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International Liquidity Provision During the Financial Crisis: A View From Switzerland*

Raphael Auer
Swiss National Bank

Sébastien Kraenzlin
Swiss National Bank

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Abstract

We document the provision of CHF liquidity by the Swiss National Bank (SNB) to banks domiciled outside Switzerland during the recent financial crisis. What makes the Swiss case special is the size of this liquidity provision – making up 80% of all short term CHF liquidity provided by the SNB – and also the measures that were adopted to distribute this liquidity. In addition to making CHF available to other central banks via SWAP facilities, the SNB also allows banks domiciled outside Switzerland to directly participate in its REPO transactions. Although this policy was adopted for reasons that predate the financial crisis, during the crisis it proved tremendously helpful as it gave the European banking system direct access to the primary funding facility for CHF.

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* Raphael Auer, Swiss National Bank, Börsenstrasse 15, P.O. Box Ch-8022, Zürich, Switzerland. + 41-44-631-38-84. raphael.auer@snb.ch. Sébastien Kraenzlin, Börsenstrasse 15, P. O. Box, Ch - 8022 Zürich, Switzerland. + 41-44-631-31-11. Sebastien.Kraenzlin@snb.ch. The views in this paper are those of the authors and do not necessarily reflect the views of the Swiss National Bank, Federal Reserve Bank of Dallas or the Federal Reserve System.

1. Introduction

In the years leading up to 2007, banks across the globe had dramatically increased their balance sheet exposure to foreign currencies, which caused a corresponding increase in demand for cross-border liquidity. With the onset of the financial crisis and the successive drying up of interbank markets, the private sector no longer provided this liquidity, thus requiring a coordinated action by the world's major central banks.

In particular the provision of dollar liquidity to non-US banks by the Federal Reserve has received ample attention in the global financial press (for a discussion see, for example, Goldberg et al. (forthcoming)). Much less noticed was the case of the Swiss National Bank's (SNB) large scale provision of Swiss Franc (CHF) liquidity to the banking system across and beyond the European Union.

In this note, we document the extent of the CHF liquidity provision and describe the means by which it was provided. What makes the Swiss case special is not only the size of the liquidity provision to banks domiciled outside Switzerland (at times making up 80% of all short term CHF liquidity provided by the SNB), but also the adopted measures to distribute this liquidity.

In addition to providing CHF to other central banks via SWAP facilities, the SNB also allows foreign banks to directly participate in their REPO market. Although this policy was adopted for reasons that predate the financial crisis, during the crisis it proved tremendously helpful as it gave the European banking system direct access to the primary funding facility for CHF.

Last, the Swiss case is exceptional since between March 2009 and June 2010, faced with deflation risks and zero interest rates, the SNB intervened in the foreign exchange market as part of its unconventional policies. The resulting large scale inflow of CHF to the financial sector flooded the international banking system with CHF liquidity, an effect so big that the need for liquidity funding in the SNB's liquidity providing open market operations virtually ceased to exist. Thus, although not an objective of the foreign exchange interventions in itself, they may have contributed to stabilizing the European banking system.

2. The Origins: CHF Loans in Austria and CEE

Owing to the traditionally low interest rates in Switzerland and the low exchange rate volatility observed since the introduction of the Euro, many households and firms across Central and Eastern European (CEE) relied on CHF-denominated loans as a source of cheap funding. The resulting aggregate exposure was substantial: by early 2009, households and

non-banking sector firms in CEE economies had accumulated the equivalent of CHF 120 billion worth of debt denominated in Swiss currency. In Austria, mostly due to its proximity to Switzerland, total exposure was then worth over CHF 80 billion. Also non-banks in the other richer countries of the Euro Zone relied on such loans and the total exposure of non-Banks Swiss European banks amounted to around 400 billion CHF in late 2008.

The size of the exposure has raised many concerns regarding the financial stability of the banking sector in case of continued CHF strength, most notably by Krugman (2009). Since few of the debtors have any CHF income, such an appreciation could cause large-scale default and the resulting loan losses could put at risk the banking sector in these economies under strain.[1]

However, a second financial stability concern related to the CHF loans has received surprisingly little attention (with the notable exception of Pann et al. (2010)), namely the resulting funding and liquidity risk that non-Swiss banks face. After all, CHF-denominated loans are cheaper than non-CHF currency-denominated loans because non-Swiss banks can obtain cheap CHF funding themselves.

3. Systemic CHF Shortages During the Crisis

CHF denominated loans obtained by non-banks outside Switzerland are typically granted by non-Swiss banks, who in turn finance themselves by borrowing from financial institutions in Switzerland. As is the case in all bank business, these non-Swiss banks give out long term loans, yet finance themselves on a short term basis. Their ability to roll over maturing CHF positions came under stress when the interbank money market successively dried up following the onset of the financial crisis in August 2007 and, in particular, after the collapse of Lehman Brothers in September 2008 (see Guggenheim et al. (2011)).

In international currency markets, any bank can potentially obtain financing in any foreign currency by either directly going to the interbank money market or by obtaining funds from its central bank and swapping the received funds into the foreign currency. In principle, the latter two ways should ensure that irrespective of the market where a currency is lent from one bank to another, the rate at which this is done is the same.

[1] The aggregate exposure of CEE and Austria to low-interest rate currencies had already caused losses of around 60 billion USD for these nations in 2008-2009 alone, see Auer and Wehrmüller (2009). Note that empirical studies by Brown et al. (2009) and Puhr et al. (2009) show that the debtors tend to be rather solvent, so that these concerns are less relevant than the sheer magnitude of the exposure suggests.

During the recent financial crisis, however, interbank money markets have *temporarily* not functioned smoothly. For example, Figure 1 documents the strains in the CHF money market arising in October 2008. The figure plots the difference between the unsecured and secured overnight interbank rate for CHF funds. While these two spreads are historically rather low and co-move closely, the spread on CHF rose steeply during October 2008, reaching values up to 300 basis points. Figure 1 also plots the spread between the unsecured and secured overnight interbank rate for euro funds, where no such spike occurred.

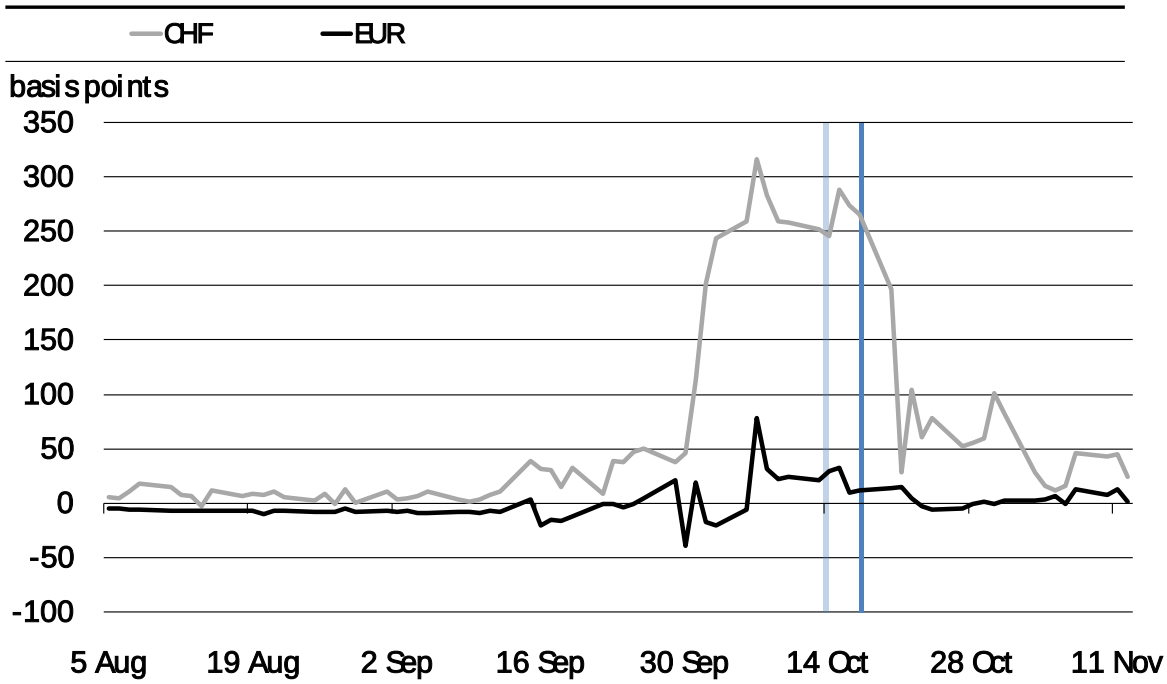

Figure 1 plots the evolution of the difference between the unsecured and secured overnight interbank rate for CHF funds and for euro funds from August to November of 2008. The two horizontal lines correspond to the announcement (bright blue line) and the actual start (dark blue line) of CHF auctions by the ECB, MNB, and NBP. Source: See Auer and Kraenzlin (2009)

The CHF specific spike in the cost of obtaining unsecured funds was caused by a combination of the need of banks domiciled outside Switzerland to continuously roll over maturing interbank loans and the drying up of supply for these funds. In a calm market environment, all Swiss domestics banks, as well as a considerable number banks of domiciled outside Switzerland that do have access to the Swiss REPO system, would have immediately exploited this profit opportunity and provided unsecured funds to banks without access to the REPO system.

However, against the backdrop of the global financial crisis and the fear of counterparty default risk, this did not happen and the spread between secured and unsecured CHF funds remained elevated for several trading days. Without access to the Swiss Repo system, even banks with ample collateral could not obtain secured funding, as the SNB was not able to provide liquidity directly to these banks.

The problems in the cross-border interbank market could have posed a substantial danger to the stability of the financial sector at large. If the Swiss banking system was no longer willing to supply liquidity to banks across the euro zone and CEE, non-Swiss banks in turn could try to reduce their exposure by liquidating CHF loans they had given out to their clients. Given the tensions in banking at the time, this would have driven many debtors into default, and could have started a process of unorderly wind down of CHF loans, with increasing default rates implying the need for additional loan-loss provisions and thus increasing pressure to liquidate CHF exposure. This vicious cycle could have had dire consequences for the banking system and the real economy.

4. Phase I: Inter Central Bank SWAP Facilities

The drying up of liquidity distribution in foreign currency posed a problem more challenging than the breakdown of the domestic interbank money market: no central bank can on its own provide liquidity in a foreign currency. First, the European Central Bank (ECB) and the central banks in CEE obviously cannot create CHF liquidity. Second, the SNB can create Swiss Franc liquidity but not supply this liquidity to banks that do not have access to the Swiss Repo System or banks that do not have sufficient SNB eligible collateral, which in 2007 was the case for most banks involved in CHF-denominated lending in CEE.[2]

To overcome this market friction, the SNB jointly announced with the ECB and subsequently with the Narodowy Bank Polski and the Magyar Nemzeti Bank that all these central banks would directly distribute CHF denominated funds to their counterparties. Since nearly all banks who have to fund some CHF exposure are registered with one of the four central banks and also since the conditions at which these funds are auctioned are similar across these countries, in effect the private sector instantly gained access to the primary source of CHF, the SNB.[3]

[2] In general, the establishment of access to the Swiss REPO system takes several months. Hence, banks with Swiss franc exposure but no access to the Swiss REPO System could not establish access in mean time.

[3] The Hungarian Central Bank offered slightly different conditions. See Goldberg et al. (2010) and Aizenman and Pasricha (2009) for a discussion of various SWAP line agreements around the globe

As can clearly be made out from Figure 1, on the value date of the first SWAP transaction, the CHF tensions in the unsecured money market ceased once the first CHF auctions were implemented by the partner central banks.

Figure 2 documents the extent to which banks domiciled in the European union used the SNB-ECB SWAP facility. Starting with the introduction, demand for CHF in the Euro Zone immediately jumped to around CHF 40 billion and stayed there for around half a year. Thereafter, demand for the money from this facility levelled off and ceased during January 2010.

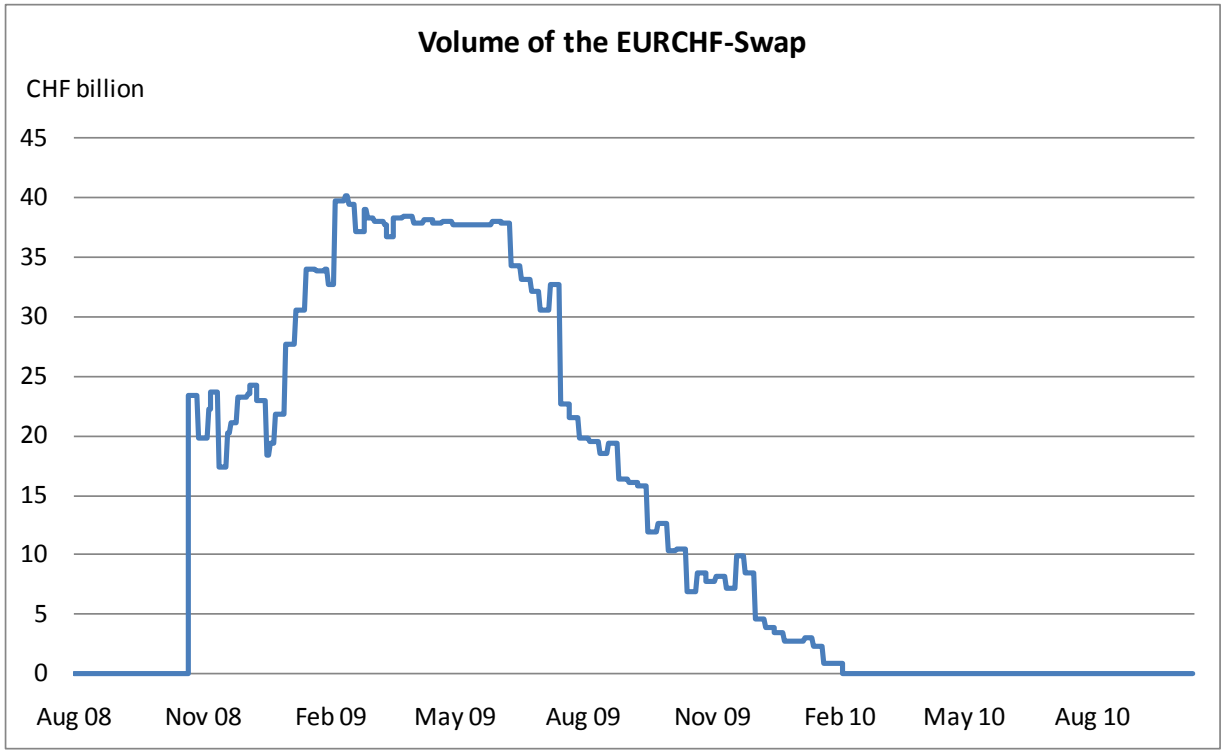

Figure 2: Volume of CHF Delivered to Euro Zone Banks Via the SNB-ECB Swap Facility

5. Phase II: Enhancing Foreign Banks' direct access to the REPO System

Figure 1 demonstrates that the SNB-ECB SWAP was a functioning measure to address short run liquidity mismatches. Since they are just a means to distribute liquidity more effectively, they involve no direct costs, but they still have limits. First, their maximum volume is agreed upon in advance so that they are not as flexible as measures controlled by only one central

bank. Second, the SWAP agreement itself to some extent fractionalizes the market for CHF liquidity since the total supply of CHF is split across different selling platforms.[4]

Last, they involve also some loss of control over monetary policy since in essence, the monetary base is partly controlled by a foreign central bank. The main worry of policymakers is that such SWAP agreements could create inflationary pressure since opening new means to distribute liquidity can increase the total supply of money. For example, the maximum amount of a SWAP is being agreed upon for several months in advance. Since the receiving central bank may auction off the maximum amount but is not obliged to do so, the uncertainty in the growth of the money supply is increased.[5]

Given these shortcomings, the SNB, the ECB and the Euro Zone member central banks, as well as all other affected central banks advised banks with major exposure to the CHF to seek access to the SNB's REPO system.[6]

The SNB is by law empowered to hand out liquidity also to banks domiciled outside Switzerland.[7] The original intention of allowing foreign banks to access the Swiss REPO system was to reduce the dependence on the few large Swiss financial institutions, to improve the general liquidity, and to thereby facilitate the steering of a longer term money market rate, namely the 3-months Swiss franc LIBOR.

This pre-crisis policy also proved useful in addressing cross-border liquidity shortages during the financial turmoil. The black solid line in Figure 3 plots the evolution of the number of banks in the REPO System that are domiciled outside Switzerland (right axis). As of mid November 2010, 59 such banks had established access to the Eurex Repo electronic trading platform, a necessary condition to participate in the SNB's repo auctions. Of these 59 banks, 23 where domiciled in Austria, 16 in Germany, and 6 in the UK.[8]

[4] A further potential worry is that these agreements could entail a larger counterparty default risk. This is not the case. First, there is no risk involved for the central bank handing out the funds, since the receiving central banks guarantee these transactions. Second, there is also no effect on counterparty default risk for the receiving central bank since it transacts with its regular counterparties against the regular collateral basket.

[5] There are, however, two main reasons why the loss of monetary supply is rather contained. First, the central bank that is originating the funds can sterilize the effect on the monetary supply by issuing own debt certificates or conducting liquidity absorbing open market operations. While giving away some control over monetary policy to other central banks is of little concern in the current low-inflation environment, such concerns will definitely become a first order political topic once inflationary pressures pick up and central banks have to refocus on their core task of maintaining price stability.

[6] In particular, the Austrian financial authorities (Austrian National Bank and the Finanzmarktaufsicht) have assumed a key role in persuading commercial banks in Austria to seek access to the Swiss Repo system.

[7] The REPO system that the SNB uses is also the same system where the majority of interbank CHF repo transactions are concluded. Hence, even banks without access to the SNB could use the interbank repo market for refinancing purposes.

[8] The SNB also accepts securities denominated in foreign currency. High credit standards as well as a highly efficient risk management procedure eventually imply that the SNB does not apply haircuts. Banks domiciled

Figure 3 also documents the volume of CHF liquidity that these foreign-domiciled banks obtained directly from the SNB. The latter volume (blue solid line, see left axis) temporarily exceeded CHF 50 billion.

To make clear just how sizeable the foreign demand for liquidity is, Figure 3 also documents the volume of CHF liquidity that was obtained from the SNB via the REPO system by Swiss banks. During nearly all months in 2009 and also in early 2010, well over 70% of all liquidity demand actually came from outside Switzerland. Add to this the money obtained indirectly via the SNB-ECB swap implies that at times, nearly 90% of short term CHF liquidity was held by non-Swiss Banks.

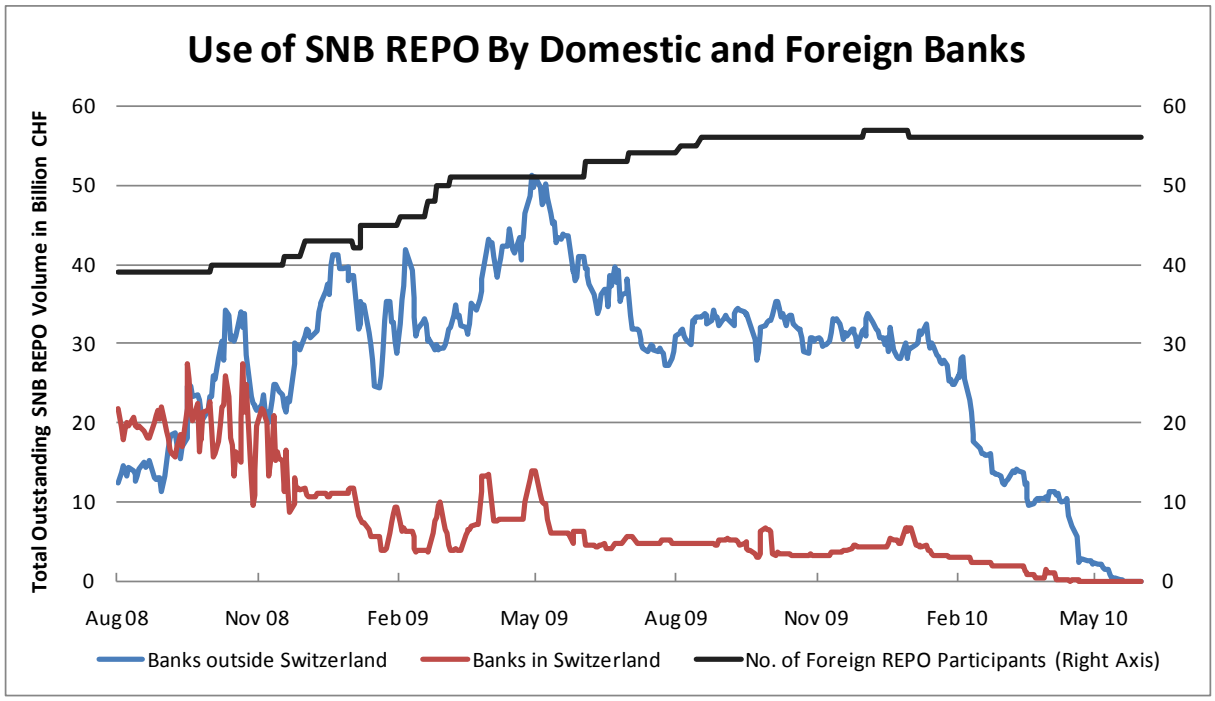

Figure 3 Use of SNB REPO by banks domiciled in and outside Switzerland

Figure 4 again underpins the importance of direct access to the SNB's REPO system for banks domiciled outside Switzerland (see also Kraenzlin and von Scarpatetti (2011)). This figure presents an area diagram (stacked) showing total provision of CHF liquidity to banks domiciled outside Switzerland. The volume supplied via the REPO system (in red) and the volume supplied via the SNB-ECB Swap (in blue).

outside Switzerland thus have the possibility to repo out non-CHF denominated securities with the SNB. It is unclear to what extent this possibility has contributed to the high use of the SNB REPO facility by this group of banks observed during 2009 and early 2010.

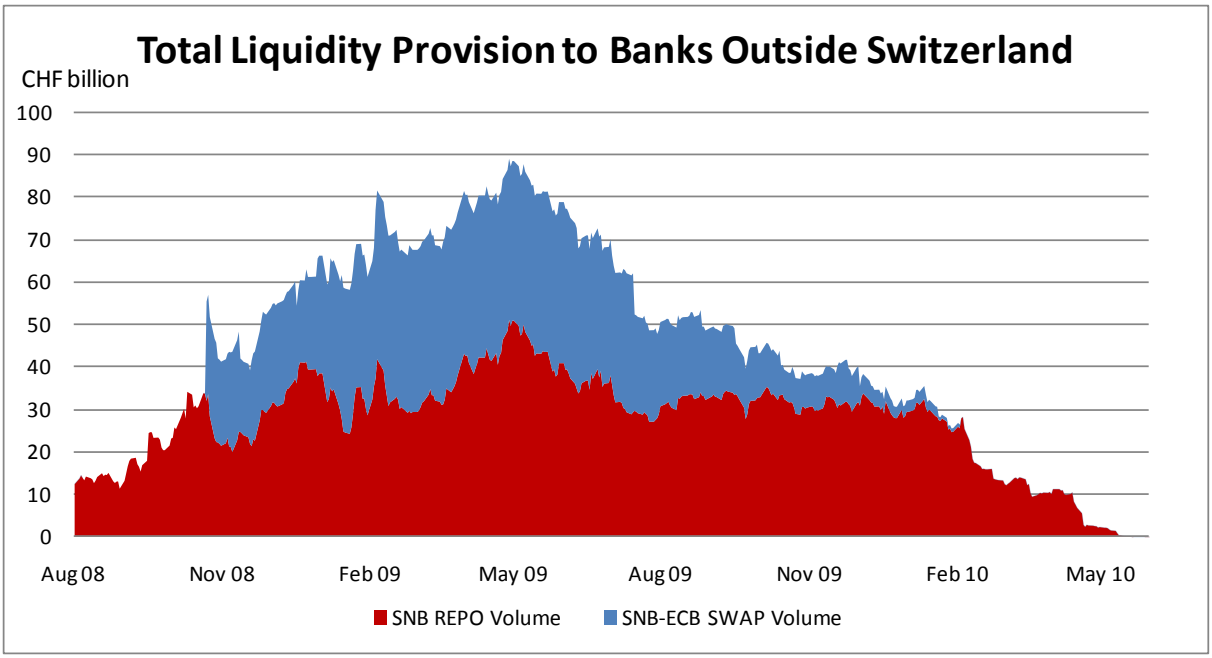

Figure 4 Total liquidity provision to Banks domiciled outside Switzerland

6. Phase III: Exchange Rate Interventions

Figures 3 and 4 document the extent of the CHF shortage during 2008 and 2009, but also, that this demand decreased substantially staring in mid 2009; it even vanished completely in mid 2010. Although one might be tempted to attribute this to a resurgence of activity in the interbank money market, this is not fully the case.

Rather, starting in March 2009, the SNB intervened in the foreign exchange market, eventually building up a foreign reserve position worth over CHF 200 billion, compared to a pre-2009 level of less than CHF 50 billion.

While the exchange rate interventions were part of the SNB's unconventional measures to avert deflation risks in Switzerland, an unintended side effect of the interventions was the resolution of the international CHF liquidity shortage: the 150 billion of additional CHF supply is now available to banking system and consequently, the majority of banks are awash with CHF liquidity.

Figure 5 puts the extent of the liquidity provision via the exchange rate interventions in perspective. The figure displays the total supply of CHF liquidity supplied to both banks domiciled in- and outside Switzerland together. The three key elements of this supply are the

Swiss REPO system (blue area), the EURCHF-Swaps (red area), and last, the SNB exchange rate interventions (green area).[9]

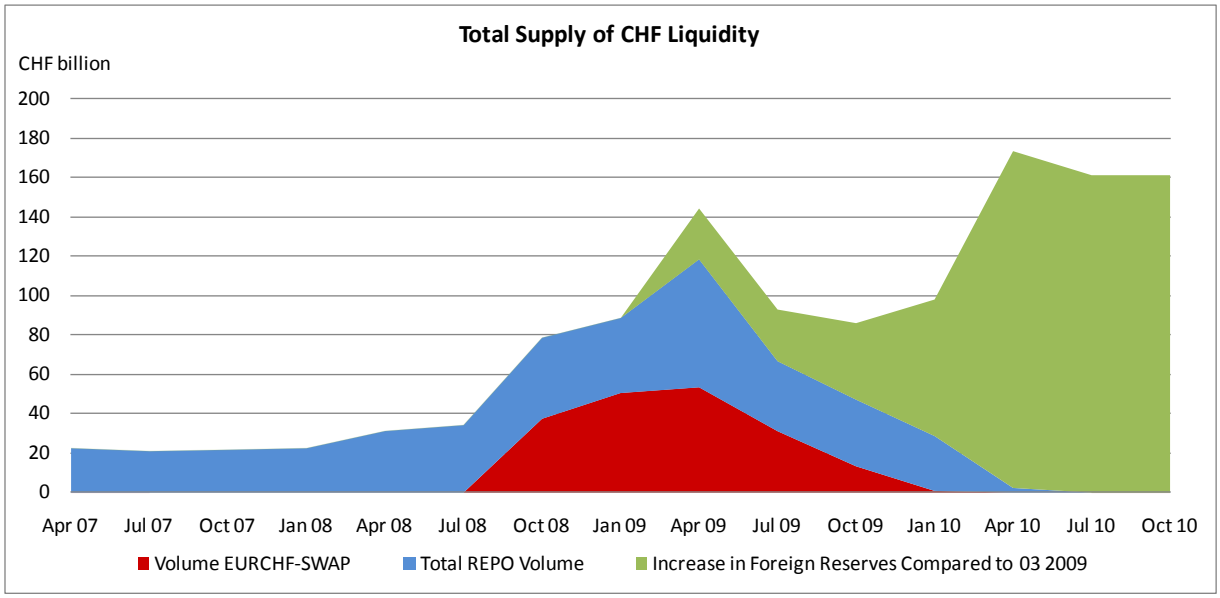

Figure 5: Total Supply of CHF Liquidity

Figure 5 documents that the exchange rate interventions where so sizeable that they in effect created enough liquidity so that demand for liquidity via REPO and SWAP transactions ceased to exist altogether. In fact, currently the SNB absorbs liquidity to implement monetary policy. This is done, on the one hand, through weekly issuance of the SNB's own money market bills (SNB Bills) and on the other through daily one-week REPO auctions.

The exchange rate intervention were thus also helpful from a financial stability perspective. Using loans denominated in a low interest rate currency such as the CHF is in essence a carry trade strategy. Such strategies are always subject to a certain danger of a disorderly unwinding of positions: if the losses stemming from an appreciation of the CHF become too large such that counterparty default risks surface, carry traders can no longer re-finance their positions and have to liquidate them; this, in turn, causes a further appreciation of the CHF. The combination of SWAP facilities, enhancing direct access to the primary source of Swiss franc liquidity, as well as the exchange rate interventions were instrumental in making sure that such sizable unwinding of positions did not take place to date and is also unlikely to happen in the near future.

[9]Data on the level of reserves is collected from the SNB's statistical monthly bulletin.

7. Conclusion

When liquidity demand spikes, small frictions in the private sectors' way to distribute liquidity internationally can have large effects on the interest rate paid.

The rapid, coordinated, and large policy response by central banks across Europe may has avoided an unorderly winding down of the carry trade positions that European households and firms had built up in the years leading up to the crisis.

International liquidity mismatches involving Swiss francs are currently of little concern, which may be an unintended side effect of the liquidity injection via the SNB's interventions in the foreign exchange market. At the current juncture, the private sector thus has won time to reduce its CHF exposure in an orderly way.

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