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International Reserves, Exchange Rate Differences and the CNB's Financial Result

Igor Ljubaj

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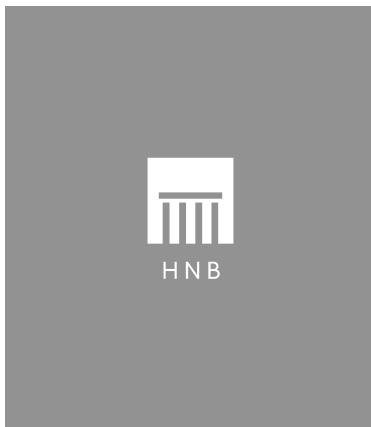
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**International Reserves, Exchange Rate
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Igor Ljubaj

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Abstract

International reserves are liquid foreign assets readily available to the central bank for mitigating the effects of possible balance of payments imbalances. When monetary policy is based on maintaining the stability of the domestic currency, as it is the case of the Croatian National Bank (CNB), the role of international reserves is even larger; international reserves as foreign exchange assets usually account for most of the central bank's assets, while liabilities are denominated in the domestic currency, so that a currency mismatch between the assets and the liabilities tends to arise. Any change in the exchange rate of the domestic currency against world reserve currencies will lead to the calculation of unrealised exchange rate differences. This also was why in 2017 and 2018 the CNB recorded the first negative result since 2003. In 2017, it was mostly due to the strengthening of the euro against the dollar in the global foreign exchange market, while in 2018, it was due to the strengthening of the kuna against the euro. As a result of both circumstances, international reserves in kuna terms were reduced, while, excluding the exchange rate differences, the CNB's revenues exceeded expenditures, as they had in all the previous years. The large amount of exchange rate differences was also a consequence of the considerable increase of international reserves in the recent period, exchange rate differences thus being much larger for the same change in the exchange rate. Some central banks, indeed, lost their entire capital because of the large foreign exchange losses. The CNB's capital was never in jeopardy, because losses were easily covered from general reserves created in the previous years. For the CNB, accession to the euro area will require the application of ECB accounting guidelines, which are more appropriate for the central bank's operation. Then, because of a different accounting treatment, exchange rate differences will no longer impact the financial result in the same way as it does today. This will increase the stability and predictability of the financial result, as well as the probability of the allocation of profits to the state budget.

Keywords:

international reserves, CNB, financial result, exchange rate differences, financial independence

JEL:

E58, E59, N20

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1 Introduction

The primary purpose of central banks is to meet their legally defined goals, in particular to maintain price stability, and not to pursue profits. Therefore, their financial results are often a poor guide to the evaluation of their efficacy (Archer and Moser-Bohem, 2013). However, although the financial result of a central bank's operations is not intended to be a monetary policy objective, the fact is that a positive result strengthens the central bank's financial independence. Profitable central bank operations protect its initial capital and enable the allocation of a portion or the entirety of the profit into the state budget. By contrast, negative financial results, if they are considerable or frequent, may have unfavourable consequences for the central bank's institutional credibility and public trust, as well as the market participants' lack of confidence can give rise to political pressures. For this reason, it is very important to understand the key reasons for a potential negative result and provide a clear explanation. This is the only way in which the transparency of the central bank's operations can be ensured and its financial independence eventually preserved, which is one of the key preconditions for a successful implementation of monetary policy.

The situation in which a negative financial result is triggered by unrealised exchange differences as an accounting measure is a special case. Central banks, as opposed to commercial banks, often have structural currency mismatches in their balance sheets, so that a substantial portion of their assets is usually in foreign currency (i.e. international reserves), while liabilities are denominated in the domestic currency. As a result, considerable exchange differences may be recorded in the profit or loss account¹. Currency mismatches are particularly pronounced in small open economies that have larger needs for international reserves, and may also be linked to the

monetary policy framework, particularly one based on maintaining the stability of the exchange rate of the domestic currency. All of the above applies to the Croatian National Bank, which in 2017 and 2018 recorded losses after a number of years of positive financial results. However, these losses were exclusively the consequence of unrealised exchange differences, and not of a deficit in operating income over expenditures or the materialisation of any other risk, such as credit or interest rate risks. This paper aims to clarify the impact of exchange rate differences on the CNB's financial result by providing a theoretical background for their existence in the context of international reserves management, and to discuss them in comparable cases of other central banks.

The role of international reserves is elaborated at the start of the paper. Then, in the third chapter, the role, the size and the structure of CNB's international reserves are described together with the source of exchange rate differences, as well as the manner in which they impact the results of the CNB's Income Statement. This part includes discussion of options for hedging against currency risk. The fourth chapter shows the CNB's financial results, with a closer look at 2017 and 2018 performance. The fifth chapter provides examples of other central banks that recorded large losses due to foreign exchange losses. In this context, the issue of negative capital is also elaborated as well as the possibility of applying different accounting rules that have effect on the final financial result, with emphasis on the rules applicable in the euro area. The final chapter provides a view on the future adoption of the euro in Croatia and of ECB accounting rules as a possible solution to the problem of the impact of exchange differences on the accounting presentation of the CNB's financial result.

2 Role of international reserves

International reserves have historically and fundamentally played an important role in fulfilling the tasks of almost every central bank and are an important tool in ensuring a country's macroeconomic stability. In practice, international reserves are held in line with a range of objectives (IMF, 2009, 2014), including to: support and maintain confidence in the monetary and exchange rate policy including the capacity to intervene in support of the domestic currency exchange rate; absorb shocks during times of crisis by maintaining foreign currency liquidity, which in particular refers to balance-of-payment crises and to provide markets with a level of confidence that a country can meet its current and future external liabilities. In addition, reserves are some sort of coverage of the domestic currency, and can also serve as special hedging in the case of unpredictable circumstances. International reserves, by definition, are all liquid foreign assets readily available to the central bank, which

can be used to mitigate the effects of external risks, and include gold and Special Drawing Rights (SDRs) of the International Monetary Fund.

International reserves are held irrespective of the type of the monetary or exchange rate regime adopted and can contribute to an increase in the level of monetary policy independence. As stated by Allegret and Allegret (2018), the considerable accumulation of international reserves facilitates a trade-off between the independent pursuance of monetary policy (in terms of the possibility of the interest rate channel being employed), the financial openness of a country and the stability of the domestic currency, which is labelled as an impossible trilemma or trinity. In this sense, if the selection of the framework for pursuing monetary policy of a central bank is based on maintaining exchange rate stability, the role of reserves is even larger.

The main principles for managing international reserves are

¹ An interesting presentation of the value of assets being more sensitive than changes in central bank's liabilities to exchange rate developments can be found in DNB (2018).

usually the criteria of security and liquidity because profitability is not, nor should it be, an objective of the central bank's operations. However, international reserves may be a significant source of central bank's revenues supporting its financial independence, while the net profit generated is usually allocated to the state budget.

On the other hand, the holding of international reserves from a country's perspective comprises the opportunity cost that comes from substituting lower yielding foreign for high yielding domestic assets. Also, the opportunity cost is incurred when the central bank wishes to maintain the exchange rate stability of the domestic currency and for this reason, in the case of large foreign currency inflows in the country, purchases foreign currency and creates a large amount of domestic liquidity (reserve money). If it is forced to sterilise such liquidity

because of the inflationary pressures, for instance by issuing T-bills or taking deposits from banks at interest rates higher than the interest rate it can achieve by investing reserves in the international market, the consequence will be a negative net interest income from such transactions. The concept of opportunity cost can also be viewed through the prism of the spread between the cost of foreign borrowing for the country and the rate of return on the liquid foreign assets of international reserves. Rodrik (2006) calls this spread the social cost of holding reserves as self-insurance. The issue of opportunity cost is also closely related to the size of the reserves themselves, so that the larger the reserves, the larger the opportunity cost. For this reason, it is useful to have at one's disposal an assessment of adequate or optimal levels of reserves.

3 International reserves of the CNB, currency exposure and exchange rate differences

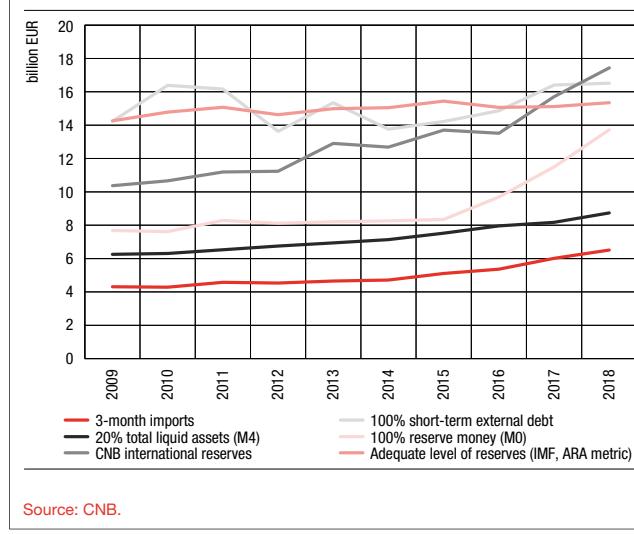
For the CNB, international reserves represent the main buffer ensuring the relative stability of the exchange rate of the domestic currency against the euro, so that the role of international reserves is particularly important. Due to the high euroisation² of the Croatian economy and financial system, the CNB has to prevent excessive exchange rate volatility through occasional foreign exchange interventions and thus ensure the fulfilment of the CNB's primary objective – the maintenance of price stability. Also, as the CNB primarily ensures the stability of the exchange rate of the kuna against the euro, at the same time, the volatility of the exchange rate of the kuna against all other world currencies is assumed, i.e. these exchange rates

to the largest extent reflect the changes in the value of the euro against other currencies in the global foreign exchange markets.

In an earlier paper, Čeh and Krznar (2009) showed that the CNB held sufficient reserves as an instrument of self-insurance and crisis prevention only in a scenario in which parent banks assumed the role of lenders of last resort. During that period, the IMF's macroeconomic-based reserve adequacy assessments³ were below the desired levels. However, following a noticeable accumulation of reserves in the past years, in particular in 2017 and 2018, the CNB's reserve adequacy increased and became satisfactory even according to the IMF's metric and relative to the level of short-term external debt, while relative to other common indicators (monetary aggregates and three-month imports value) it was constantly adequate (Figure 1).

Along with the large increase in international reserves, the possibility that unrealised⁴ exchange rate differences (change in the value of reserves shown in the domestic currency due to changes in the exchange rate) will have a considerable impact on the financial result of the central bank also increases. The ECB (2006) has also warned about this problem in a paper on the accumulation of international reserves, where it is emphasised as one of the potential risks and costs that may eventually have a negative impact on the central bank's capital. The financial result of a central bank is determined by the size and the structure of assets and liabilities, and unrealised exchange differences arise because of the mismatch in the balance sheet currency structure. In the case of the CNB, almost the entire assets (at the end of 2018, over 98%) relate to international reserves that are foreign exchange assets, while the largest share of liabilities, which predominantly comprise the base or reserve money, are kuna-denominated. The consequence of such a

Figure 1 Accumulation of CNB's international reserves and the improvement of their adequacy



2 For more on the issue of euroisation in Croatia, see Dumičić, Ljubaj and Martinis (2017).

3 For more on the IMF's assessment based on the ARA metric see https://www.imf.org/external/datamapper/Reserves_ARA@ARA.

4 It is an accrual category, a change behind which no transactions have been carried out.

mismatch between currency assets and liabilities is a considerable exposure to currency risk, i.e. to the fluctuation of foreign currency exchange rates in which international reserves investments are denominated relative to the reporting currency – the kuna (for more on the currency mismatch in the balance sheets of other central banks, see Chapter 5.1). For this reason, exchange rate differences may determine the final result of the Income Statement in a calendar year.

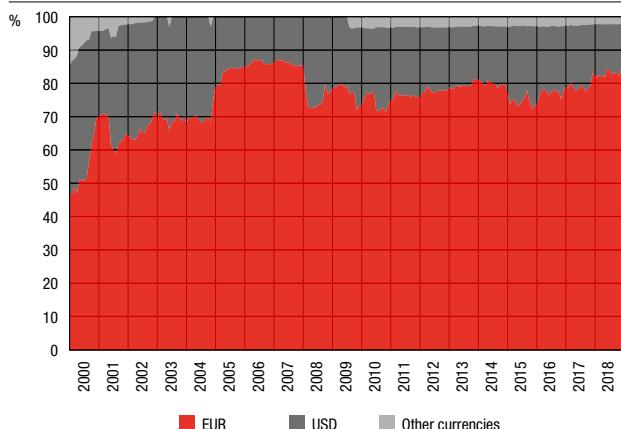
The result of the Income Statement also depends on the accounting standards applied by the individual central bank. The CNB prepares its financial statements according to International Financial Reporting Standards (IFRS), in accordance with which exchange rate differences are initially recognised in the Income Statement, after which the distribution of profits is carried out, or loss is covered from the CNB's general reserves (for more on the accounting aspect of exchange rate differences, see Chapter 5.3, in particular in the context of the ECB's accounting guidelines in which exchange differences are not initially recognised in the Income Statement).

The currency mismatch in the CNB's balance sheet also results from the fact that foreign exchange interventions are the basic channel for reserve money creation, so that when the CNB purchases foreign currency through a foreign exchange intervention in the domestic market, international reserves increase and reserve money is created. Large capital inflows in the pre-crisis period, like the surplus in the current and capital account of the balance of payments in the past few years, gave rise to appreciation pressures. Therefore, the CNB most frequently purchases foreign currency through foreign exchange interventions and thus prevents the excessive strengthening of the domestic currency. This is why in Croatia the entire reserve money and money (M1) are covered by international reserves, while open market operations in the domestic currency have lesser importance, domestic assets thus being relatively small.

The CNB, like all other central banks, ensures a relatively stable currency structure for the international reserves. Large and frequent changes in the currency structure might jeopardise monetary policy objectives and the stability of the exchange rate of the domestic currency. They could also be considered as speculative behaviour, which would not be in line with the central bank's task to take account of currency risk of the country and the economy. For this reason, the decision on the currency structure is determined in accordance both with the risks that international reserves hedge and with monetary policy objectives, and is profit motivated only to a smaller extent. Also, the final result of the profit and loss account and exchange rate differences are not the objective of the central bank, which is always and primarily the maintenance of the stability of prices and financial stability.

The general basis for determining the share of currencies in the CNB's international reserves is the currency structure of the short-term external debt of the Republic of Croatia, and the currency structure of the imports of goods and services generated in the past year. Thus the ability of the Republic of Croatia to meet its external liabilities from exchange rate changes of the major world currencies is protected, i.e.

Figure 2 Currency structure of CNB's international reserves from 2000 to 2018



Source: CNB.

the purchase power of the reserves is maintained. International reserves are mostly invested in the euro (which is also logical because the exchange rate policy is aimed at the stability of the exchange rate of the kuna against the euro and because of the high euroisation of the Croatian financial system), while a smaller share of reserves, based on the described parameters, is invested in the US dollar. At the end of 2018, the euro accounted for 85.1% and the US dollar for 12.7%⁵ of the total international reserves.

In a longer period of observation, the share of the US dollar in the beginning of the past decade reached a level of up to 40% (Figure 2). By a gradual reduction in the share of the US dollar, in accordance with the assessment on the economy's lesser need for a buffer in the form of dollar liquidity, the volatility of unrealised exchange rate differences was reduced, which resulted from the change in international reserves expressed in kuna, due to the change in the exchange rate of the euro against the dollar. This has also reduced the risk from larger loss generation on this basis.

Since the CNB maintains the kuna/euro exchange rate stable, it cannot at the same time also impact the movement in the exchange rate of the US dollar against the kuna, which depends on the exchange rate of the US dollar against the euro determined in the global foreign exchange market. The relative annual change in the exchange rate of the kuna against the US dollar is therefore most frequently larger than the change in the exchange rate of the kuna against the euro. This is confirmed by the average annual volatility of the exchange rate of the dollar against the euro being about five times larger than the average volatility of the exchange rate of the kuna against the euro. Therefore, it can significantly impact the exchange rate differences arising from reserve investments (as was the case in 2017).⁶ Finally, it is worth noting that the movement of the exchange rate of the dollar against the euro is very uncertain and almost unpredictable, and that it depends on many

⁵ Special drawing rights (SDRs) accounted for the remaining 2.1% of the reserves.

⁶ Although the share of the US dollar in international reserves is smaller than the share of the euro, because of its larger volatility, a significant portion of the existing general reserves of the CNB, which, among other things, serve for the coverage of foreign exchange losses, has been created from the accrued unrealised exchange rate gains based on the movements of the exchange rate of the kuna against the US dollar in the previous periods.

global macroeconomic, financial, monetary, (geo)political and other factors. In line with the described currency structure of international reserves, this currency risk is actually fully taken for the purpose of preserving the purchasing power of the international reserves.

The possibility of hedging against currency risk is sometimes mentioned in discussions as one of the possible solutions of the problem of the ordinary open currency position in the central bank's balance sheet. However, no attention is usually paid to hedging against currency risk actually reducing the availability of the reserves and militating against the purpose for which they are held, as explained above. Some of the consequences of such actions, including the accompanying costs, are often not considered. First, it is worth differentiating the hedging of the foreign exchange position by the position in the domestic currency, which actually eliminates currency risk, from the hedging of one foreign exchange position by another foreign exchange position (for instance, the dollar position by the euro position), when currency risk remains present and exchange rate differences are still recorded in the domestic currency.

Typically, a full closure of an open foreign exchange position in the domestic currency in the case of a central bank does not seem to be justified in monetary terms, nor is it possible in the market. Even if foreign exchange assets were substituted for domestic assets (currency), such a transaction would certainly jeopardise monetary policy objectives because it would involve considerable amounts. Also, hedging operations against currency risk by the domestic currency would actually consist of foreign exchange interventions in the spot market with implications on the domestic currency exchange rate. For example, if the CNB were to shorten its long foreign exchange position by swapping foreign exchange assets for kuna assets, it would mean that commercial banks in such a transaction, on the other hand, would have to offer huge kuna funds. This would only create additional appreciation pressures and destabilise the exchange rate, which would require new foreign exchange interventions and the growth of international reserves. Therefore, market opportunities of hedging against currency risk for large amounts such as total international reserves in a small country with a currency without the status of a reserve world currency, are practically impossible (there is no possibility to hedge, e.g., 15 billion of euro assets with kuna assets). Hedging against currency risk in the case of the euro

area member states to a large extent is viable in the market and banks use it (e.g. The Netherlands or Lithuania) because they hold most of their assets in euros anyway, i.e. they can hedge only a smaller portion of the assets (e.g. dollars or a third currency) by the euro as their domestic currency.⁷

The described hedging against currency risk by the domestic currency is not the same as covering one foreign exchange exposure by another. For instance, when hedging assets in the US dollar with euro assets, also a foreign currency in the CNB's case, currency risk is not completely eliminated. Although such a policy may prove to be justified in terms of support to the central bank's financial result (if the movement of the exchange rate of the euro and the dollar in a specific period is correctly assessed), it carries a certain, often considerable, financial cost. And in the long run, it does not necessarily guarantee the achievement of a positive Income Statement because it still actually does not hedge against exchange rate changes in foreign exchange assets relative to the domestic currency. Also, such hedging against currency risk implies a change in the currency structure of international reserves, which may be contrary to the desired currency structure, which is primarily determined according to external risks for the country. Maintaining the currency structure of the central bank's balance sheet relatively stable is precisely the way to optimise and hedge a country's currency risk. Therefore, with hedging against currency risk, both foreign exchange and interest rate diversification are lost. Also, in the case of CNB, it should be taken into account that net exchange rate gains were accumulated in the period from 2003 to 2018, and contributed to the creation of general reserves in CNB's capital accounts.

Finally, there is the example of the Swiss central bank, which in accordance with the monetary policy objectives manages large international reserves, meaning it is at the same time exposed to considerable currency risk. In its Annual Reports (SNB, 2015 and 2016), the Swiss central bank regularly elaborates that there is no sense in hedging the large exposure to currency risk in the market because it would have an undesirable effect on monetary policy. Such operations, for example, selling foreign exchange forwards against Swiss francs, would lead to creating demand for Swiss francs in the market and would only create additional appreciation pressures on the domestic currency. For this reason, currency risk is considered an inherent component of foreign currency reserve management.

4 Impact of exchange rate differences on the CNB's financial result

Until the loss recorded in 2017, and then again in 2018, the CNB had consistently reported positive financial results (financial results, the main components of the Income Statement and the allocation of profits to the state budget from 2003 to 2018 are shown in Table 1 and Figure 1). In these sixteen years, the CNB cumulatively generated profits in the amount of HRK 13 billion (including exchange rate differences), of which HRK

8.3 billion was allocated to general reserves, while HRK 4.8 billion was allocated to the state budget. In the past twenty-seven years, profits were allocated to the state budget of the Republic of Croatia in twenty-one years, in the total amount of HRK 7.3 billion.

The losses recorded in 2017 and 2018 were exclusively the consequence of accrued unrealised exchange rate losses, which

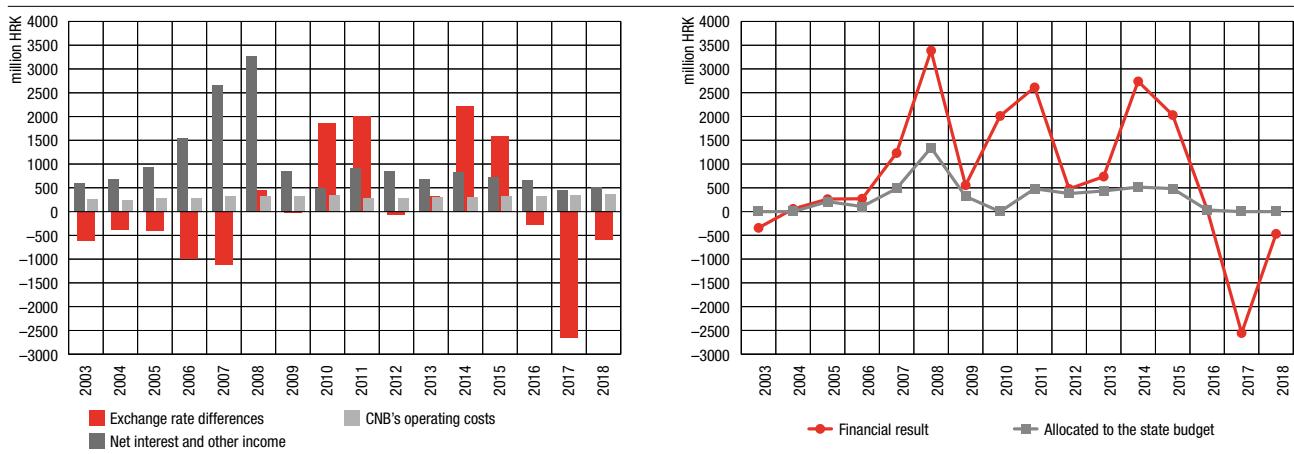
⁷ There are also examples of hedging against currency risk of non-euro area countries, e.g. Denmark, however, it is worth noting that the exchange rate of the Danish krone against the euro is extremely stable, while the cost of these operations is not negligible and it significantly determines the overall result, which is evident from the annual reports of the Danish central bank.

Table 1 CNB's Income Statement from 2003 to 2018 – components, result, general reserves formation and profit allocation to the state budget
in HRK million

	Total revenue	Total expenditures	Decrease(+)/ increase(-) in provisions	Exchange rate differences	Financial result	Net profit transferred to general reserves (+)/ loss covered from general reserves (-)	General reserves	Allocated to the state budget
2003	594.5	250.6	-76.6	-609.7	-342.5	-342.5	2,149.4	0.0
2004	689.9	246.6	-1.0	-385.7	56.5	56.5	2,211.5	0.0
2005	934.7	279.6	7.3	-400.8	261.7	52.3	2,268.9	209.4
2006	1,540.5	284.7	6.9	-992.5	270.2	165.4	2,439.4	104.8
2007	2,669.0	319.3	-0.4	-1,116.6	1,232.6	747.9	3,199.3	484.7
2008	3,265.3	330.6	1.1	451.2	3,387.0	2,044.5	5,250.1	1,342.5
2009	857.6	330.4	41.6	-15.5	553.2	234.9	5,491.2	318.4
2010	492.8	341.4	-1.4	1,861.6	2,011.6	2,011.6	7,507.8	0.0
2011	905.1	290.5	-1.4	2,000.6	2,613.9	2,133.8	9,648.6	480.1
2012	841.6	292.7	0.9	-73.9	475.8	95.2	9,748.9	380.7
2013	688.5	296.1	15.7	327.5	735.6	303.6	10,058.6	432.0
2014	829.7	308.9	0.8	2,218.6	2,740.2	2,223.9	12,281.6	516.3
2015	716.1	318.8	46.3	1,588.2	2,031.8	1,548.8	13,835.6	483.0
2016	670.3	326.6	-22.8	-278.8	42.1	8.4	13,849.3	33.7
2017	453.5	346.5	-2.5	-2,658.7	-2,554.2	-2,554.2	11,300.3	0.0
2018	512.1	374.0	-3.5	-602.9	-468.4	-468.4	10,820.9	0.0
Total 2013 – 2018	16,661.1	4,937.2	10.9	1,312.4	13,047.2	8,261.7	–	4,785.5

Source: CNB Annual Reports.

Figure 3 CNB Income Statement from 2003 to 2018
key components, result and allocation to the state budget



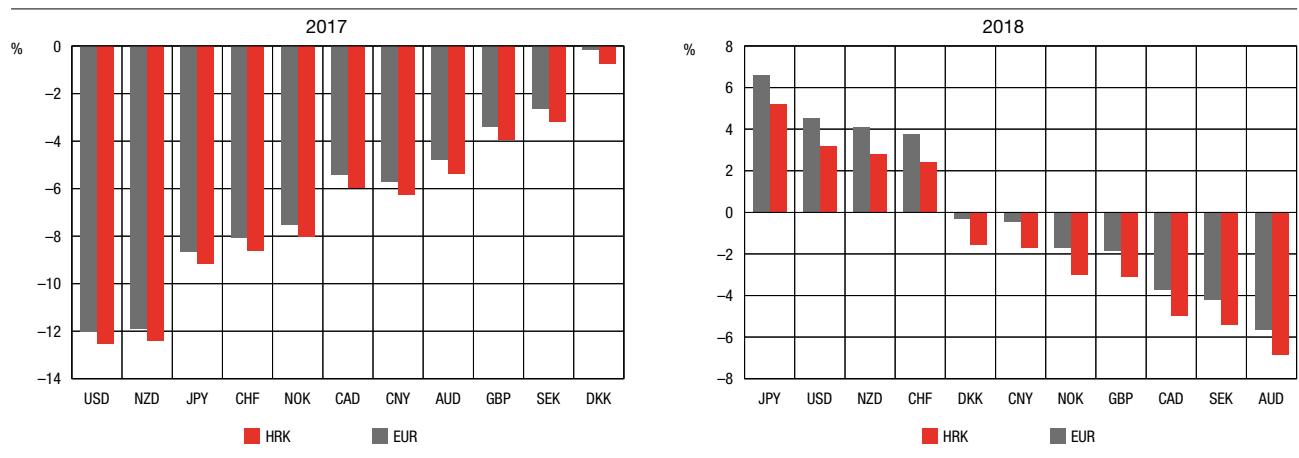
Note: The majority of net interest and other income refers to international reserves investment.

Source: CNB Annual Reports.

reduced the amount of international reserves when expressed in kuna terms. In 2017, it was due to a noticeable strengthening of the kuna against the US dollar (by more than 12%), which was actually the consequence of the strengthening of the euro against the dollar in the global foreign exchange markets. In 2018, the negative impact arose from the strengthening of the kuna against the euro. If exchange rate differences are

excluded, the CNB has continuously recorded a surplus of income over expenditures. Thus, according to the ratio between net interest and similar income, which mostly includes revenues from international reserves investments, and total costs, as in all previous years, in 2017 and 2018, the CNB actually achieved a positive financial result, in conditions when interest rates in global financial markets were at historic lows, and

Figure 4 Changes in the exchange rates of the euro and the kuna against major world currencies in 2017 and 2018



Note: The negative percentage change implies the strengthening of the euro or the kuna against the respective currency.

Sources: Bloomberg and the CNB exchange rate list.

a large share of euro government bonds had negative yields. CNB total revenues were higher than total costs by HRK 107 million and HRK 138 million in 2017 and 2018 respectively. However, these amounts were exceeded significantly by unrealised exchange rate losses (HRK –2,659 million in 2017 and HRK –603 million in 2018), so that the final financial result stood at HRK –2,554 million in 2017 and HRK –468 million in 2018.

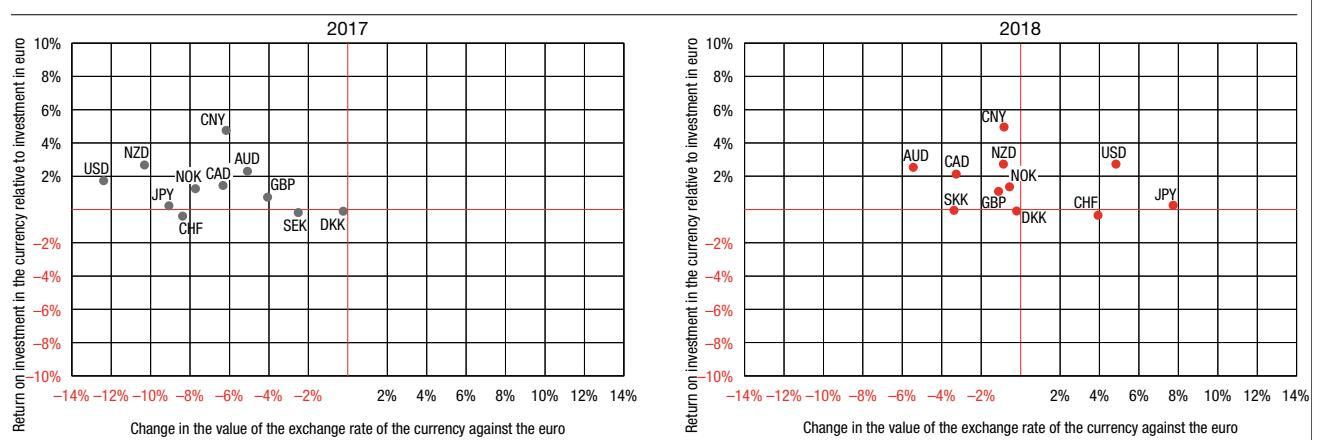
Losses were “covered” from the CNB’s general reserves formed in the years when the foreign exchange gains were recorded. This is because in accordance with legal provisions unrealised foreign exchange gains generated by adjusting the value of balance sheet positions with exchange rate and price changes are transferred to general reserves in the CNB’s capital accounts. Thus, general reserves serve as a provision or buffer for future foreign exchange losses, to ensure that currency risks do not jeopardise the central bank’s capital.

In absolute terms, exchange rate differences in 2017 were also the largest so far, which was the consequence of the stock

of international reserves today being much larger than it was ten or more years ago. It is also the result of the monetary regime, within which the relative stability of the domestic currency exchange rate has been successfully achieved in the environment of appreciation pressures, due to which significant foreign currency purchases have been recorded in recent years. For comparison, at the end of 2003, the stock of international reserves stood at EUR 6.5 billion, and at the end of 2018, it stood at EUR 17.4 billion, so that the amount of foreign exchange rate differences for the same change in the exchange rate is now much larger.

As emphasised earlier in the paper, it is not usual or appropriate to make frequent and considerable changes to the currency structure of international reserves. However, in analysing the impact of the foreign exchange loss generated in 2017, it is interesting to observe that loss would have been recorded even if international reserves had been invested in any other global reserve currency. In 2017, the kuna as the CNB’s reporting currency strengthened against all reserve and

Figure 5 Rate of return on investment in world currencies and exchange rate changes against the euro in 2017 and 2018



Note: The negative percentage change of the exchange rate value of the currency against the euro marks the strengthening of the euro (axis x), and the return on investments in other currencies (axis y) is calculated from generic indices.

Source: Bloomberg.

major world currencies, which was actually the consequence of the noticeable strengthening of the euro against all of those currencies (Figure 4 – left), as well as, to a lesser extent, the strengthening of the kuna against the euro. On average, in 2017 the euro appreciated by 6.6% against major world currencies, mostly against the US dollar (by 12.4%), and the least against the Danish krone (by 0.2%).

In 2018, the situation was different (Figure 4 – right): the euro, as well as the kuna, weakened against the yen, the US and the New Zealand dollar and the Swiss franc, while they appreciated against other world currencies, mostly against the Australian dollar. Such a dispersion and the different directions of exchange rate changes only confirm the extent of the volatility and unpredictability of exchange rate movements, which can have a strong impact on the stock of international reserves when expressed in the domestic currency.

The same is evident from the ratio between exchange rate changes and average generic returns on investments in

different world currencies (Figure 5 combines the returns on selected currencies and their exchange rate changes against the euro). Thus, in 2017, even if the return on investments in individual world currencies that was higher than that on investments in the euro is taken into consideration, the total return on investment in such currencies was negative because of the very strong appreciation of the euro, i.e. due to exchange rate differences (Figure 5 – left). This additionally confirms that the investment of reserves in any of the shown world currencies in that year would eventually have been negative if shown in the kuna. In 2018, the final investment outcome would have been mixed (Figure 5 – right), but here too returns would have almost been cancelled out by exchange rate changes for a number of currencies. The realised exchange rate movements are also not an indicator of future developments, and there is always a high degree of unpredictability in the impact of exchange rate movements on investment returns of foreign exchange assets when expressed in the domestic currency.

5 Exchange rate differences and the financial results of central banks – international experience

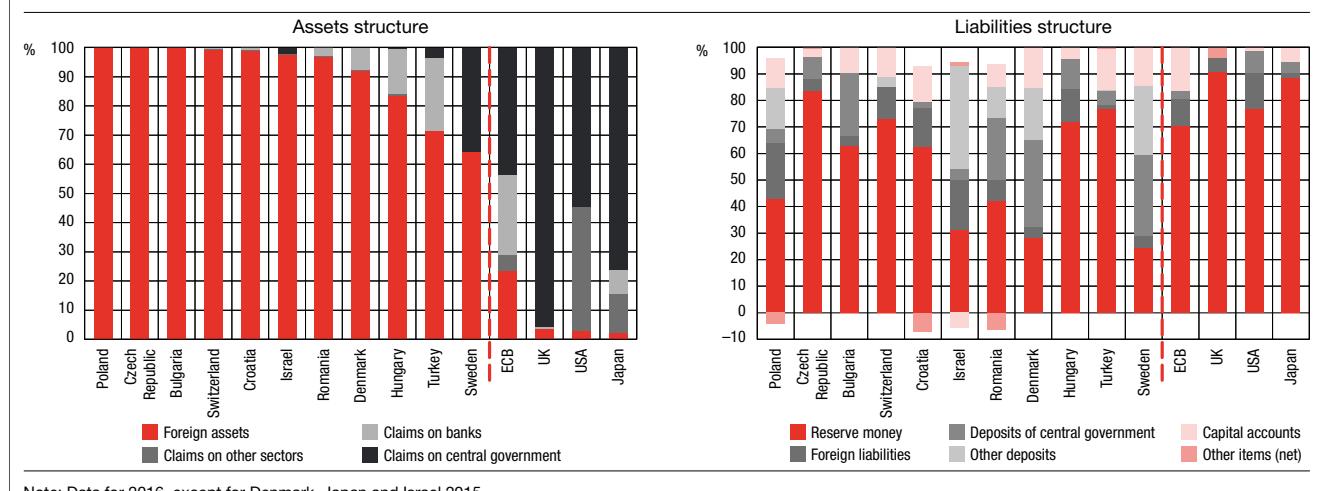
5.1 Do currency mismatches between assets and liabilities occur in other central banks?

In contrast to commercial banks, most central banks in small and open economies have structural mismatches between assets and liabilities because a considerable share of their assets is usually composed of foreign assets, i.e. foreign currency (international) reserves. At the same time, their liabilities are denominated in the domestic currency. While commercial banks can adjust their foreign currency positions in order

to hedge against currency risk and potential losses, by which they protect their shareholders, depositors and, finally, the deposit insurance systems, a central bank's primary motive is to achieve monetary policy objectives, in addition to the safety and liquidity in asset management that provides flexibility in the use of monetary policy instruments; only at the end is it concerned with profitability.

The currency mismatch between a central bank's assets and liabilities is particularly present in small open economies (Figure 6)⁸, in particular in those that have large external foreign

Figure 6 Structure of the assets and liabilities of central banks



8 A broader set of countries in the identical figure, but for the data for 2005, are shown in BIS (2009, pp. 103 – 104).

exchange transactions, so that capital inflows and outflows are reflected in the central bank's balance sheet. The currency mismatch often reflects the monetary regime applied by the central bank. This mostly refers to the monetary policy regime based on the maintenance of the stability of the exchange rate of the domestic currency, where foreign exchange interventions are the main instrument for the creation and withdrawal of reserve money. In such a situation, currency risk arises as a result of the decision to invest the proceeds of the creation of liabilities of the central bank (which is reserve money) in foreign assets.

As stated by the BIS (2009), there are two ways to reduce this currency risk, but they can hardly be implemented in practice. The first way to avoid a structural currency exposure is for the government, rather than the central bank, to own foreign currency assets for intervention, so that the central bank intervenes only as an agent, and does not hold foreign currency in the balance sheet. The second is for the foreign exchange assets in the central bank's balance sheet to be covered by foreign currency liabilities, for instance, from its foreign currency borrowings, which are available only to central banks with a high credit standing, and the BIS gives the example of the Bank of England. However, it would be difficult to implement this policy in practice, in particular because foreign currency liabilities of the central bank cannot be a substitute for domestic monetary liabilities, which exist in the balance sheet precisely due to the implementation of monetary policy.

With regard to the most important world central banks of large countries, whose currencies are at the same time global reserve currencies (USA, euro area, Japan and UK), it is obvious that foreign assets do not account for a large share of their assets (Figure 6 – Assets structure right). These central banks achieve their objectives by using instruments in their domestic currencies. Bank placements in the domestic currency, i.e. claims on the government based on collateral received as pledge for open market operations, are predominant in the assets. Recently, domestic assets mostly refer to government

securities purchased under the quantitative easing programme. Since with these central banks the interest channel is the main instrument for the implementation of monetary policy, as a rule, they also pursue a free floating exchange rate policy. The exchange rate of such currencies is determined in the global foreign exchange market, so that many more foreign exchange interventions would be required to impact foreign exchange movements.

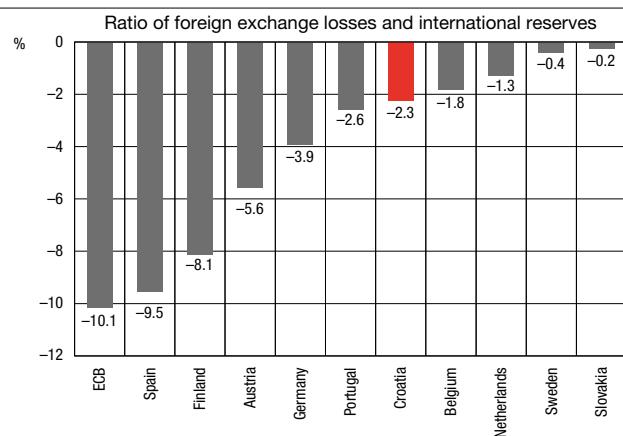
In the case of central banks with a relatively large share of foreign assets, the currency exposure is the largest source of their balance sheet volatility (BIS, 2009). Minimising or reducing this type of financial exposure cannot have precedence over the key monetary policy objectives, such as the stability of prices and financial stability. On the other hand, efficient balance sheet management is very important because it affects the adequacy of the funds and the ability to meet monetary policy objectives, while, as in the case of the CNB, exchange rate differences can have a considerable effect on the financial result and eventually on the allocation of profits to the state budget.

5.2 Exchange rate differences and examples of negative results

Since in 2017 the CNB had such large unrealised exchange rate losses, it is worth analysing how other EU countries have done with regard to currency risk. It is evident that many of them have realised a higher level of foreign exchange losses than the CNB, also due to the strengthening of the euro. The CNB's foreign exchange losses accounted for -2.3% of total international reserves, while exchange rate differences of the European Central Bank accounted for -10.1% of its reserves, for -9.5% of the reserves of the central bank of Spain, -5.6% of Austrian reserves and -3.9% of the reserves of the German Bundesbank. Despite the foreign exchange losses, none of the shown central banks reported a loss in 2017, which, to

Table 2 and Figure 7 Comparison of international reserves and foreign exchange losses of selected EU countries and the ECB in 2017

Euro area and EU countries	International reserves (end-2017, million EUR)	Foreign exchange losses in 2017 (million EUR)	Ratio of exchange rate differences and international reserves
ECB	62,084	-6,299	-10.1%
Spain	57,920	-5,524	-9.5%
Finland	8,766	-712	-8.1%
Austria	18,004	-1,005	-5.6%
Germany	166,967	-6,528	-3.9%
Portugal	21,788	-562	-2.6%
Croatia	15,706	-354	-2.3%
Belgium	21,829	-399	-1.8%
Netherlands	32,124	-415	-1.3%
Sweden	51,902	-203	-0.4%
Slovakia	3,022	-7	-0.2%



Sources: IMF and the Annual Reports of the shown central banks for 2017.

9 The same argument is also given by the Czech central bank in its Annual Report for 2017 because in that year it realised an extremely high exchange rate loss, stemming from exchange rate losses and gains, and the resulting negative value of the bank's capital recorded at the end of the year (CNB, 2017).

the largest extent, was the consequence of the application of the ECB's accounting rules (for more on the application of the ECB's accounting guideline, see Chapter 5.3).

The Swiss National Bank (SNB) can be cited as the best known example in recent times of the large impact that foreign exchange losses can have on the financial result. In the period of instability in financial markets during and after the global financial crisis, strong appreciation pressures on the Swiss franc, due to the increased demand for that currency as a safe haven, led to the SNB's large negative result in 2010 and 2015. The SNB's loss in 2010 amounted to CHF –20.8bn (10.2% of reserves or 3.4% of GDP), while in 2015, it reached CHF –23.3bn (3.9% of reserves or 3.6% of GDP). Despite the fact that the SNB pursues a monetary regime that is most similar to the inflation targeting that is implemented through the interest channel, while the exchange rate should fluctuate freely, the appreciation of the franc forced the central bank to introduce the zero lower bound on the exchange rate of the franc against the euro in the period from 2011 until the beginning of 2015, which the bank defended by interventions. As a result, the SNB's international reserves also grew strongly.

Such a large negative result also opens the question of its coverage, i.e. its impact on the central bank's capital. This was a topic of discussion of the speech made by the current Governor of the Swiss National Bank, Thomas J. Jordan in 2011. Jordan (2011) explains that for one reason a central bank cannot be compared with private enterprises: a central bank cannot become illiquid in the domestic currency. This institutional advantage gives a central bank the capacity to perform its tasks and achieve goals without being constrained if its capital turns negative⁹, while enterprises cannot operate in a similar situation, i.e. some legal procedures will follow (bankruptcy, liquidation or restructuring). As a result of this advantage and the fact that they create reserve money, in the long term, central banks should be able to rebuild their initial capital. However, a central bank's persistently negative capital can undermine the bank's credibility and its independence (Jordan, 2011, pp. 2 – 3), which reduces its financial strength and can jeopardise the achievement of monetary policy goals and mandate in general.

The same is also emphasised by the Bundesbank (2019),

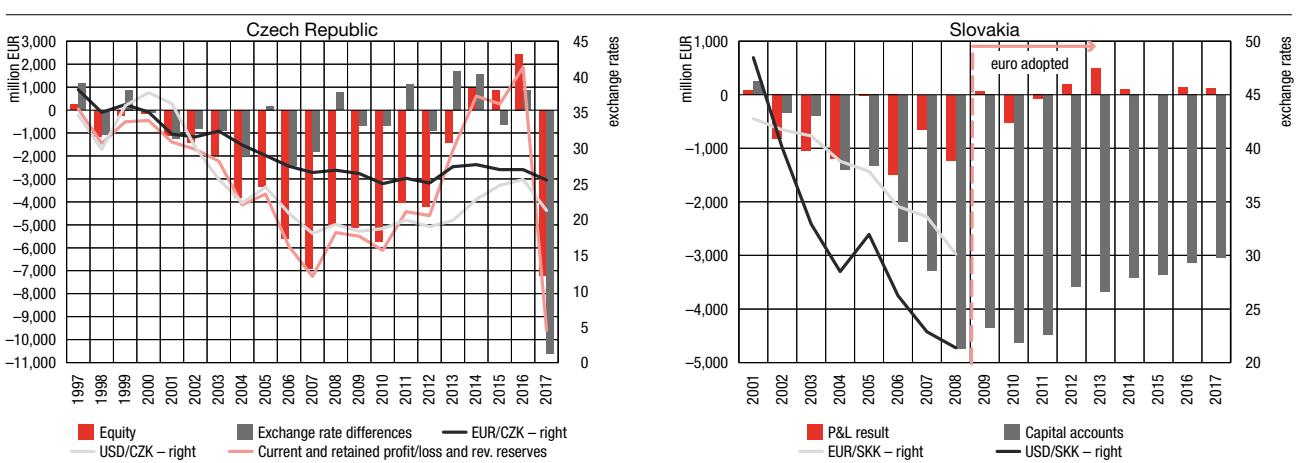
referring to the ECB (2016). Both institutions point out that the financial independence of the central bank implies its adequate capitalisation. Inadequate capital may have an unfavourable impact on the implementation of national tasks of the euro area central banks, and then, consequently on the joint implementation of monetary policy. In their empirical survey and using a model approach, Bindseil et al. (2004) also conclude that positive capital is a key tool for central banks to concentrate on achieving their basic objective – price stability and the implementation of monetary policy decisions in general. However, in the same paper, the authors also cite findings from literature according to which there are central banks that despite negative capital successfully control inflation. The recent empirical paper by Adler et al. (2016) also confirms that central bank financial strength and capital are a relevant factor in monetary policy implementation.

Therefore, although central banks are able to continue performing their tasks even in conditions in which they record negative capital in accounting terms, positive capital is a desirable precondition for a successful performance of institutional tasks and the maintenance of credibility and financial independence. Finally, if capital is not jeopardised, it means that the central bank is profitable. Irrespective of the fact that maximising profits is not a task of the central bank, its profitability, according to Chiacchio et al. (2018), is relevant at least for three essential reasons: from a fiscal perspective (as a source of governmental revenue), the ability of central banks to conduct their monetary policy referred to above and the fact that it can serve as an indicator of the quality of the pursued policies.

The central banks of Slovakia and the Czech Republic can be cited as examples in which foreign exchange losses from international reserves holdings led to losses that eventually resulted in negative capital (Figure 8). Their balance sheets also showed currency mismatches, so that strong appreciation pressures due to large foreign currency inflows and foreign investments led to foreign exchange losses.

In the Czech Republic, exchange rate differences led to large oscillations in the financial results as early as in the 1990s, when international reserves grew due to large privatisation-related foreign currency inflows and due to the fixed

Figure 8 Exchange rate movements, exchange rate differences and equity of the central banks of the Czech Republic and Slovakia



Sources: Annual Reports of the central banks of the Czech Republic and Slovakia.

exchange rate regime (Frait, 2005). A similar situation continued in the next decade, when the central bank continuously had a negative balance of total capital accounts (Figure 8 – left). Due to a long period of subdued inflation and recession in the years after the global financial crisis, and the fact that the central bank's reference interest rate, the main channel of monetary policy action, dropped to the zero lower bound, at the end of 2013 the Czech National Bank introduced the exchange rate floor at EUR/CZK 27 in order to prevent a further appreciation of the exchange rate. The bank defended this floor with frequent and significant foreign exchange interventions, aimed at boosting inflation towards the desired levels. This measure was in force until April 2017, and during these four years the central bank's profitability and capitalisation improved (due to the absence of foreign exchange losses). In the period from 2013 to 2017, the international reserves of the Czech central bank tripled due to large foreign currency purchases, from about EUR 40bn to over EUR 120bn (64% of GDP).

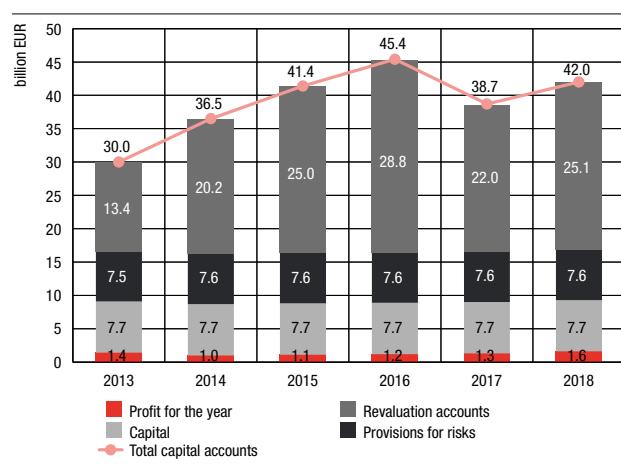
However, once the exchange rate floor was removed, the Czech koruna began to appreciate again against the euro, and even more strongly against the US dollar. Since the stock of international reserves reached an exceptionally high level, in 2017, large negative foreign exchange differences were recorded, and the Czech central bank generated a record loss, so that capital accounts became negative. Just as in the previous example of the Swiss central bank, the Czech National Bank (2017) in its annual report also mentioned that such a situation did not constrain its performance of prescribed tasks and the fulfilment of the price stability objective.

In Slovakia, which in the period until the adoption of the euro in 2009 also recorded a noticeable appreciation of the domestic currency against the euro and the dollar, exchange rate differences led to continuous losses, while capital accounts were already negative at the beginning of the past decade (Figure 8 – right). When the euro was adopted in Slovakia, the euro-denominated international reserves became the domestic currency asset, so that the impact of exchange rate differences on the central bank's financial results decreased, and it was noticeable that capital started to recover gradually. At the end of 2017, the Slovak central bank still had negative capital, but in the assets structure, the share of foreign assets did not even exceed 50%, i.e. it was considerably lower than that of peer countries that still had their own currency.

5.3 Accounting aspect and ECB Guideline

The ECB's financial result for 2017 showed significant foreign exchange losses. The reason was the same as in the CNB example: a noticeable appreciation of the euro against the US dollar, as well as against other currencies held by the central banks in their assets. The ECB's foreign exchange losses in 2017 stood at EUR –6.7bn, but despite this, the ECB's profit was positive at EUR 1.3bn, which was the consequence of the application of the ECB's accounting rules (ECB Guideline)¹⁰. The ECB Guideline allows for foreign exchange losses to be covered directly from the capital buffer created for currency

Figure 9 ECB's capital accounts and financial result



Source: ECB's Annual Report for 2018.

risks. In this way, the financial result, shown in the profit and loss account, is "secured" against the impact of foreign exchange losses. Unlike this, according to the IFRS accounting rules, which the CNB is currently required to apply in accordance with the Act on the CNB, exchange rate differences are first recognised in the profit and loss account and can determine the overall result, as was the case in 2017.

The ECB Guideline applies the approach by which unrealised gains and losses arising from exchange rate differences and changes in prices are recorded in revaluation accounts. In this way, at year end, foreign exchange losses have an unfavourable impact on the result in the profit or loss account only if they exceed (spend) the balance in the corresponding revaluation account. Since the balance in the ECB's revaluation accounts at the end of 2016 stood at EUR 28.8bn, foreign exchange losses in 2017 were easily covered from these accounts, and the ECB, instead of a loss, recorded a profit equal to the net income from its regular operation (Figure 9). In 2018, the ECB had foreign exchange gains on its foreign currency financial assets, so that revaluation accounts grew again, with a final financial result similar to that in the previous years. This is one of the key advantages of applying the ECB Guideline, which the CNB will apply in the process of the adoption of the euro in Croatia. In addition to adequate buffers, exchange rate differences should not distort the picture of the financial result of the CNB's operation. Thus, for example, had the CNB's financial statements for 2017 been prepared according to the ECB Guideline, with created buffers for exchange rate differences, the final result of the Income Statement for 2017 would have been positive, standing at HRK 100m, in contrast to the recorded loss of HRK 2,554m.

All euro area central banks that have to apply the ECB Guideline have recorded only positive financial results for years. Outside the euro area, many central banks rely on International Financial Reporting Standards (IFRS), but they often do not apply them fully, i.e. they include special national legislative solutions that again, in a certain way, take into account

10 Guideline of the ECB on the legal framework for accounting and financial reporting in the European System of Central Banks.

the specificities of central banks' operation (KPMG, 2012). Bunea et al. (2016) give an overview of the accounting frameworks applied by almost sixty central banks (classify them into four different categories), which only shows that there are different approaches.

Finally, as shown by Bunea et al. (2016), in general, central banks principally apply divergent rules as regards loss coverage and profit distribution, which is also the exclusive consequence of their national legislative provisions, because of which financial results often cannot be a good measure of

central bank performance. Nevertheless, they emphasise that, in the long run, profits strengthen the creditability of central banks and contribute to their financial independence, whereas rules that do not allow central banks to set up adequate reserves might have the opposite effect. Goncharov et al. (2017) show that central banks do care about whether they will have a positive performance, providing evidence that central banks are more likely to report small positive profits than small negative profits, in particular when there are strong pressures on the institution.

6 The look forward

The application of different accounting rules may have a large impact on the final financial result, in particular with regard to financial risk coverage¹¹. The choice of accounting rules is a matter for national legislation and international practice or obligations, such as in the case of Eurosystem, where national central banks of member states are required to apply the described ECB Guideline. The central bank is a specific institution or economic agent whose aim is not to maximise profits. Therefore, by virtue of its activity, it is more appropriate to treat individual accounting aspects differently than they are treated by commercial financial institutions, which the ECB Guideline recognises. As early as in 2004 (Foster, 2004), the evaluation can be found that the rules in accordance with the ECB Guideline (then, ESCB standards) are the closest to the accounting framework that takes into account the common specificities of central banks, in particular with regard to the recognition of profit and loss on foreign exchange differences.

The example of the CNB's financial results for 2017 and 2018 has shown that unrealised exchange rate differences on international reserves with the application of International Financial Reporting Standards may lead to losses, which can create pressure on the central bank that is often wrongly perceived as an institution that should never generate losses. Over the past years, many other central banks of the EU member states

also recorded foreign exchange losses, and in 2017, a large number of euro area central banks had a relatively larger foreign exchange losses than the CNB. There is a number of examples of central banks in which foreign exchange losses led to negative capital, while in the case of the CNB, capital was never jeopardised because during the years general reserves were created from foreign exchange gains, which serve precisely for the coverage of minuses, such as recorded in 2017 and 2018. However, only the future application of the ECB Guideline will provide a framework for the solution to the problem of such an impact of foreign exchange differences on the financial result.

The strategic decision on the adoption of the euro in Croatia¹², among other things, means that the CNB will start to apply the accounting rules of the European Central Bank during the process of adjustment. Until then, the CNB will prepare the financial statements in accordance with International Financial Reporting Standards that are primarily intended for entities whose aim is to generate profit and are not appropriate for the operation of central banks, taking into account their specific features. During the transition to the ECB Guideline it will be very important to create adequate buffers for all risks, including currency risk, so that exchange rate differences will no longer have a direct impact on the financial result.

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