chinn, Menzie (2005): The (Partial) Rehabilitation of Interest Rate Parity in the Floating Rate Era: Longer Horizons, Alternative Expectations, and Emerging Markets. *Journal of International Money and Finance* 25, 1, 7-21.

Chinn, Menzie / Ito, Hiro (2005): What Matters for Financial Development? Capital Controls, Institutions, and Interactions. *Journal of Development Economics* 81, 1, 163-192.

Chinn, Menzie / Ito, Hiro (2008): A New Measure of Financial Openness. *Journal of Comparative Policy Analysis* 10, 3, 309-322.

Corsetti, Giancarlo / Pesenti, Paolo / Roubini, Nouriel (1999): Paper Tigers? A Model of the Asian Crisis. *European Economic Review* 43, 7, 1211-1236.

Draghi, Mario (2014). *The Path to Recovery and the ECB's Role*. Speech at the Symposium on Financial Stability and the Role of Central Banks. Organised by the Deutsche Bundesbank, Frankfurt a. M., 27. 2.2014.

Eichengreen, Barry / Hausmann, Ricardo (1999): Exchange Rates and Financial Fragility. *NBER Working Pape*r 7418.

Flood, Robert / Garber, Peter 1984: Collapsing Exchange-Rate Regimes. Some Linear Examples. *Journal of International Economics* 17, 1-13.

Friedman, Milton (1953): The Case for Flexible Exchange Rates. In Friedman, Milton: Essays of Positive Economics, Chicago, London.

Funabashi, Yoichi (1989): *Managing the Dollar: From the Plaza to the Louvre,* Institute of International Economics, Washington D.C.

De Grauwe, Paul / Schnabl, Gunther (2008): Exchange Rate Stability, Inflation and Growth in (South) Eastern and Central Europe. *Review of Development Economics* 12, 3, 530-549.

Dooley, Michael / Folkerts-Landau, David / Garber, Peter (2004): The Revived Bretton Woods System. *International Journal of Finance and Economics* 9, 4, 307-313.

Goyal, Rishi and McKinnon, Ronald (2003): Japan's Negative Risk Premium in Interest Rates: The Liquidity Trap and the Fall in Bank Lending. *The World Economy* 26, 3, 339-363.

Ishikawa, Daisuke / Tsutsui, Yoshiro (2005): Has the Credit Crunch Occurred in Japan in the 1990s? *RIETI Discussion Paper* 06-E-012.

Ito, Takatoshi (2007): Myths and Reality of Foreign Exchange Interventions: an Application to Japan. *International Journal of Finance & Economics* 12, 2, 133-154.

Kappler, Markus / Reisen, Helmut / Schularick, Moritz / Turkisch, Edouard (2013): The Macroeconomic Effects of Large Exchange Rate Appreciations. *Open Economies Review* 24, 3, 471-494.

Koo, Richard (2003): Balance Sheet Recession: Japan's Struggle with Uncharted Economics and its Global Implications. New York: *Wiley and Sons*.

Krugman, Paul (1979): A Model of Balance-of-Payments Crises. *Journal of Money, Credit, and Banking* 11, 3, 311-325.

Kugler, Peter / Weder, Beatrice (2005): Why are Returns of Swiss Franc Assets so Low? *Mimeo*.

Lane, Philip / Milesi-Feretti, Gian Maria (2001): Long-Term Capital Movements. *NBER Working Paper* 8366.

Lane, Philip / Milesi-Feretti, Gian Maria (2005): A Global Perspective on Net External Positions. *IMF Working Paper* 05/161.

Lane, Philip / Milesi-Feretti, Gian Maria (2007): The External Wealth of Nations Mark II: Revised and Extended Estimates of Foreign Assets and Liabilities. *Journal of International Economics* 73, 2, 223-250.

Latsos, Sophia / Schnabl, Gunther 2015: Net Foreign Asset Positions and Appreciations Expectations on the Japanese Yen and the Swiss Franc. *CESifo Working Paper 5490.*

Levy-Yeyati, Eduardo / Sturzenegger, Federico / Gluzmann, Pablo 2013. Fear of Appreciation. *Journal of Development Eco*nomics 101, 233-247.

Lindbeck, Assar (1979): Inflation and Unemployment in Open Economies, Amsterdam, North Holland.

Löffler, Axel / Schnabl, Gunther / Schobert, Franziska (2012): Limits of Monetary Policy Autonomy and Exchange Rate Flexibility in East Asia. *Working Papers on Global Financial Markets* 48.

Marston, Richard (1990): Pricing to Market in the Japanese Manufacturing. *Journal of International Economics* 29, 3, 217-236.

McKinnon, Ronald (1963): Optimum Currency Areas. *American Economic Review* 53, 207-222.

McKinnon, Ronald (2013): *The Unloved Dollar Standard: From Bretton Woods to the Rise of China*. Oxford University Press.

McKinnon, Ronald / Ohno, Kenichi (1997): *Dollar and Yen: Resolving Economic Conflict between the United States and Japan.* MIT Press, Cambridge, Massachusetts.

McKinnon, Ronald / Schnabl, Gunther (2004): The Return to Soft Dollar Pegging in East Asia? Mitigating Conflicted Virtue. *International Finance* 7, 2, 169-201.

McKinnon, Ronald / Schnabl, Gunther (2006): China's Exchange Rate and International Adjustment in Wages, Prices, and Interest Rates: Japan Déjà Vu? *CESifo Studies* 52, 2, 276-303.

McKinnon, Ronald / Schnabl, Gunther (2009): The Case for Stabilizing China's Exchange Rate: Setting the Stage for Fiscal Expansion. *China & World Economy* 17, 1-32.

Mundell, Robert (1961): A Theory of Optimal Currency Areas. *American Economic Review* 51, 657-665.

Menkhoff, Lukas / Sarno, Lucio / Schmeling, Maik / Schrimpf, Andreas (2012): Currency Momentum Strategies. *Journal of Financial Economics* 106, 3, 660-684.

Obstfeld, Maurice (1986): Rational and Self-Fulfilling Balance-of-Payments Crises. *American Economic Review* 76, 1, 72-81.

Obstfeld, Maurice (1994): The Logic of Currency Crises. *NBER Working Paper* 4640.

Rey, Hélène (2013) Dilemma not Trilemma: The Global Financial Cycle and Monetary Policy Independence. *Mimeo*.

Takagi, Shinji (2015): *Conquering the Fear of Freedom: Japanese Exchange Rate Policy since 1945*. Oxford University Press, Oxford.