Foreign exchange interventions as an (un)conventional monetary policy tool

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Abstract

The zero level of interest rates constitutes a limit of this standard monetary policy instrument. Based on the example of the Czech Republic we argue that in such a situation foreign exchange interventions represent a meaningful monetary policy tool for small open economies not facing serious liquidity problems. Existing studies also suggest that potential financial losses of central banks stemming from the buildup of international reserves do not necessarily compromise credibility or the ability to pursue monetary policy objectives. We provide an overview of the evidence on the functioning of FX interventions and the exchange rate pass-through to consumer prices. Using simulations which take into account the existence of the zero lower bound, we argue that in such a situation the pass-through can be much larger than the existing evidence suggests.

Keywords: FX interventions, exchange rate pass-through, zero lower bound, central bank loss, inflation targeting

JEL classification: E42, E52, E58, F31

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Introduction

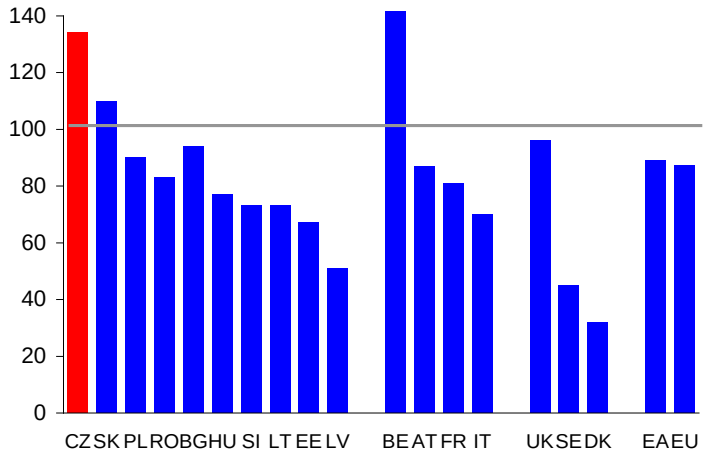
The latest, but lasting, economic difficulties have prompted a prolonged period of monetary easing. A significant number of (important) central banks have lowered their rates in response to the crisis in order to mitigate its consequences and meet their monetary (and other) goals and have announced that they expect rates to be at low levels for a significant period of time. The dismal status of the financial sector has also prompted the use of other, unconventional, tools in order to boost liquidity and maintain the stability of particular segments of the financial sector.

The long-lasting economic stagnation has thus left a number of central banks facing the limits of their standard monetary policy instrument, for policy interest rates are often approaching the zero level. Depending on the particular situation of their economy and financial sector, central banks have turned their attention to various unconventional monetary policy measures, such as a negative interest rates on deposits (as used, for example, by the National Bank of Denmark and the Swedish Riksbank), various forms of liquidity provision through quantitative or qualitative easing, and foreign exchange interventions.

The Czech National Bank (CNB), an inflation-targeting central bank, has also approached the zero level. However, the position of the CNB and the situation of the Czech financial system are rather dissimilar to those faced by the Fed, the BoE, or the ECB. The major difference determining the choice of another monetary instrument in the Czech Republic is neither the size of the economy nor the magnitude of the economic downturn. Whereas most economies have been hit by a severe liquidity crisis and a subsequent credit crunch as a result of the global financial crisis, the Czech financial system is characterized by an abundance of liquidity. Its source was and is the inflow of foreign exchange into both the private and public sectors. Not only is the ratio of deposits to loans well above the EU average (see Figure 1), but total deposits exceed total loans. The significant excess liquidity is absorbed by the CNB using repo tenders.

Ratio of deposits to loans — Figure 1

Ratio of deposits to loans granted in selected EU countries
(%; end of 2011; deposits/loans to residents)



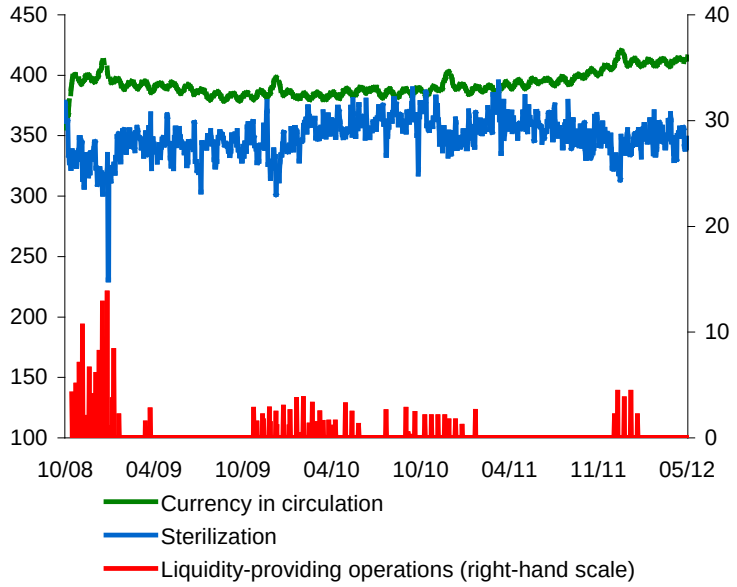
Source: ECB

In 2008, on the eve of the crisis, the CNB even introduced liquidity-providing repo operations, but they were used only very rarely (Figure 2) despite having an important psychological effect. However, due to an excess of liquidity, the introduction of a liquidity-providing program along Fed, BoE, or ECB lines cannot be expected to have a significant impact, if any, on the Czech economic situation.

Open market operations

Figure 2

Open market operations and currency in circulation
(CZK billions)



Source: CNB

Experience with negative deposit interest rates is very limited and their economic consequences are in general very unclear. Moreover, in some pieces of legislation in the Czech Republic, penalty interest is bound in a multiplicative manner to the discount rate. This may lead to severe legal complications if the rate is lowered beyond zero. In addition, the general legislation forbids negative interest rates in certain types of contracts.

As a consequence, foreign exchange (FX) interventions have been selected as the most appropriate monetary policy tool when interest rates hit the zero bound and cannot be lowered any further. Moreover, given that the Czech economy is very open and FX interventions are among the standard instruments of monetary policy, it seems only logical to choose them over the alternatives.

On November 1, 2012, the CNB lowered the two-week repo rate – its key monetary policy rate – to "technical zero" (0.05%). Following an internal debate about the other monetary policy instruments, outlined above, that could be used for further monetary easing, the Bank Board decided that FX interventions would be used where necessary to lower the value of the Czech koruna, and it decided to publicly communicate the choice of this instrument well in advance in order to transparently reduce the market uncertainty about the looming zero-rate threshold, and to maintain its ability to influence monetary-policy relevant inflation and

inflation expectations in the event of a prolonged recession and a need for further monetary easing.

Today, many central banks use inflation targeting (IT) as their means of achieving and maintaining price stability. The CNB switched to inflation targeting in 1998 and has earned a high level of credibility since then. In recent times, the CNB has been highly ranked for its transparency.

Under inflation targeting, the monetary policy tool is the interest rate. The exchange rate is not a tool, but rather an endogenous variable affecting future inflation expectations. The crucial general issue when dealing with FX interventions is therefore the question of their compatibility with inflation targeting. Is influencing FX contradictory to IT? Leaving aside technical and procedural compatibilities, does it compromise the credibility and goals of the central bank? IT theory also states that FX interventions can have an impact only through expectations about depreciation/appreciation of the country's currency or about its risk premium.

The IT theory gives very little, if any, guidance on FX interventions. On the contrary, it assumes, and usually recommends, pure floating with no role for exchange rate management, because in this framework monetary policy affects the exchange rate through the interest rate. The only way in which the exchange rate enters the whole process is by the future inflation forecast's influencing the interest rate.

And it is exactly this implicit reaction of monetary policy to exchange rate shocks that leads one to question FX interventions under standard conditions. Why intervene in the FX market if we have another monetary variable, the interest rate, at hand? Such behavior cannot be credible, since it contradicts the fundamentals of IT.

Under standard conditions, an unexpected depreciation shock eases the monetary conditions. However, in such a situation the interest rate is increased in order both to give the currency an upward push and to tighten the easier monetary conditions directly. The important consequences are that:

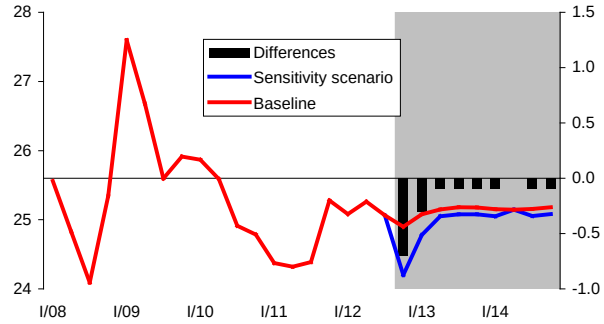
1. the implicit reaction of the monetary policy instrument strongly affects our ability to estimate the true effects that FX interventions have on macroeconomic variables; and
2. in the situation of a zero lower bound, appreciation shocks cannot be accommodated by a standard interest rate cut to ease the tighter monetary conditions caused by the exchange rate shock.

Figure 3 shows an example of the effects on the Czech economy of a 3% exchange rate shock under the standard situation (with no zero bound, and hence with an accommodating monetary policy tool). This exercise is commonly used as a sensitivity scenario by the CNB in its inflation reports. The graphs reveal only a very modest reaction to the exchange rate shock in terms of either CPI inflation or GDP growth.

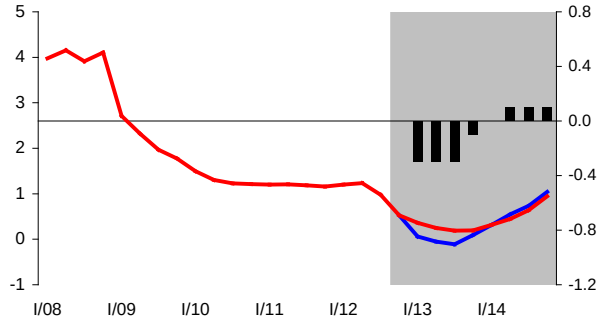
The crucial question is to what extent the results of the exchange rate fluctuations shown hold for the effects of FX interventions on the Czech economy if the need arises to use them to further ease monetary policy. In addition, what is the international and Czech experience with FX interventions? Can we build on that experience, or does everything change as we hit the zero lower bound on nominal interest rates? In the following sections we will try to shed some light on the issues inevitably raised by such questions, in line with the argument outlined above.

The CNB's exchange rate sensitivity scenario (a 3% appreciation shock) Figure 3

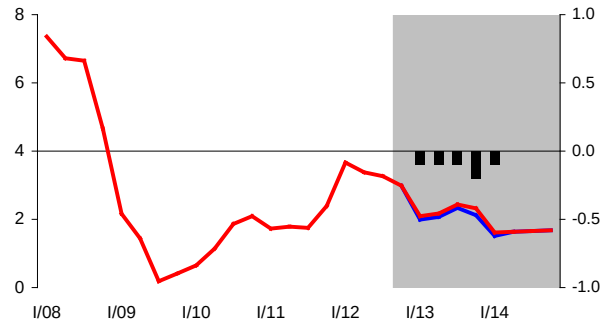
Exchange rate
(CZK/EUR; differences in CZK – right-hand scale)



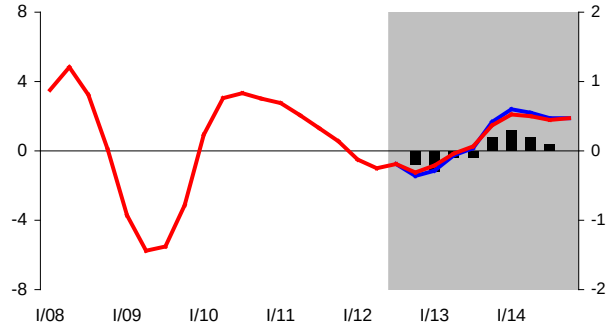
3M PRIBOR
(3M PRIBOR in %; differences in pp – right-hand scale)



CPI inflation
(annual percentage changes; differences in pp – right-hand scale)



GDP growth
(annual percentage changes; differences in pp – right-hand scale)



Source: CNB Inflation Report IV/2012

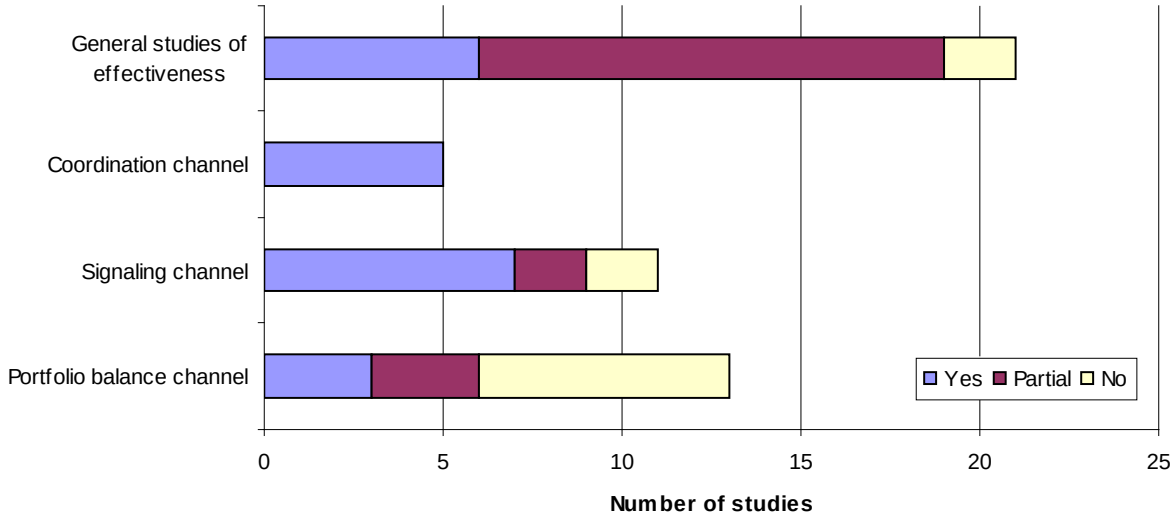
International experience with FX interventions

First, let us focus on the case of known interventions under the standard situation in actual practice. The number of official floaters is steadily increasing, but we still observe a "fear of floating" (Calvo and Reinhart, 2002), as many central banks in open economies do intervene regardless of their official position. According to the IMF's classification, independent floating dominates among IT countries (with 19 countries as of April 2008), but managed floating coexists with this regime (10 countries). Moreover, many independent floaters do actually intervene at least occasionally, with interventions having been more common during the recent crisis: Brazil in October 2008, Chile in January 2011, Indonesia in October/November 2008, Israel in 2008–09, Mexico in 2009, New Zealand in 2007, Poland in April 2010 and from September 2011 to December 2011, South Korea in 2008–09, and Switzerland since 2009.

Numerous proposals for managed floating regimes had already been put forward before the 2008 crisis (e.g., Bofinger and Wollmershäuser, 2003; Goldstein, 2002). The core of the idea is that if the central bank were able to reduce exchange rate volatility, it could achieve a better trade-off between inflation and output variability. However, two important questions remain unanswered: Can the theoretically meaningful outcome really be achieved in practice? And can it be

achieved without harming central bank credibility, the cornerstone of the inflation-targeting monetary policy regime? Cavusoglu (2010), reviewing studies that investigate the effectiveness of interventions, found that interventions have a significant short-lasting effect on exchange rates mainly through the signaling and coordination channels. But only a few studies have provided evidence that interventions have been effective in the longer term. Studies focusing on the general effectiveness of interventions, not on any particular pass-through channels, give a very mixed picture. The findings are summarized in Figure 4.

Do interventions work? Figure 4

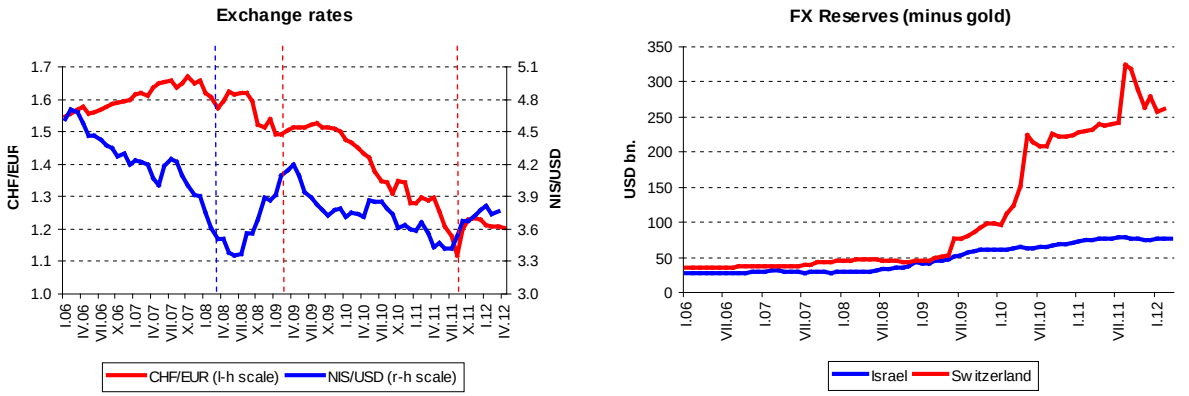


Source: Cavusoglu (2010)

When we limit ourselves to cases where interest rates are close to zero, only two countries have experience with interventions – Switzerland and Japan. Both are, however, very specific cases (safe haven and reserve currencies) where the central banks struggled to keep their currencies from further appreciation during periods of flight to safe assets. The Swiss National Bank (SNB) announced in March 2009 that it would ease monetary conditions in order to prevent any further appreciation of the CHF against the euro. Apart from directly purchasing foreign currency on the FX markets, the SNB started in August 2011 to perform indirect interventions by narrowing the key interest rate range from 0–0.75 pp to 0–0.25 pp, sharply raising the supply of liquidity, and by using FX swaps. On September 6, 2011, the SNB set a minimum exchange rate of 1.20 CHF/EUR, stating that it would buy foreign currency in unlimited quantities if the rate fell below this level. As a consequence, by September 2012 its balance sheet had tripled in size and the monetary base had grown by a factor of six over its 2008 level as a result of liquidity operations and FX interventions. The FX reserves rose by 450%, with 60% of them denominated in the euro. In July 2012 the reserves reached $417 bn, which is almost 70% of GDP, whereas the average for 1999–2007 was 13%. To sum up the Swiss experience, we can say that such a commitment is an effective tool if the bank is ready to purchase an unlimited quantity of assets (see Figure 5).

FX interventions by Switzerland and Israel

Figure 5



Source: IMF IFS

Probably the best example of a country comparable to the Czech Republic with recent experience of large-scale interventions is Israel. Israel, like the Czech Republic, is a small open economy, the Bank of Israel targets inflation, and the Israeli spot FX market is similar in size to the Czech one. However, the purpose of the interventions was different and hence has limited relevance from our perspective: Israel's interventions were motivated by exchange rate policy considerations rather than by FX being a monetary policy tool. The first round of interventions took place in March 2008 with the primary goal of increasing Israel's FX reserves. At the end of March, the BoI started buying about $25 million a day, and in July 2008 the average daily rate of purchases was increased to $100 million. In August 2009 the BoI abandoned regular unidirectional interventions and introduced the possibility of ad hoc bidirectional interventions, i.e., of buying and selling shekels at any time in the event of large movements in its exchange rate, not only in the case of market failure in the FX markets, but also in situations where the development of the exchange rate was inconsistent with economic conditions. Between March 2008 and July 2012 the reserves of the BoI increased from $29.4 bn to $75.4 bn. During the period of the interventions the FX reserves grew by 164% to more than 30% of GDP by the end of 2011. We can conclude that in Israel's case a large volume of purchases was needed, but their impact on the exchange rate was not very clear, as numerous currencies depreciated during the observed period. Also, the fact that the BoI never officially terminated the interventions points to possible exit strategy difficulties.

Czech experience

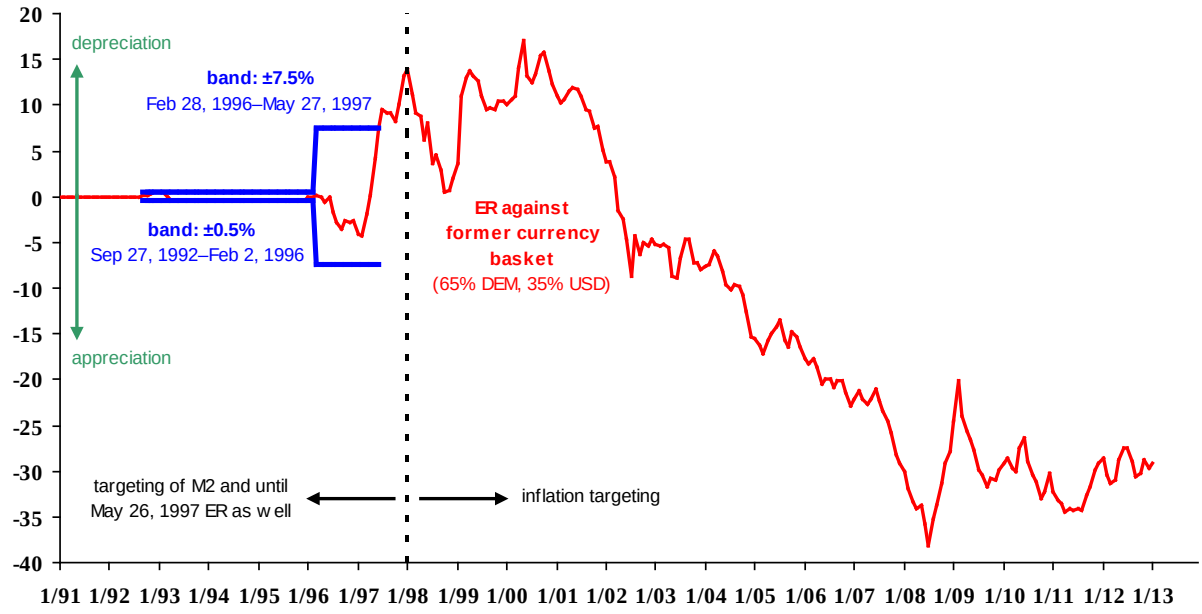
The Czech exchange rate regime shifted from a fixed to a floating one in 1997 (see Figure 6 for the evolution of exchange rate policy). Since then, the CNB has intervened in the FX market in three distinct periods, almost always against appreciation of the koruna. The first intervention period took place between February and July 1998, the second between October 1999 and March 2000, and the third between October 2001 and September 2002. But the evidence on the effectiveness of these interventions, summarized in Figures 7 and 8, is mixed. Sometimes there was a visible immediate impact lasting up to 3 months. In other

cases the effect was less clear, weak, or transient. Of course, without knowing the counterfactual this evidence cannot be used to convincingly address the impact of the interventions in question. However, there are several studies that address the effect of the CNB's FX operations on the FX market.

Disyatat and Galati (2007) found that the interventions of 2001–2002 had some statistically (weakly) significant impact on the spot rate and risk reversal, but that the impact was small. They did not find evidence that the interventions had had an influence on short-term exchange rate volatility. Geršl and Holub (2006) found that the interventions had probably played a minor role in influencing the exchange rate in the short run at best (see Figure 8). According to them, the interventions contributed to increasing the volatility of the exchange rate, but only to a limited extent. According to Geršl (2006), the interventions had only a small short-term effect on the exchange rate level, and to a certain extent contributed to increased conditional and implied volatility. And finally, Égert and Komárek (2006) concluded that from mid-1998 to 2002, koruna sales were effective in smoothing the path of the exchange rate for up to 60 days. This was not the case from 1997 to mid-1998.

Czech exchange rate policy

Figure 6

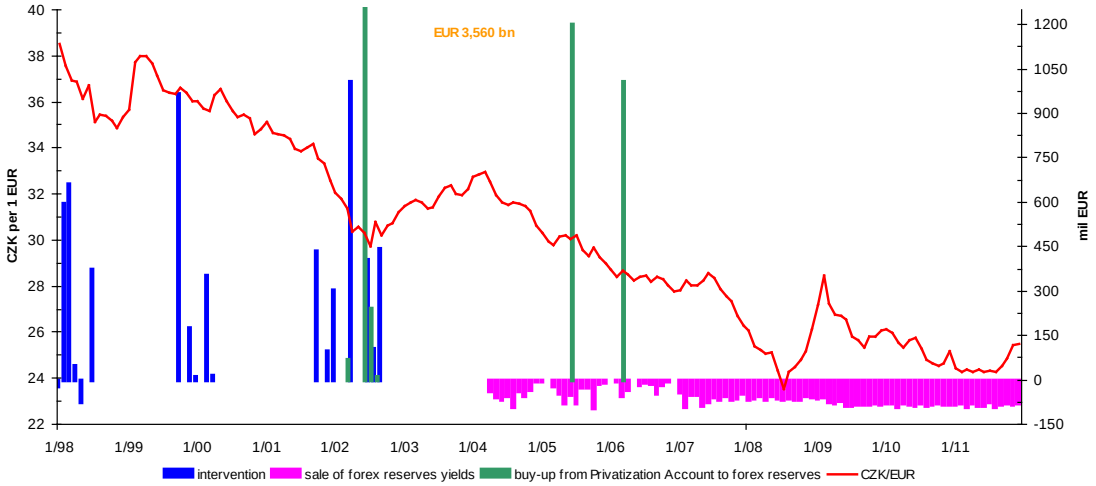


Source: CNB

In 2004 the CNB started selling a portion of its yields on FX reserves (these sales were recently discontinued). Starting in June 2007, the previously discretionary approach to reserve sales, with the timing and size of sales not pre-announced, was changed to a regime of daily sales. Domínguez, Fatum and Vacek (2010) analyze whether the euro-denominated reserve sales influenced the CZK/EUR rate, and reach an interesting and slightly counterintuitive conclusion: over the period of the discretionary regime, there is little evidence that the sales influenced the koruna. However, starting in 2007, when the CNB sold euros every business day, the decumulation of reserves led to statistically significant appreciation of the koruna against the euro. One possible explanation is that in the ad hoc regime the traders intentionally go against the market in order to minimize volatility, and the market trend predominates over the effects of the sales.

Interventions and other operations in the Czech FX market

Figure 7



Source: CNB

Effectiveness of Czech interventions

Figure 8

Starting month	Final month	Overall volume	**CZK/EUR** (ECU prior to 1999)						
(t)	(T)	EUR million	t-3M average	t-1M average	Start of t	Low of [t;T]	End of T	T+1M average	T+3M average
02/1998	**04/1998**	1285	37.87	38.50	38.37	36.30	36.46	36.11	35.11
06/1998	**07/1998**	508	36.95	36.11	36.49	34.35	34.35	35.47	35.17
10/1999	**10/1999**	966	36.52	36.36	35.72	35.68	36.62	36.40	36.03
12/1999	**12/1999**	229	36.36	36.40	36.08	35.83	36.13	36.03	35.60
03/2000	**03/2000**	394	36.05	35.71	35.65	35.53	35.63	36.31	36.02
10/2001	**01/2002**	643	33.86	34.19	33.91	31.46	31.92	31.79	30.36
04/2002	**04/2002**	1009	32.08	31.39	30.62	30.06	30.63	30.56	29.75
07/2002	**09/2002**	954	30.36	30.30	29.25	28.97	30.30	30.65	31.19

Note: red = unsuccessful (no trend reversal), blue = successful

Source: CNB

Exchange rate pass-through to consumer price inflation

The existing international and Czech empirical evidence suggests that FX interventions have the ability to influence the exchange rate, even though this may not always hold in the long term. Fatum and Pedersen (2009) made an interesting observation in this context when studying the effects of sterilized FX interventions by the Danish central bank. They found that interventions exert a significant influence on exchange rate returns only when the direction of intervention is consistent with the monetary policy stance. This is exactly the case when an FX shock is *not* accommodated, but rather *fueled*, by monetary policy inactivity. This also justifies the use of FX interventions as a tool of monetary policy when the interest rate has reached the zero limit and further easing is necessary to meet the

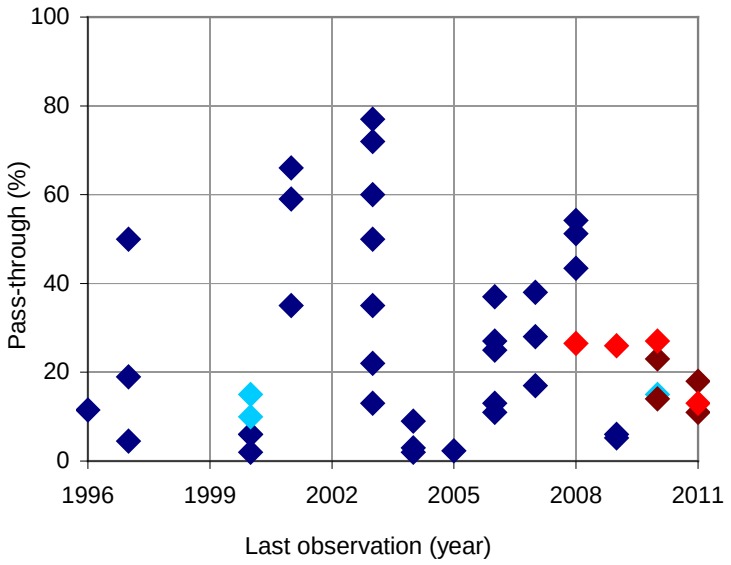
inflation target. When the interest rate can no longer be used or is insufficient to influence inflation expectations and achieve price stability, FX interventions become a viable option.

Knowing that FX interventions have the ability to influence the exchange rate, and that they are not in contradiction with IT under the zero-level limit, is only the first step toward their practical use as a tool for achieving the inflation target.

The next, practical, step is to quantitatively assess the exchange rate tool. The question we need to address first is how exchange rate changes affect prices in the Czech Republic. In other words, we need to address the relevance of existing simulations of exchange rate pass-through.

The results of existing empirical analyses of the transmission of an exchange rate shock to Czech inflation lie in a relatively wide band of 0% to almost 80% (see Figure 9) and are hard to compare due to substantial differences in the methods, empirical specifications, and time series spans used. Also, a slight decreasing tendency in exchange rate shock pass-through over the last decade is apparent. One of the most recent estimates – an impulse response based on a VAR model estimated on quarterly data for 1998-Q1 to 2012-Q3 (depicted in Figure 10) – suggests pass-through of nearly 8%. We do not have any evidence on whether the decreasing trend in the pass-through is due to the methodology used, to better monetary policy adjustment fully compensating the exchange rate shocks, or indeed to a change in the characteristics of the underlying transfer channels.

Exchange rate pass-through to Czech inflation based on a literature review — Figure 9

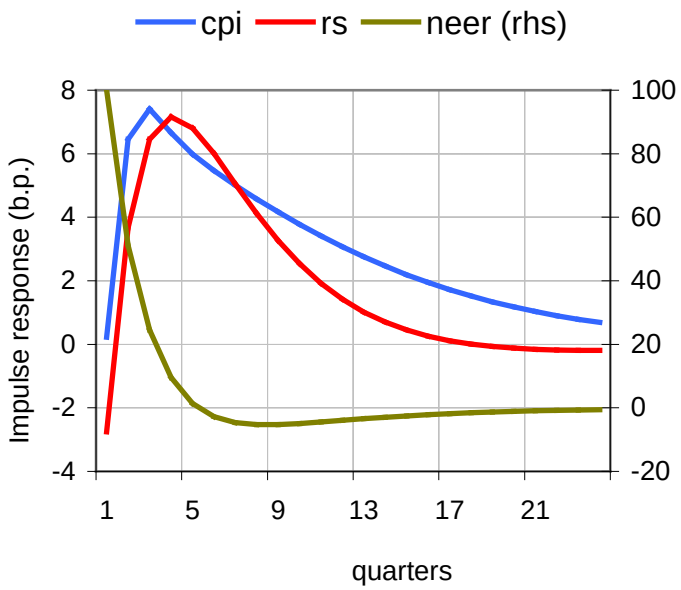


Note: The figure shows the reaction of consumer prices to an exchange rate shock of 1%. It summarizes 43 ERPT estimates for the Czech Republic collected from 22 papers and articles published in 2001–2012. Dark blue points represent time-invariant estimates. Light blue points are medians of time-varying estimates. Results based on the CNB RPN (forthcoming) are in dark red (VAR, VECM) or red (BVAR median and TVP-VAR for 2008-Q1, 2009-Q1 and 2010-Q1).

Source: Hájková and Saxa (forthcoming, 2013)

Impulse response of the CPI and the short-term interest rate to a Czech koruna depreciation of 1% (VAR model)

Figure 10

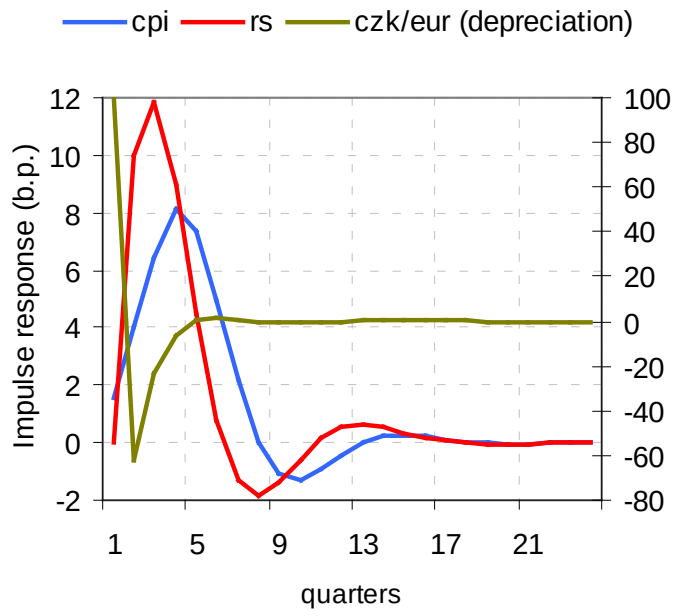


Note: The generalized impulse response is based on a VAR model estimated on quarterly data for 1998-Q1 to 2012-Q3. The vector of endogenous variables contains Czech GDP, the consumer price index (cpi), 3M PRIBOR (rs), the nominal effective exchange rate (neer), and monetary aggregate M2. The exogenous variables are the IFS All Primary Commodities price index, euro area GDP, and 3M EONIA.

Source: Earlier results from Hájková and Saxa (forthcoming, 2013)

Impulse response of the CPI and the short-term interest rate to a Czech koruna depreciation of 1% (g3 model)

Figure 11



Note: The impulse response is based on the CNB's core DSGE forecasting model, called g3. The notation represents consumer price index (cpi), 3M PRIBOR (rs), and nominal exchange rate (czk/eur).

Source: CNB

In the standard inflation-targeting regime, an exchange rate shock transmits through both a direct channel (import prices) and an indirect channel (economic activity), taking into account the endogenous reaction of all other variables, including interest rates. Through the direct channel of import prices the exchange rate change passes through to consumer prices almost immediately. However, exchange rate changes influence not only prices, but also, with some lag, real volumes of imports and exports, which consequently cause changes in the rate of growth of wages and employment. The labor market is thus the means of indirect pass-through of the exchange rate shock to consumer prices. This pass-through, however, is moderated by the reaction of interest rates. The movement of interest rates not only causes a correction in the nominal exchange rate, but also, by changing real interest rates, influences investment and private consumption.

Other estimates, based on BVAR and TVP-VAR models, which appear in a forthcoming CNB Research and Policy Note (Hájková and Saxa, forthcoming, 2013) lie in the interval of 13–26% (see the red points in Figure 9). The reaction of consumer prices to a shock is rather quick, peaking after about four quarters. Figure 11 depicts the impulse response based on the CNB's core DSGE forecasting model, which is very similar to the empirical evidence as regards both the strength and the timing of the pass-through. Analyses conducted in the CNB indicate that the strength of the response to an exchange rate shock gradually decreases along the distribution chain. The largest pass-through (over 50%) is observed for import prices; the transmission of the shock to industrial producer prices and to consumer inflation is an order of magnitude lower.

Influence of the zero lower bound on pass-through

When rates approach the zero lower bound (ZLB), the transmission of shocks to the economy may change, as we document using various instances of similar phenomena (one parameter fixed, decreased degrees of freedom). Take, for instance, Bayesian fan charts, which are used to predict the future development of an economy as it reacts to various exogenous shocks. Nowadays, central banks do not explicitly address the issue of the ZLB on the nominal interest rate when constructing fan charts. However, there are several possible approaches to forecasting at the ZLB.

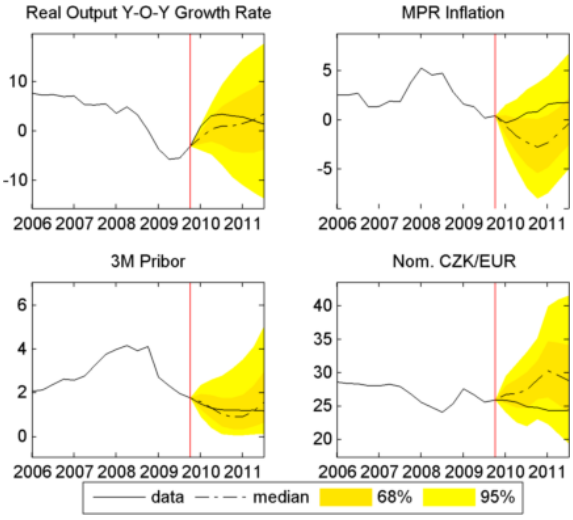
First, forecasts can be conditioned on shocks that lead to a non-negative nominal interest rate. Second, forecasts can be conditioned on the interest rate itself, regardless of the shocks hitting the economy. And finally, the ZLB can be ignored completely.

Franta et al. (2013), based on Czech data, show that, depending on which types of shock we exclude from the construction of the simulated density forecasts, we can introduce different types of bias. In the first approach, all shocks which directly or indirectly imply a decreasing interest rate are filtered out. For example, a negative demand shock, which usually leads to fall in output, in inflation, and in the interest rate, is also discarded by this approach when the economy reaches the ZLB. As a consequence, negative demand shocks are less likely to be included in the simulated density forecast than are positive demand shocks.

The second approach imposes zero on all negative parts of the interest rate path, but constructs the density forecast using all draws of shocks. For example, a

negative monetary policy shock, which is not possible at the ZLB, gets into the sample of forecasts from which the density is sampled. Even though such a shock has no impact on the nominal interest rate, it immediately affects the exchange rate, and thus other variables in the following periods.

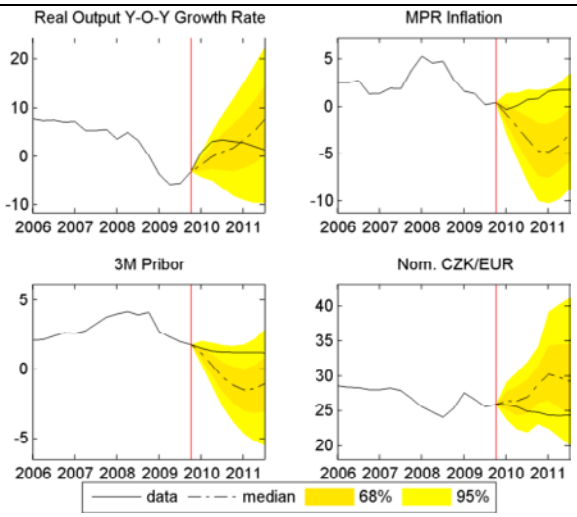
Shocks filtered (ZLB active) Figure 12



Note: Fan charts starting in 2010-Q1. The vertical line denotes the period of the last observed values used for the estimation. The density forecasts are characterized by the centered 95% (light yellow), centered 68% (dark yellow), and median of the marginalized joint distribution.

Source: Franta et al. (2013)

ZLB ignored Figure 13



Note: Fan charts starting in 2010-Q1. The vertical line denotes the period of the last observed values used for the estimation. The density forecasts are characterized by the centered 95% (light yellow), centered 68% (dark yellow), and median of the marginalized joint distribution.

Source: Franta et al. (2013)

In the last case, not only all draws of shocks, but also possible negative lagged values of the nominal interest rate are used to construct the density forecast. We do not intend to discuss the question of the accuracy or usefulness of the individual

approaches, but they do allow us to demonstrate the difference in forecasts, i.e., the theoretical responses of the economy to shocks when the zero interest rate limit is binding. As Figures 12 and 13 demonstrate, the differences in the forecasts can be sizable (note the differences in the vertical scales). Not accounting for the ZLB at all (Figure 13) leads to ex-post observed monetary-policy-relevant inflation being on the edge of the centered 95% of the distribution forecast. A similar result is observed if a zero nominal interest rate is imposed following the second approach mentioned above. Ignoring the ZLB also leads to an over-optimistic outlook for real output growth. These results highlight one important finding: the models we use in normal times will not necessarily work correctly as the economy approaches and hits the zero lower bound on nominal interest rates.

As shown by many authors (e.g., Portes, 1969), fixing one input or binding constraint in effect leads in general to higher responsiveness (or volatility) of the remaining variables, *ceteris paribus*. This is also true for the exchange rate pass-through with the ZLB binding. When monetary policy acts to stabilize the economy and reacts transparently to an exchange rate shock, the exchange rate pass-through to inflation is relatively small, as the above-mentioned empirical evidence suggests. But the transmission of an exchange rate shock changes as the central bank approaches the ZLB and interest rates cannot counteract the shock. Depending on how long economic agents expect monetary policy to operate in the ZLB regime, the pass-through of the exchange rate to inflation increases sizably. The first channel is import prices, which directly cause higher inflation without a stabilizing reaction of interest rates. The second channel is real interest rates: longer-term fixed nominal interest rates due to the ZLB and gradually increasing inflation push down real interest rates and thereby stimulate real economic activity, for instance private consumption. The two channels therefore work in the same direction.

It is not only monetary policy that is sensitive to the existence of the ZLB. Analogously, in a meta-analysis of fiscal multipliers, Gerchert and Will (2012) show that the fiscal multipliers are significantly higher in a ZLB regime regardless of the subsample of models chosen. We can therefore conclude that the existing studies estimating the size of pass-through are not all applicable in a situation of zero rates, and that the pass-through at the ZLB can be several times larger than past estimates.

Costs of FX interventions

A major impediment to conducting FX interventions might be their adverse effect on central banks' balance sheets. However, one has to keep in mind that when intervening with the goal of easing monetary conditions, no costly sterilization is necessary, because in such a situation the monetary consequences of intervention are in line with the monetary policy objective. But that does not mean that FX interventions are without cost. Long-lasting interventions against one's own currency usually lead to a sizable buildup of international reserves. With the local currency appreciating due to the economic convergence of the country, assets denominated in foreign currencies have to be revalued. And if the central bank holds more foreign currency assets than foreign currency liabilities, such revaluation creates financial losses.

As, for example, Stella (2008) and Stella and Lönnberg (2008) point out, the accumulation of losses may have a negative impact on the financial strength of the

central bank and undermine the credibility of monetary policy. However, in order to correctly understand the degree of credibility risk, the central bank's balance sheet situation has to be put in the relevant macroeconomic context that the bank faces. Cincibuch et al. (2009) develop a formal framework for assessing the sustainability of the central bank's balance sheet. Taking the long-run trends from the CNB's forecasts and simulating the long-term development of the CNB's balance sheet, they show that the CNB should eventually get into a profit-making situation as economic convergence progresses, and the risk premium, as well as the real exchange rate appreciation trend, is likely to disappear. They conclude that the CNB will be able to repay its current accumulated loss out of future profits.

The long-term sustainability of the balance sheet and the central bank's credibility, therefore, will not necessarily be compromised even in situations of negative own capital if the losses stem from the country's economic convergence. On the other hand, theoretical expectations are one thing, but the actual ability to pursue monetary policy objectives, such as stabilizing inflation expectations, may be jeopardized when the central bank becomes financially weak. To analyze the issue, Benecká et al. (2012) empirically address the link between central bank financial strength and inflation. On a panel of more than 100 countries between 2002 and 2009, they find in a few cases that there is indeed a statistically significant negative relationship between financial strength and inflation. But the results lack robustness with respect to the choice of alternative measures of financial strength and econometric technique. Also, there is some evidence that the relationship is non-linear, with only substantial financial weakness being associated with higher inflation, and moreover the link exists only for countries with the lowest level of central bank legal independence and/or relatively high inflation rates.

In general, according to Benecká et al. (2012), the explanatory power of central banks' financial strength indicators is rather weak, while other inflation determinants seem to play a more important and robust role.

Concluding remarks

The use of foreign exchange interventions to ease monetary conditions in an open economy is a rational choice. First, this monetary instrument is used only when interest rates are at a zero level, i.e., when the standard natural tool is no longer available. Second, the power of the central bank when intervening against its own currency is not limited by the volume of reserves. Third, the depreciation helps net exports, which is a good side-effect stimulating the economy. And finally, the pass-through at the zero lower bound is significantly higher than that assumed on the basis of past experience during normal times. In essence, in an economy with abundant liquidity in the banking sector, such as the Czech Republic, FX interventions are the most efficient way to implement quantitative easing.

Finally, we would argue that in such a situation, FX interventions do not reduce the transparency and credibility of inflation targeting. The inflation target – including the tolerance band around it – remains unchanged and is publicly known in advance. On the contrary, if further easing is necessary, the zero interest rate bound prompts questions of credibility due to the primary tool having been exhausted. The prediction of the market interest rate path, despite the fact that it reflects the zero level, remains publicly announced. However, the exchange rate itself is still not the target, but rather a new tool for achieving the target.

Consequently, it is not meaningful to specify a "target exchange rate." The desired policy exchange rate changes dynamically over time and is determined by the evolution of the forecasted economic conditions and the targeted inflation rate.

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