

**Forex intervention and reserve management
in Switzerland and Israel since the financial
crisis: Comparison and policy lessons**

Alex Cukierman

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1. Introduction

- Switzerland and Israel are two small open economies whose central banks intervene in the forex market since the outbreak of the GFC. This talk compares the appreciation pressures on the currencies of the two countries, documents the similarities and differences between their methods of interventions and discusses their consequences for the size of forex reserve accumulation and their management.
- It is argued that the differences in methods of intervention and in the magnitude of reserve accumulation should be understood within the larger context of differences in the monetary policies of the Swiss National Bank (SNB) and of the Bank of Israel (BOI).¹ Those differences are caused, in turn, by structural differences in inflation, growth, openness (Switzerland: 119%, Israel: 58%) and safe haven considerations between the two economies.
- In both countries there are periods of discretionary interventions in which the central bank (CB) intervenes without preannouncing or committing to such policy in advance as well as periods of relatively “strong interventions” in which the CB commits to either maintain an exchange rate (ER) floor vis-à-vis the currency of a major trading partner (the Euro between 2011 and 2014 in

¹ In particular, the SNB policy rate hit the zero lower bound (ZLB) as early as 2011 when the Israeli policy rate was still in the neighborhood of three percent.

Switzerland) or to buy preannounced relatively large quantities of forex per period (Israel 2008-2009).

2. Forex intervention and reserves during the global financial crisis in Switzerland and Israel: Basic Facts

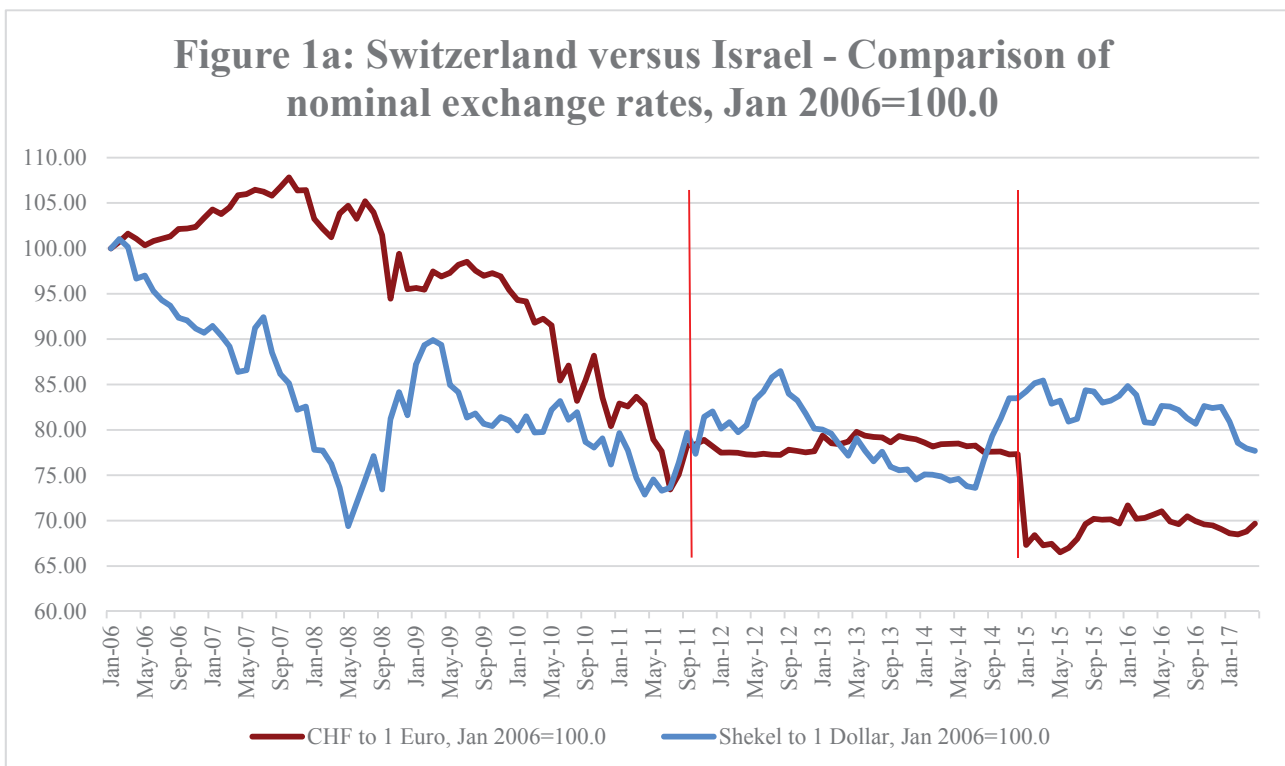


Figure 1b: Switzerland versus Israel - Comparison of nominal effective exchange rates, Jan 2006=100.0

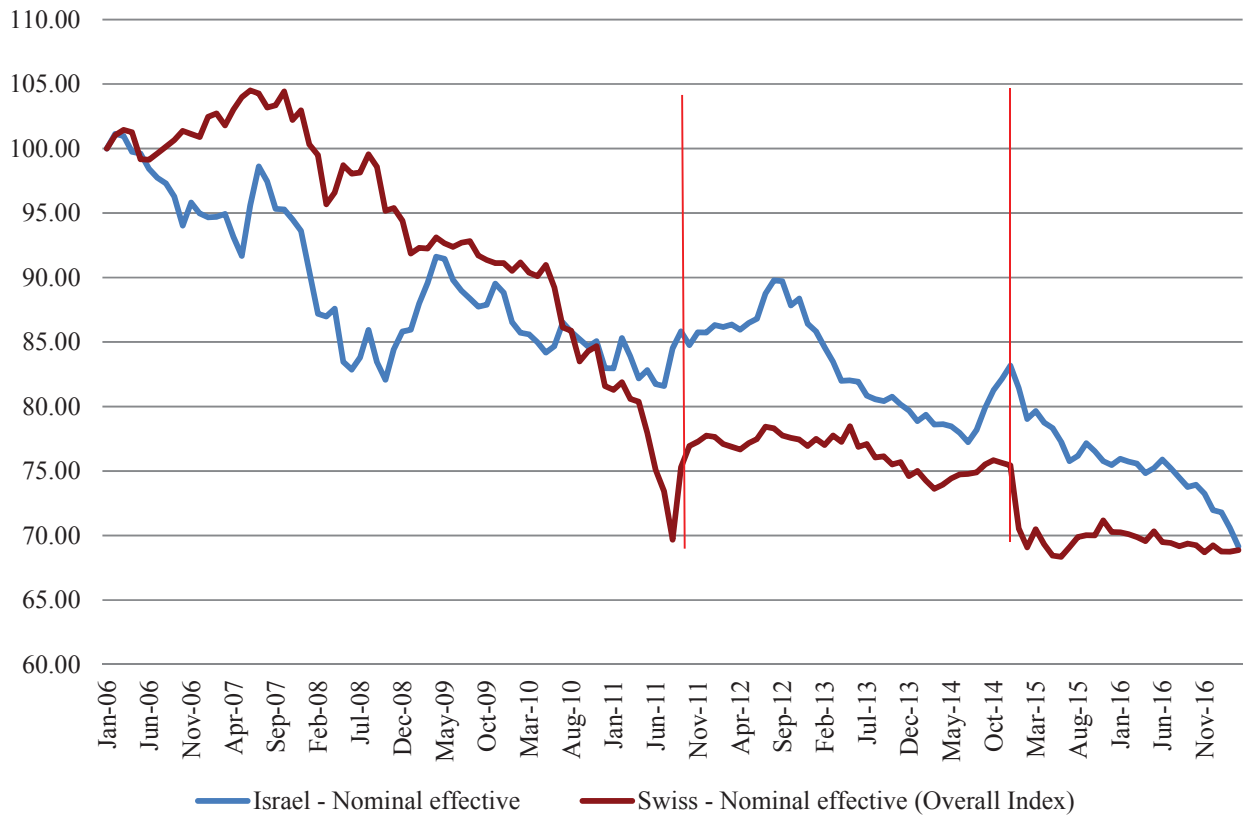
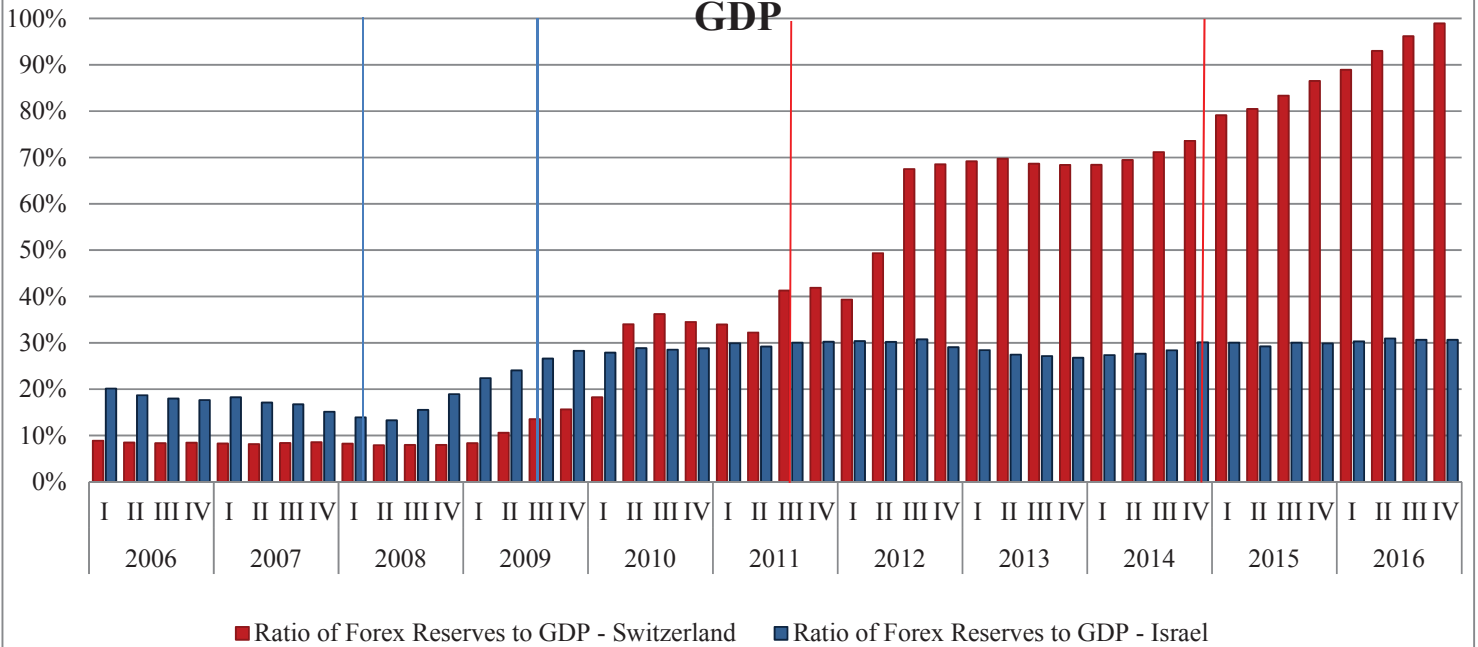


Figure 2: Switzerland vs Israel - Forex reserves as a share of GDP



Sources:

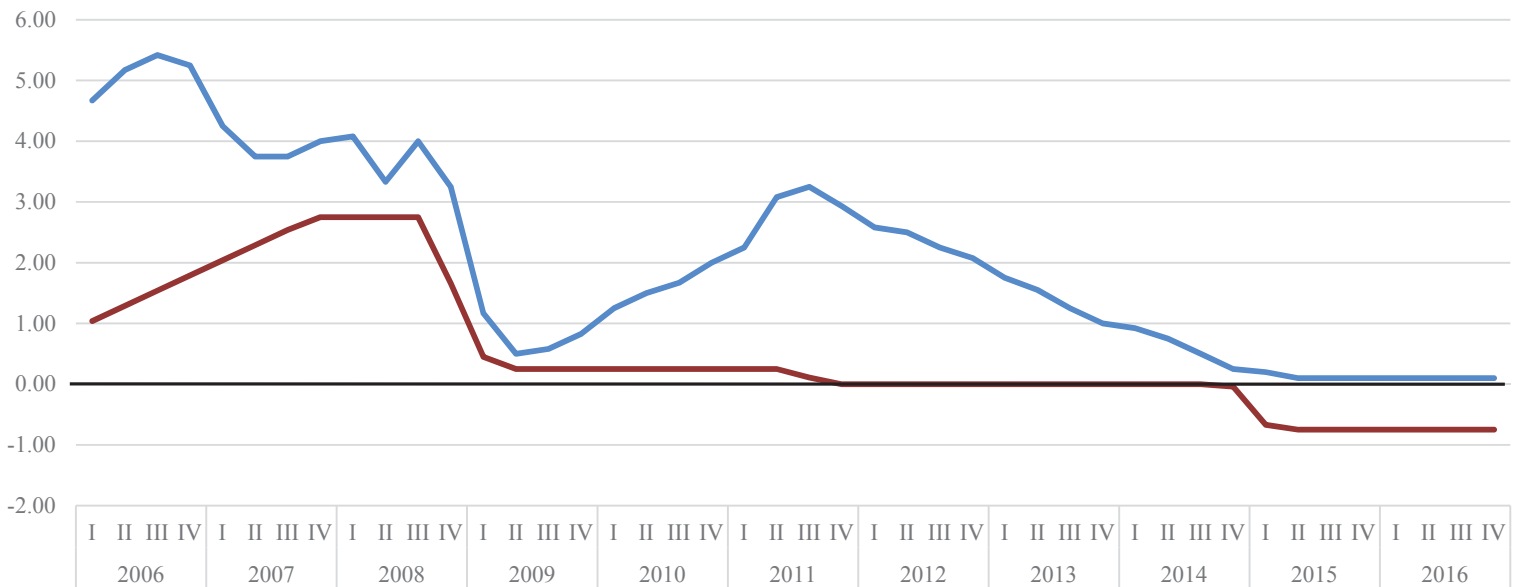
Switzerland: St. Louis Federal Reserve and SNB Data Portal.

Israel: BOI Statistics Portal

3. Forex interventions and monetary policy – Switzerland versus Israel

An important difference between the Israeli and Swiss forex interventions is that in the first case such interventions were sterilized whereas (from some early point and on) Swiss interventions were not sterilized at all. Swiss interventions are therefore akin to QE operations directed at foreign rather than domestic financial assets

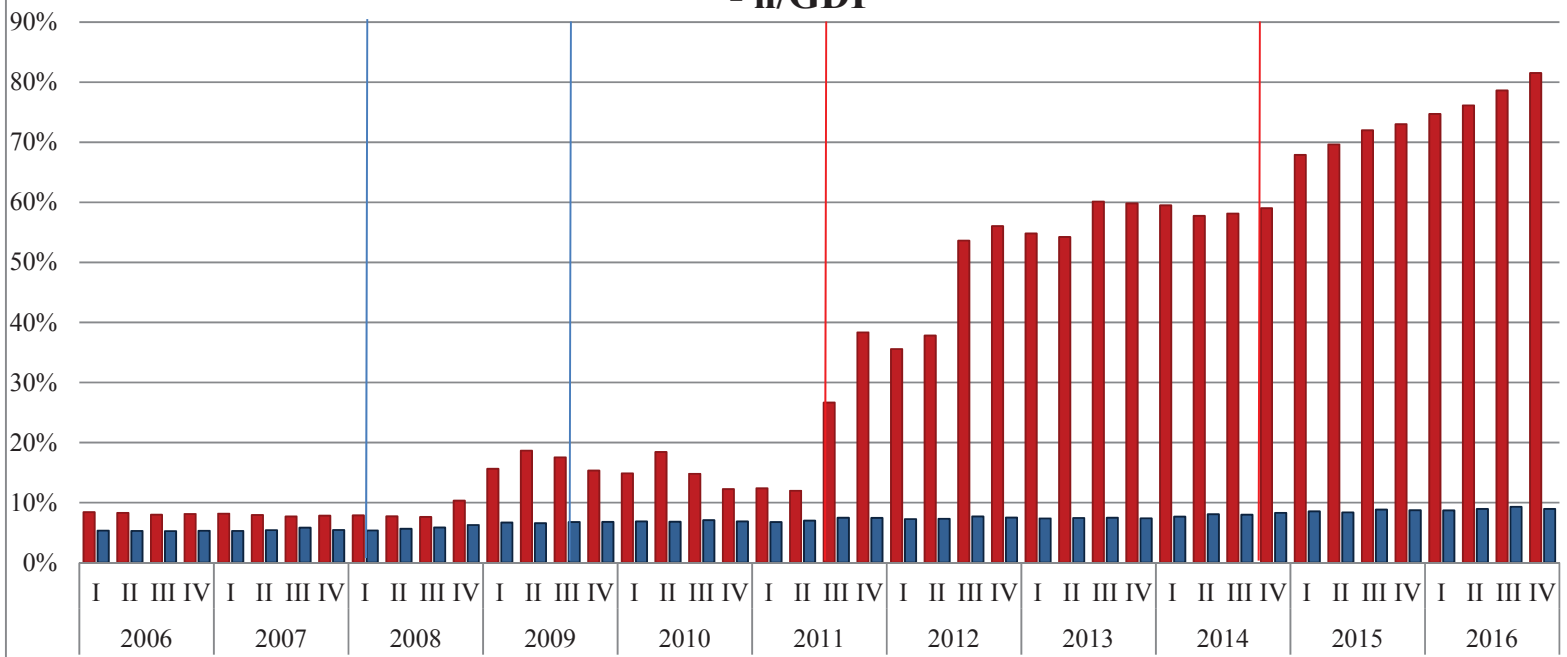
Figure 4: Israeli and Swiss policy rates



Sources:
 Swiss-<https://ieconomics.com/switzerland-interest-rate>
 Israel- BOI Statistics portal

— Swiss Interest rate — Israeli Interest rate

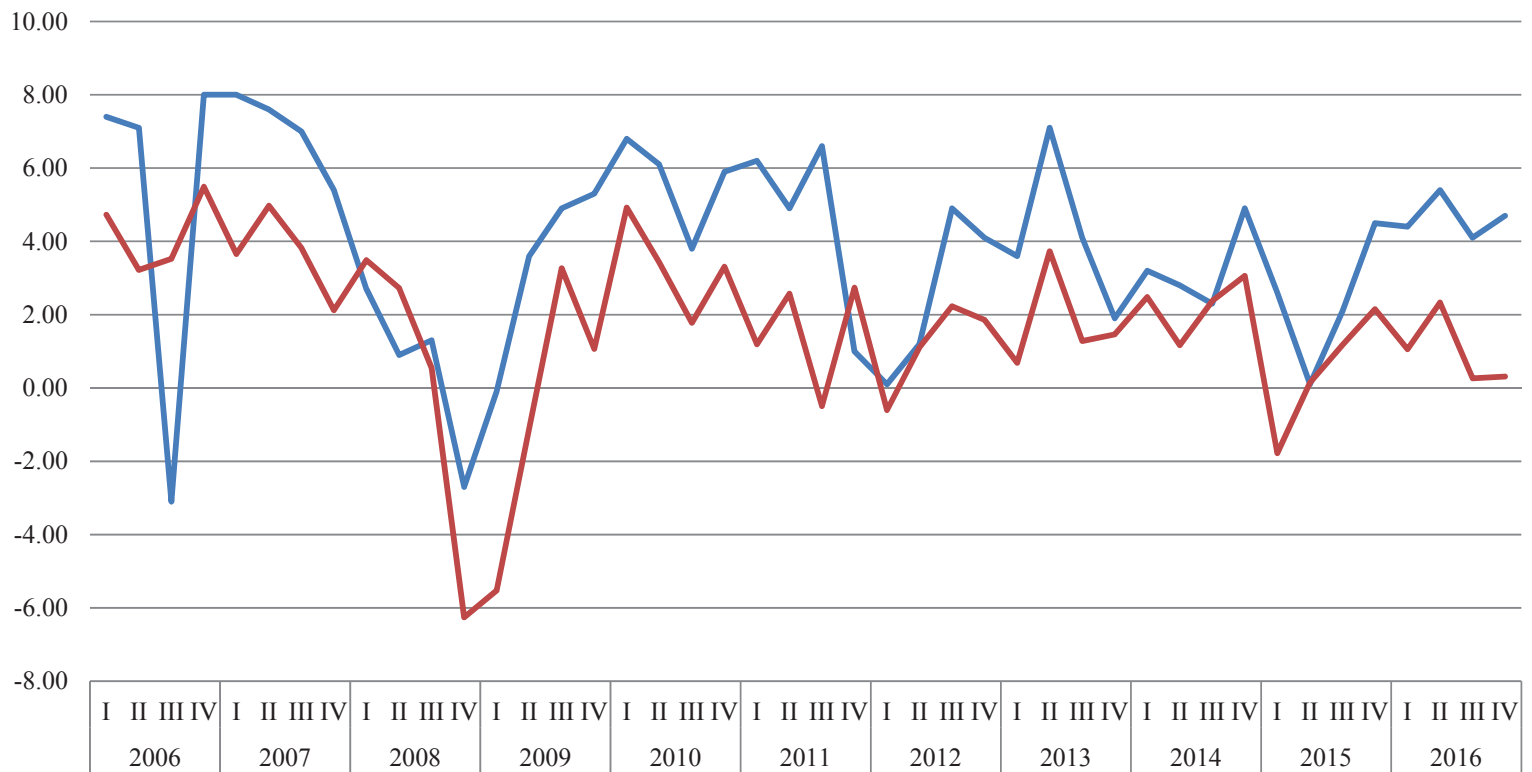
**Figure 6: Switzerland versus Israel: Monetary base as a share of GDP
- h/GDP**



Sources:
 Switzerland - St. Louis Federal Reserve Data Base and SNB Data Portal
 Israel - BOI Statistics Portal

■ h/GDP - Switzerland ■ h/GDP - Israel

Figure 3: Switzerland versus Israel - Quarterly changes in GDP at yearly rates (percentages)

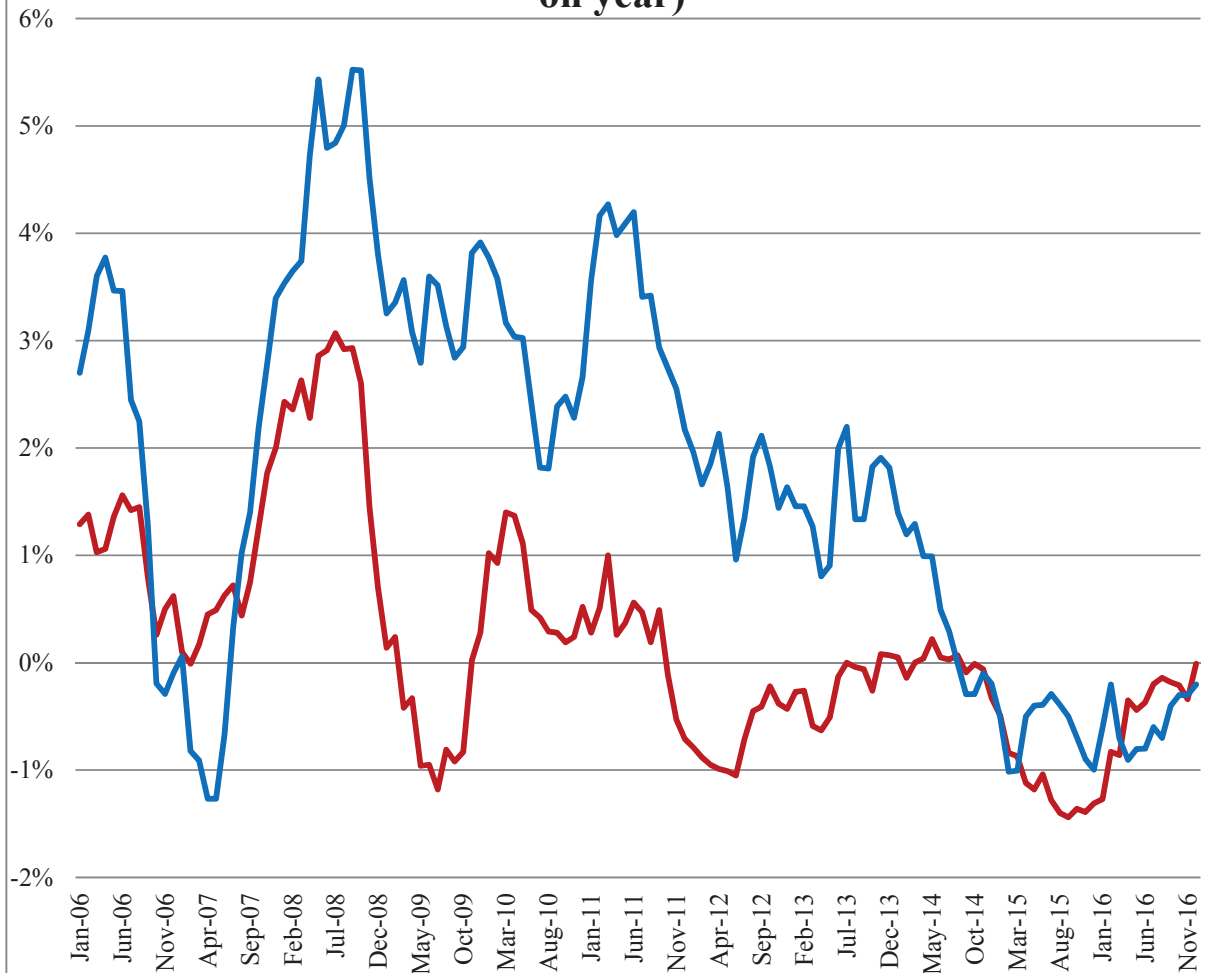


Sources:

Switzerland - SNB data portal - <https://data.snb.ch/en>

— Israel — Switzerland

Figure 5 : Israeli and Swiss Inflation (monthly, year on year)



Sources:

Swiss Inflation - Inflation.eu

Israeli Inflation - BOI statistic portal

— Swiss Inflation — Israeli Inflation

4. Some evidence on the effectiveness of intervention in Israel and Switzerland

Table 2: Elasticities of nominal and real effective exchange rates with respect to the EUR/CHF rate in Switzerland and with respect to the USD/ILS rate in Israel: 2016-2016

	Elasticity of Nominal Effective	Adjusted R-squared	Elasticity of Real Effective	Adjusted R-squared
wrt EUR/CHF for Switzerland	0.93	0.98	0.46	0.89
wrt USD/ILS for Israel	0.69	0.35	0.68	0.51

All the estimates are highly significant.

Recent work from the research department of the BOI reveals that, controlling for world demand for imports, a depreciation of one percent in the effective nominal and real ERs lagged two years induces an increase of between 0.3% - 0.6% in a quantity measure of exports. The corresponding sectoral elasticities range from a maximum of 1.4 for pharmaceuticals to a minimum of 0.31 for services. (Bank of Israel Report (2016), Hebrew, page 57).

5. Pros and cons of forex interventions in small open economies

- Conventional wisdom is that, at least during normal times, central banks should not interfere with the free operation of forex markets. This view presumes that forex markets correctly reflect the fundamental information in goods and financial markets, and that the resulting equilibrium is undisturbed by the existence of big players and that it is therefore efficient in some sense.
- However this is not always the case, particularly so during financial panics as recently demonstrated by the global financial crisis. In addition they are not always immune from the influence of big players such as central banks of large economies. When temporary expansionary monetary policies of major trading partners of a small open economy lead to appreciation of the domestic currency lack of reaction by the domestic CB exposes domestic producers to temporary foreign competition that may lead to permanent losses in production and employment.
- As long as the policy rate is strictly in the positive range, it may be preferable to offset the impact of foreign expansionary policies by means of interest rate policy. However this argument no longer holds when the ELB is reached. In this range the CB has to rely on unconventional monetary policies. In a relatively closed economy like the US such policies are implemented through the purchase of (mainly) domestic assets. By contrast, in small open economies like Switzerland and Israel they are achieved by the purchase of (mainly) foreign assets.²

² Besides Switzerland and Israel other small open economies such as South Korea, Sweden, the Czech Republic and Columbia engaged in direct foreign interventions in

6a. Should reserves be valued in domestic or in foreign currency? General answer: It depends on the purpose

- From a national point of view forex reserves can be viewed as one form of investment abroad. Hence arguments against “excessive” levels of reserves must have their roots in a belief that the resources invested in the creation of those reserves could have been used more efficiently for other purposes. For example if, due to potential conflicts with other objectives such as price stability and employment, it is necessary to sterilize the increase in the base the interest cost of sterilization becomes relevant as well. When this is the case and the return on reserves is lower than the cost of sterilization an argument against “excessive” forex reserve is that the CB loses money on those reserves.
- This argument is based on CB accounting in terms of domestic currency in conjunction with the fact that traditionally CB reserves are invested conservatively in high grade government obligations with relatively short maturities. Since the yield on such assets is low the return on reserves is often smaller than the interest cost of sterilization when such sterilization is implemented. In addition the accounting losses on the books of the CB are magnified by appreciations due to domestic currency accounting.
- An important function of forex reserves is to shield the importing capacity of the country from various economic and geopolitical events that may have undesirable effects on its capacity to import and to access international capital markets. This capacity depends on the forex value of reserves rather than on the domestic currency counterpart of reserves.

order to reduce the impact of negative rates cum QE operations in the US, the Euro area and Japan on their economies.

Internal procedures at the BOI allow for this difference by measuring the rate of return on reserves in terms of a numeraire of foreign currencies that reflect the main currencies Israel uses in its foreign trade. Nonetheless, for the purposes of domestic accounting and potential transfers of profits to the Treasury, rates of return are calculated in terms of domestic currency.

- By contrast the SNB utilizes domestic currency accounting for both purposes. Furthermore, in Switzerland the magnitude of CHF denominated profits of the CB is used to determine the size of profit distributions from the CB to the cantons and the federal government.

6b. Implications for calculation of the costs of intervention

- The national point of view implies that returns from holding reserves should be measured in terms of changes in the forex value of the obligations of the rest of the world toward the domestic economy. It also implies that sterilization costs should be calculated in terms of the relevant numeraire of foreign exchange rather than in terms of domestic currency.
- Beyond the previous considerations it is important to note that once desired policy moves to the ZLB or below it the cost of sterilization disappears and may even become a source of revenue. Thus, when appreciation pressures persist at the ZLB or below it forex intervention “buys” claims against the rest of the world by expanding the domestic monetary base in addition to slowing down the rate of appreciation.

Table 3: Returns on forex reserves in terms of forex numeraires and in domestic currency (percentages): Israel and Switzerland

Year	1	2	3	4
	Israel: Return in term of a forex numeraire	Israel: Return in domestic currency	Switzerland: Return in term of a forex numeraire	Switzerland: Return in domestic currency
2002	5.2	17.8	10.5	0.5
2003	2.2	-1.3	3.4	3.0
2004	1.7	1.8	5.7	2.3
2005	2.6	6.5	5.5	10.8
2006	3.8	-2.3	3.0	1.9
2007	6.9	-0.5	4.4	3.0
2008	6.0	1.6	0.3	-8.7
2009	1.9	3.6	4.4	4.8
2010	1.7	-7.1	3.8	-10.1
2011	1.3	7.9	4.0	3.1
2012	1.6	0.1	4.7	2.2
2013	0.9	-4.7	3.2	0.7

2014	1.3	8.7	5.1	7.8
2015	0.6	-2.5	1.3	-4.4
2016	1.6	-1.4	3.7	3.3

Sources:

Israel – BOI, Markets Division.

Switzerland – SNB Annual Report, 2016, p. 86. Columns 3 and 4 in the table correspond respectively to the fourth and sixth columns on page 86 of the report.

Main takeaway from table: In both countries forex denominated returns are higher on average and less variable than returns denominated in domestic currency.

6c. How to improve the tradeoff between leaning against appreciation and the cost of maintaining excessive reserves when the forex numeraire cost of intervention is positive?

- The short answer is: Raise the fraction of higher yielding but also riskier, longer term assets in the CB portfolio and engage in more active portfolio management than traditionally practiced by CBs
- There are at least two institutional ways for implementing the above:
- Continue to manage reserve within the CB but raise the fraction of stocks and other long term assets. To date this the case in both Switzerland and Israel.
- Transfer the management of reserves to a SWF

6d. An exploration of the SWF option

- The SWF option is normally implemented when, due to some real windfall or persistent forex intervention, there is a large accumulation of forex reserves. Creation of the Chinese SWFs is due in large part to past years of forex intervention while those of Saudi Arabia and Norway to the oil windfall.
- Although the source of accumulation in the second case stems from the discovery of a real resource there is a sense in which, beyond a certain point, accumulation due to interventions is also a windfall since it enables the CB of a country whose currency in high demand to acquire real

Table 4: Yearly returns of the Norwegian sovereign wealth fund in percentages (Returns are measured in terms of a relevant numeraire of foreign exchange currencies)

Year	Total	Equity	Fixed Income	Real Estate
	Return	Return	Return	Return
1Q2017	3.78	5.53	0.77	0.62
2016	6.92	8.72	4.32	0.78
2015	2.74	3.83	0.33	9.99
2014	7.58	7.9	6.88	10.42
2013	15.95	26.28	0.1	11.79
2012	13.42	18.06	6.68	5.77
2011	-2.54	-8.84	7.03	-4.371
2010	9.62	13.34	4.11	
2009	25.62	34.27	12.49	
2008	-23.31	-40.71	-0.54	
2007	4.26	6.82	2.96	
2006	7.92	17.04	1.93	
2005	11.09	22.49	3.82	
2004	8.94	13	6.1	
2003	12.59	22.84	5.26	
2002	-4.74	-24.39	9.9	
2001	-2.47	-14.6	5.04	
2000	2.49	-5.82	8.41	
1999	12.44	34.81	-0.99	

Real Estate return for 2011 is for 9 months

Source: <https://www.nbim.no/en/the-fund/return-on-the-fund>

obligations on the rest of the world by just issuing domestic high powered money. This is analogous to the ability of the US to extract seignorage revenues from the rest of the world to which Valerie Giscard-D'Estaing referred as an "exorbitant privilege" already in the sixties. (see also (Eichengreen (2011)).

Table 5: Comparison of the mean and standard deviations of returns on reserves, 2002-2016: Israel and Switzerland versus the Norwegian Sovereign Wealth Fund (SWF)

Country	Mean Return	Standard Deviation
Forex Reserves - Israel	2.62	1.94
Forex Reserves - Switzerland	4.20	2.27
Norway's SWF	6.24	10.65

Source: Calculated from data in Tables 3 and 4.

- Creation of a SWF raises important questions about two interrelated issues: How should the fund's resources be used and the identity of the fund's manager. There is widespread agreement that windfalls should be used mainly to fund long term national activities rather than current expenditures.
- The main options for management of the fund are the CB, an independent body or the Treasury. At first blush the management of a country's wealth would appear as an additional natural function of the Treasury. However historical experience suggests that, when managed by the Treasury, the fund may be used for the

financing of current budgetary expenditures rather than for the funding of long term national needs. It is therefore imperative to separate the management of a SWF from the current budgetary activities of Government.

- Another important question concerns the specification of the purposes for which the net profits of a SWF can be used. Whatever the ultimate institutional location of a SWF appropriate legislation should assure that its funds are used mainly for financing long term needs of the economy and its citizenry.
- Since the temptations to use returns from a SWF for regular budgetary expenditures are strong it is imperative that the list of items to be financed from this source be determined in advance by a public committee of experts and policymaker and cemented by law.
- Furthermore, the institution in charge of managing the SWF should be given enough independence to resist political pressure designed to divert funds to current government expenditures.
- I do not take a position on whether surplus reserves should be managed more aggressively by the CB or transferred to a SWF. But, in case a SWF is created it is important to implement the transfer of forex reserves from the CB to the fund in a manner that does not compromise the independence of the CB. This issue cannot be overemphasized since international experience suggests that CB independence is likely to be jeopardized by insufficient levels of CB equity capital (Stella (2005), Cukierman (2011)).

- One way to preserve CB capital is that the newly created SWF acquire the surplus forex reserves of the Bank by issuing equity and/or long term bonds to the Bank. Such assets would replace the transferred surplus reserves as assets in the Bank's balance sheet and preserve its equity capital without having to involve the Treasury Department.
- This proposal preserves the equity of the CB but does not offer a way to reduce the bloated base accumulation of a bank like the SNB that has engaged in massive forex interventions during the crisis. One way to enable the CB to do that after the creation of a SWF along the lines suggested in the previous paragraph is to make the equity and long term bonds of the SWF publicly traded. When the time comes this will enable the Bank to reduce its large monetary base, by selling the securities of the SWF on the open market.
- Finally, the SNB opposes the creation of a SWF inter alia on the ground that the conversion of any foreign-earned income into Swiss francs raises appreciation pressures. However it is likely that the weight given to this argument is somewhat exaggerated for the following reasons: First, given that only the profits from a SWF are used for current expenditures the amounts involved are small in comparison to the total stock. Second, in the course of natural economic activity part of the profits are likely to be spent on foreign goods for consumption and investm

