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Asset Price Bubbles and Monetary Policy: What can be learned from the Swiss Experience?

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This short policy paper looks at the implications of asset price bubbles for the Swiss economy over the two last decades, and attempts at inferring policy recommendations. We argue that such bubbles are generally damaging for the overall economy. Further, concentrating our attention on bubbles that are identified, we ask what kind of policy central banks should adopt in two given situations. We argue that in the case of housing price bubbles, emergency measures specifically directed at the housing market might be superior to conventional monetary policy; and that when faced with an emerging stock market bubble, an autonomous central bank of a small open economy should focus on the aftermath of the bust, taking advantage of its ability to conduct a policy tailored to the domestic needs.

JEL Codes: E32, E44, E52

Keywords: Monetary Policy, Asset Price Bubbles, Central Bank

1 Introduction

The widespread reduction and stabilisation of inflation in industrialised economies combined with a general rise in volatility on increasingly globalised financial markets have led central bankers and monetary economists to raise new questions about the relationship between asset prices and monetary policy. An issue that has recently received some attention is whether monetary authorities should react to suspected price misalignments on asset markets (bubbles).

In this regard, the activist position endorsed, among others, by CECCHETTI, GENBERG, LIPSKY, AND WADHWANI (2000) argues that asset price bubbles should be taken into account in the conduct of policy, in the sense that monetary policy should be somewhat tighter in the presence of an emerging bubble than it would have been in its absence. On the opposite, the conventional approach, defended by BERNANKE AND GERTLER (2000), says that

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asset prices should influence policy only to the extent that they provide significant information for future inflation and output.

RUDEBUSCH (2005) typifies the challenge set by an asset price bubble to monetary policy as a decision tree consisting of three conditions that must be cumulatively fulfilled to vindicate an activist policy. The first condition is whether the bubble can be identified, the second one is whether the bubble would result in significant macroeconomic problems that policy could not readily offset, and the third one is whether monetary policy is a good tool to deflate the bubble. In the present paper, we choose to ignore the first question, and focus solely on the remaining two, hence avoiding what happens to be the main source of disagreement between the two groups of proponents mentioned above. Using Swiss experience from the last two decades, we illustrate how damaging asset market bubbles can be for an economy, and attempt to assess the appropriateness of the use of monetary policy in two given situations.

Our approach is non-technical and descriptive. We focus on housing and stock market bubbles and argue that both kinds represent a serious threat to macroeconomic stability. Further, we argue that these should be handled differently from the perspective of a small open economy central banker. We explain why we believe that housing market bubbles may be reduced, albeit not with monetary policy; and why we think that in the case of a stock market bubble, the central bank should focus on the aftermath of the crisis.

It should be pointed out that we deliberately chose not to deal with the issue of what conditions are conducive to the emergence of bubbles on asset markets. Consequently, we do not discuss the set of pre-emptive policies a central bank could follow in order to avoid the formation of bubbles in the first place, and we condition our analysis of potential policy responses on the existence of identifiable asset price bubbles. Further, as we argue that monetary policy has no (or little) influence on equity prices in a small open economy, the central bank does not face a time-inconsistency problem that would enhance the likelihood of the emergence of bubbles. A small open economy central bank announcing that it will not intervene if an equity bubble bursts might be credible. Thus, it does not encourage investors to take up speculative activities based on expectations that monetary policy will rescue the market in the case of a crash.¹ Similarly, even if a small open economy central bank (credibly) announces that it will step in after the bust to

1 This may not be the case in a large economy.

mitigate the adverse effects of the crash on the real economy, this will not cause more speculation ex-ante due to the central bank's lack of influence over equity prices.

The rest of the paper is organised as follows. Section 2 describes the likely consequences of the housing price bubble of the late eighties and the "dot com" bubble of the late nineties for the Swiss economy. Section 3 presents and analyses the policy measures taken at the time of the housing bubble, section 4 discusses the available policy options of the Swiss National Bank (SNB) during the "dot com" bubble, and section 5 concludes.

2 Asset Price Bubbles and their Consequences in Switzerland

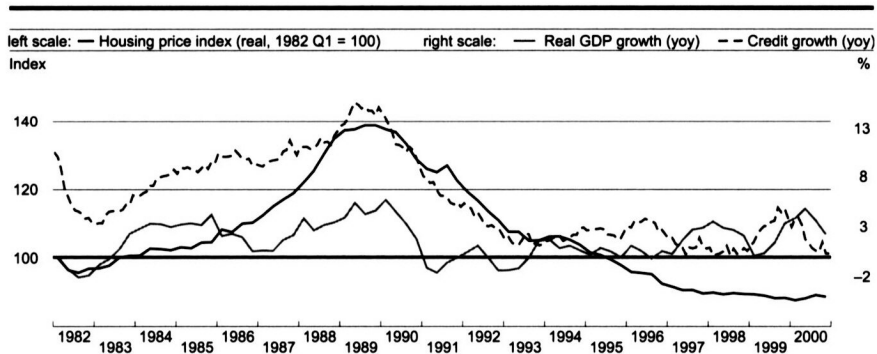
Whether monetary policy should react pre-emptively when a speculative bubble is identified on an asset market is the subject of debate among central bankers and academicians. As emphasised in RUDEBUSCH (2005), a necessary condition to justify a monetary policy reaction is that the bubble could result in significant macroeconomic problems. The mechanisms may go as follows. In the boom stage of a bubble, soaring credits are likely to boost demand, leading to an overheating and ultimately threatening inflation. Later, when the bubble bursts, collapsing wealth may weaken consumption (wealth effect) while sharply reducing the ability of households and firms to obtain credits (balance sheet effect). In the following, we briefly illustrate the possible adverse consequences of asset price bubbles on the overall economy using Swiss experience.

The Swiss economy recently went through two distinct periods later identified as ones of asset prices bubbles, which may have caused considerable damages to the real economy: the housing bubble of the late eighties and the – internationally widespread – so-called "dot com" bubble culminating in 2000.

Between 1976 and 1989, Swiss housing prices went up by more than 65% in real terms. After a mild increase up to 1987 that could well have been brought about by fundamentals, housing prices accelerated in 1987 and 1988, letting observers suspect the formation of a speculative bubble. In 1989 and 1990, real housing prices stagnated, and from 1991 on, they began to fall. This drop lasted for almost a decade, until real housing prices reached again their 1979 level in 2000. As can be seen from figure 1, following the bust of the bubble, credit growth decelerated rapidly and the Swiss econo-

my went into a recession characterised by virtually no growth during about six years.² Although other factors might also have been at work, such as the world business cycle and unfavourable interest/exchange rate movements, it is thought that the abrupt bust of the housing bubble worsened the situation of the real economy, contributing to prolong and deepen the country's "great depression" perceived by KEHOE AND PRESCOTT (2002) and KEHOE AND RUHL (2005). The VAR analysis in NATAL (1997) (which ignores housing prices) indeed suggests that exogenous changes in consumers' behaviour are to be considered the corner stone of the "six-year stagnation" puzzle. Moreover, beside the wealth effect affecting consumption directly, the balance sheet effect of an asset price crash, emphasised by BERNANKE AND GERTLER (2000) and by MARK GERTLER in: GERTLER, GOODFRIEND, ISSING, AND SPAVENTA (1998), might have played an important role here, given the heavily collateralised Swiss debt market³ (see the evolution of credit growth in 1990 and onwards in figure 1).

Figure 1: Housing prices, real GDP growth and credit growth



The second asset price bubble recently went across by the Swiss economy was the global "dot com" bubble of the late nineties. After decades of regular growth, international stock markets experienced a spectacular soaring in the second half of the nineties. Yet, massive price corrections began in 2000, letting equity prices fall back in 2003 to their 1997 levels. The heavy dependence of the Swiss economy upon the banking and insurance sectors

2 The housing price index displayed in figure 1 is a geometric average of a price index for houses and a price index for flats, both deflated with the CPI (the markets for houses and flats are more or less equally important in size in Switzerland).

3 About 90% of the total loans to the non-government sector are covered in Switzerland. Among these 90%, 70% to 75% are backed by real estate collateral (Source: SNB).

rendered the direct effect of the bubble bust on real activity particularly severe. Indeed, as can be seen in figure 2, between the third quarter of 2000 and the third quarter of 2001, at a time were most stock market indices were collapsing, the production of the domestic banking and insurance sectors, which usually makes up about 15% of real GDP, fell by some 16%. Roughly, this represents a negative contribution of 2.4% to overall GDP growth. In the wake of this widespread fall in stock prices, like most other industrialised economies, Switzerland entered a recession, as between 2001 and 2003 the country went through seven quarters of null or negative real GDP growth (see figure 3).

Figure 2: Stock market and the production of banking and insurance sector

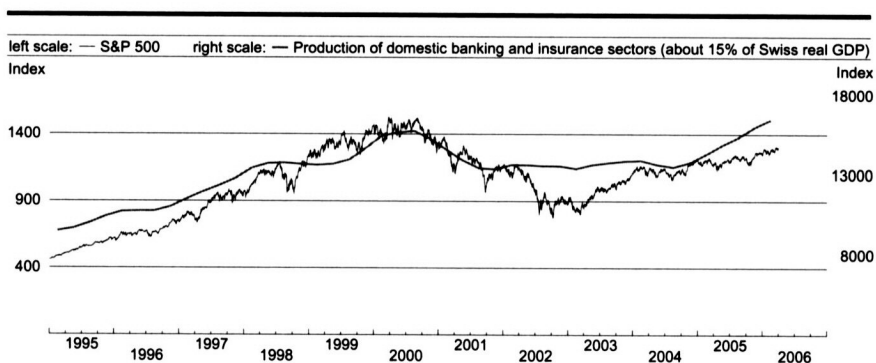
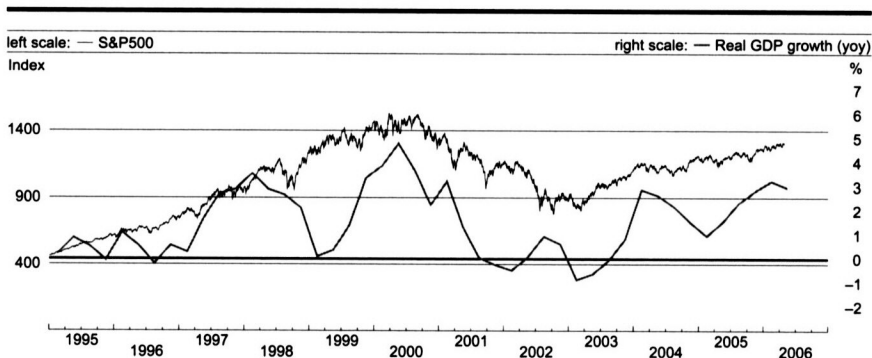


Figure 3: Stock prices and real GDP growth



This discussion suggests how damaging housing and stock market bubbles may be for the macro-economy. This risk, however, does not necessarily jus-

tify the use of monetary policy against an emerging bubble. We argue that there are cases where other instruments are more appropriate to abort a bubble, and others where nothing can be done to prevent the bubble from booming, but where a central bank can contribute to reducing the aftermath of the crisis. These issues are discussed in the following two sections.

3 Coping with a Real Estate Bubble

Even when a bubble is identified and its potential threat to macroeconomic stability is recognised, monetary policy might not necessarily be the right tool to deflate it. Using lessons drawn from the Swiss experience of the late eighties, we argue that monetary policy might not only be a crude and potentially inefficient instrument to deal with a housing market bubble, but also a very risky one. At the same time, we interpret this episode as evidence for the effectiveness of another kind of policy measures, one that affects temporarily the regulatory framework on the housing market.

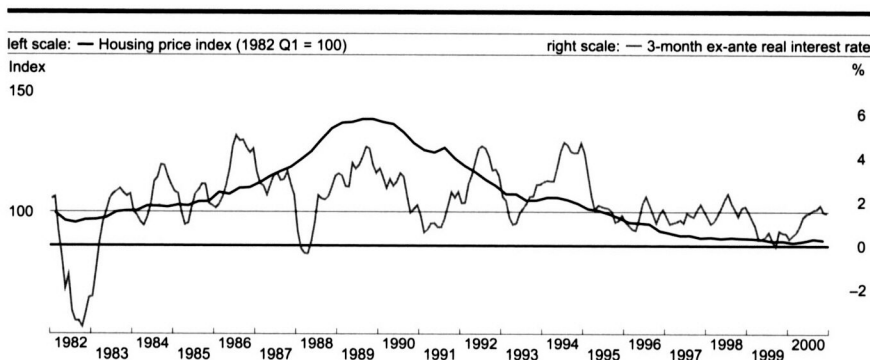
An intriguing feature of the Swiss housing price bubble of the late eighties (see, for instance, figure 1) is its relatively short period of clearly speculative nature. In fact, by international comparison, the boom stage of the bubble considered here turns out to be rather short. This naturally leads us to the question of what could have triggered the end of the soaring of housing prices in 1988–1989. As can be seen from figure 4, using a constructed ex-ante real interest rate as an indicator of monetary conditions, it is rather unlikely that the bust of the bubble was caused by a monetary policy tightening.⁴ Indeed, the 3-month interest rate rise beginning in the middle of 1988 was the result of a policy that intended to counter the monetary expansion following from the October 1987 stock market crash and the gradual introduction of a new electronic interbank payment system (known as SIC) in mid-1987⁵, so that monetary conditions seem to have only become truly restrictive at the beginning of 1989. Given the time lags usually assumed for the transmission of monetary policy to prices, it is questionable that monetary policy alone

4 We use a 3-month interest rate as an indicator because it is the instrument referred to in the current SNB monetary policy concept. The ex-ante real interest rate displayed in figure 4 is constructed in the following way. A Box-Jenkins analysis leads to an ARMA(2,0) specification for inflation forecast. Every month, a 3-month ahead forecast of the Hodrick-Prescott ($\lambda = 14400$) filtered CPI (in level) is produced. The 3-month ahead forecast of the CPI is then extracted to compute the 3-month ahead forecast of inflation. The latter is then subtracted from the 3-month LIBOR to compute an ex-ante real interest rate. The thin horizontal line represents the average of the computed real interest rate over the sample and can be used to approximate for the neutral rate.

5 See PEYTRIGNET (forthcoming) for a detailed discussion of the monetary development in Switzerland during the period 1980–1999.

could have accounted for the contemporaneous slowdown of housing prices.⁶ The reason for this slowdown might well be elsewhere.

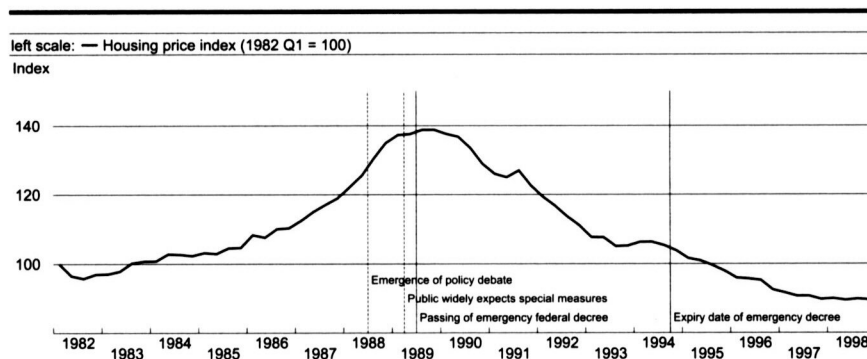
Figure 4: Housing prices and the real interest rate



A consideration of the regulatory changes occurring on the housing market during this period suggests that other elements might explain the end of the price boom during 1989. Initiated by left wing politicians worried about soaring rents, a policy debate about possible trade restrictions on the housing market emerged in 1988. After an initial rejection by the Swiss Parliament of a proposition for freezing housing prices in early 1989, most political groups came to support the introduction of a compulsory waiting period of 5 years after purchase for the resale of real estate assets. From the second quarter of 1989 on, the public could expect a soon adoption of the measure. In August of the same year, the Federal Government indeed adopted it as part of a package against speculation on the domestic housing market, and the emergency measure came into force in October. The timing of this special regulatory measure and the quasi simultaneous deceleration of housing prices (represented in figure 5) led many observers to recognise its effectiveness. We believe that the sole expectation of soon adoption from the market participants might have indeed quickly eliminated the incentive to speculate, thus hastening the end of the boom stage of the housing bubble.

⁶ Year-on-year (and quarter-on-quarter, not displayed in figure 1) real GDP growth only started to slow down in the second quarter of 1990, more than a year after the end of the boom stage of the housing price bubble.

Figure 5: Housing market bubble and the timing of special policy measures



Our view of the elements surrounding the bust of the housing price bubble of the late eighties in Switzerland suggests that the tightening of monetary policy might have only become effective as housing prices had begun their way down and the Swiss economy was already entering a downturn in 1990–1991. Although the SNB purpose behind the monetary tightening in 1988–1989 was to fight a subdued inflation and certainly not to prick the bubble, the case at hand perfectly illustrates the risk run by a central bank that tries to abort an asset price boom.⁷ Due to the lags inherent to the transmission of monetary policy, it is likely that a restrictive policy intended to prick a bubble might only become effective when the bubble has burst and the real economy has already entered a recession.⁸ In such a case, a monetary policy tightening might do nothing but contribute to sharpening the recession and potentially postponing the recovery.

In light of the arguments presented here, we consider that the advantages of special regulatory measures over the use of monetary policy in situations where an identified housing market bubble is threatening macroeconomic stability are twofold. On the one hand, such measures are efficiently and precisely directed at the housing market, as opposed to monetary policy which is likely to harm demand in the entire economy in an essentially undifferentiated manner.⁹ On the other hand, unlike monetary policy which could well become effective only after the bubble has burst of its own ac-

7 The SNB was following a monetary targeting regime between 1975 and 1999.

8 This issue has been formalized in GRUEN, PLUMB, AND STONE (2005).

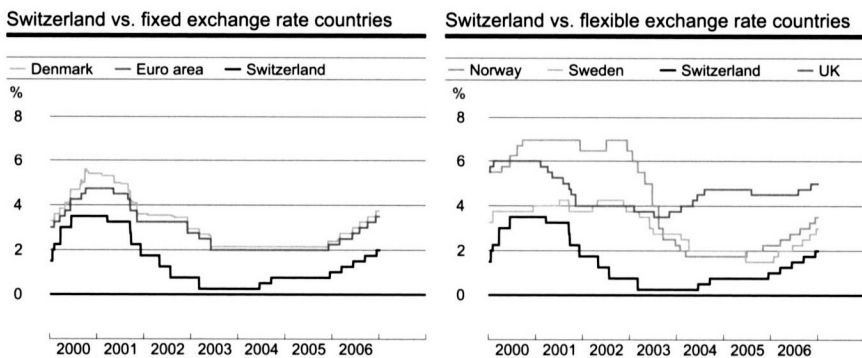
9 We are here referring to the direct effects of both policy measures. Of course, once the bubble bursts, the entire economy will generally suffer, whichever the instrument used to deflate it.

cord (possibly becoming procyclical), precise emergency regulatory measures are effective quickly.

4 Stock Market Bubble: Focusing on the Aftermath

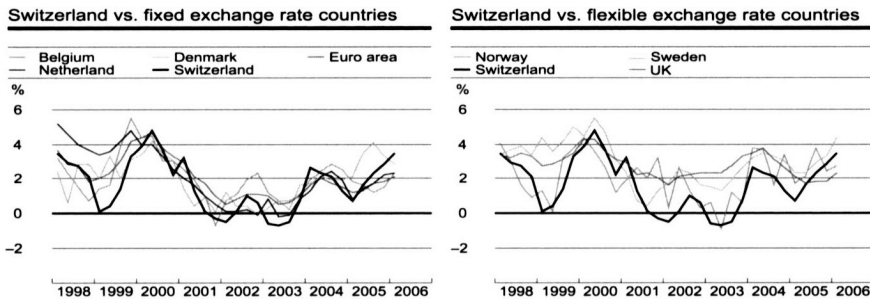
In a small open economy, conventional monetary policy might not easily influence the price of domestic stocks. Indeed, given the integration of global financial markets and the reliance of heavily capitalised domestic firms on international demand conditions, the central bank's control over short rates might not enable it to impact domestic stock prices. Thus, a small open economy central bank willing to lean against a stock market bubble would probably be unsuccessful. However, precisely because of its international integration, a small open economy with a comparatively large financial sector, such as Switzerland, is particularly vulnerable to potential equity market crashes. Yet, the country's monetary authority, when faced with the formation of a clearly identified stock price bubble, has no other option than to adopt a wait-and-see strategy and focus on the aftermath of the bubble bust. In this context, an autonomous monetary policy might prove useful. The central bank should theoretically be able to react to the bust in a tailored way, being looser than its foreign counterparts in order to compensate for the comparatively high vulnerability of the domestic economy to financial shocks. In addition, the exchange rate should act as a "shock absorber", since a quickly depreciating currency might accelerate and magnify the effectiveness of the monetary policy loosening. In the following, we try to illustrate the relevance and limitations of these claims using the Swiss post "dot com" bubble experience.

Figure 6: International comparison of central bank rates



As mentioned in section 2, the production of the Swiss banking and insurance sectors, which accounts for about 15% of GDP, fell dramatically in 2001 in the wake of the collapse of the “dot com” bubble (see figure 2).¹⁰ The monetary policy loosening undertaken by the SNB after the collapse of the bubble seems to have been more pronounced than that of neighbouring monetary authorities (see figure 6). The SNB began by slightly lowering interest rates in March 2001. Then, it responded to September 11 with two successive interest rate cuts, and kept on easing monetary conditions until it got very close to the zero floor in March 2003. In spite of this aggressive reaction, the effect of the bust on real activity seems to have been more important in Switzerland than in otherwise relatively similar countries (see figure 7). Indeed, the recession went through by the Swiss economy between 2001 and 2003 appears to have been deeper than that of most other countries represented here.

Figure 7: International comparison of real GDP growth (yoy)



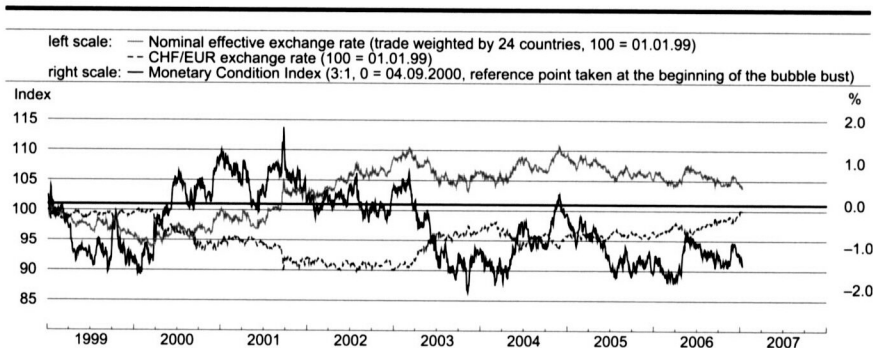
However, while monetary policy became expansive from the end of 2001 onwards from the perspective of the interest rate channel, its effects were initially countered by unfavourable exchange rate movements. As can be read from figure 8, between early 2000 and early 2003, the Swiss franc appreciated by more than 15% against a basket of foreign currencies constructed using trade weights.¹¹ It followed that rather than being able to effectively loosen the monetary conditions from the beginning of 2001 on, the SNB had to face the effects of the domestic currency appreciation, until the

10 Using the S&P 500 as a guideline, we consider that the “bubble burst” during the first week of September 2000.

11 An explanation often suggested for appreciations of the Swiss franc is the so-called safe haven effect, which says that in times of geopolitical uncertainties, currencies traditionally perceived as safe might become more attractive, thus appreciating. An illustration of this effect is the clearly distinguishable appreciation of the Swiss franc on September 11, 2001 (see figure 8). Note that the effective exchange rate is constructed in such a way that an upward movement means an appreciation of the Swiss franc.

conditions eventually became clearly expansive in mid 2003.¹² Hence, the effectiveness of the monetary policy loosening has probably been hindered by an appreciating exchange rate. Moreover, it is apparent from figures 6 and 8 that the monetary conditions were quite restrictive at the time where the collapse of the “dot com” bubble became clear.

Figure 8: Exchange rates and monetary conditions



This episode shows that while a small open economy with an autonomous monetary policy may in principle be able to adopt a tailored policy capable of offsetting the aftermath of an equity bubble bust, the task will rarely be simple. A main difficulty stems from the fact that the extent of the bubble bust and the one of its effects on the economy are uncertain, so that the speed and strength of the required interest rate move are difficult to gauge in real time. Another potential problem lies in the possibility that large external shocks to the exchange rate may impede the policy actions undertaken by the monetary authority.

5 Conclusion

In the eyes of the Swiss experience of the two last decades, it seems that asset market bubbles may seriously threaten macroeconomic stability. Once a bubble is identified and its menacing nature is recognised, policy makers face different possibilities depending on which asset market is concerned. In the case of a housing market bubble, even if monetary policy was able to put an end to a price boom, there would be more efficient and more quick-

¹² The nominal Monetary Conditions Index (MCI) shown in figure 8 consists of the 3M-LIBOR and one third of the deviations from the detrended log of the nominal effective exchange rate (trade weighted by 24 countries). See LENGWILER (1997) for details.

ly effective tools, such as special regulatory measures aiming at reducing the incentive to speculate on real estate assets. In addition to being effective more rapidly, these tools, unlike monetary policy, are not likely to unnecessarily harm demand in sectors of the economy where there is no overheating, thus reducing the risk of a recession following the bubble bust. On the other hand, a small open economy central banker facing a stock market boom might not have any alternative to adopting a wait-and-see strategy. Once the bubble collapses, however, a monetary policy response tailored to the exposure and resilience of the domestic economy may be implemented. An autonomous central bank can aggressively ease interest rates to counter the adverse wealth and balance sheet effects of the bust. The exchange rate channel may, in principle, boost and accelerate the effectiveness of the interest rate policy. However, precisely because of flexible exchange rates, this policy can also possibly be hindered by external shocks.

Still, we do not pretend to provide a set recipe for the correct policy handling of asset market bubbles. In particular, it must be reminded that our claims concerning housing market bubbles are conditioned on the assumption that the bubble is identified. In practice, this requirement may rarely be incontestably fulfilled, and disagreement among policy makers is likely to considerably delay the adoption of special measures of the kind we advocated here. In the same way, the identification of the collapse of a stock market bubble in real time may be much trickier than suggested by an ex-post inspection of stock prices. This difficulty to recognise a bubble bust on time may also seriously delay (and reduce the effectiveness of) the ease of monetary conditions required to limit the aftermath of the crisis.

Finally, it is worth mentioning that while the cases discussed in the paper suggest that policy may be able to limit the damages caused to an economy by asset prices bubbles, it could difficultly offset those completely.

6 References

- BERNANKE, BEN AND MARK GERTLER (2000), *Monetary Policy and Asset Prices Volatility*, NBER Working Paper 7559.
- CECCHETTI, STEPHEN G., HANS GENBERG, JOHN LIPSKI AND SUSHIL WADHWANI (2000), *Asset Prices and Monetary Policy: Four Views*, chap. 1, pp. 1–9. Center for Economic Policy Research, London.
- GRUEN, DAVID, MICHAEL PLUMB AND ANDREW STONE (2005), *How Should Monetary Policy Respond to Asset-Price Bubbles?*, *International Journal of Central Banking*, 1(3), pp. 1–31.
- KEHOE, TIMOTHY J. AND EDWARD C. PRESCOTT (2002), *Great Depressions of the Twentieth Century*, *Review of Economic Dynamics*, 5, pp. 1–18.
- KEHOE, TIMOTHY J. AND KIM J. RUHL (2005), *Is Switzerland in a Great Depression*, *Review of Economic Dynamics*, 8, pp. 759–775.
- LENGWILER, YVAN (1997), *Der “Monetary Conditions Index” für die Schweiz*, *Quartalsheft SNB*, (1), pp. 61–72.
- NATAL, JEAN-MARC (1997), *Switzerland’s Economy: Why the “Six-Year Stagnation”?*, *Analyse et prévisions*, Institut Créa, HEC Lausanne.
- PEYTRIGNET, MICHEL (forthcoming), *La lutte contre l’inflation à l’aide des objectifs monétaires intermédiaires*, in *Festschrift SNB 2007*.
- RUDEBUSCH, GLENN D. (2005), *Monetary Policy and Asset Price Bubbles*, *FRBSF Economic Letter*, 2005–18.

Betrachtungen zur Aussenwirtschaftspolitik **International Economic Relations: Notes & Comments**

Asset Price Bubbles and Monetary Policy: What can be Learned From the Swiss Experience? *Marcel R. Savioz and Julien Bengui*

9

Dieser kurze Aufsatz untersucht die Auswirkungen von Preisblasen von Vermögensanlagen auf die Schweizer Wirtschaft in den letzten zwei Jahrzehnten und versucht Empfehlungen für die Geldpolitik herzuleiten. Es wird gezeigt, dass solche Blasen generell schädlich sind. Ferner richten die Autoren ihr Augenmerk auf identifizierte Blasen und fragen nach der Politik, die Zentralbanken in zwei gegebenen Situationen verfolgen sollten. Im Falle von Immobilienpreisblasen dürften Notfallmassnahmen, die sich eigens an den Liegenschaftsmarkt richten, konventioneller Geldpolitik vorzuziehen sein. Zeichnet sich eine Blase am Aktienmarkt ab, sollte sich eine autonome Zentralbank einer kleinen offenen Volkswirtschaft auf deren Nachwirkungen konzentrieren und ihre Fähigkeit zur Führung einer auf die Bedürfnisse des Landes ausgerichteten Geldpolitik ausnutzen.

This short policy paper looks at the implications of asset price bubbles for the Swiss economy over the two last decades, and attempts at inferring policy recommendations. We argue that such bubbles are generally damaging for the overall economy. Further, concentrating our attention on bubbles that are identified, we ask what kind of policy central banks should adopt in two given situations. We argue that in the case of housing price bubbles, emergency measures specifically directed at the housing market might be superior to conventional monetary policy; and that when faced with an emerging stock market bubble, an autonomous central bank of a small open economy should focus on the aftermath of the bust, taking advantage of its ability to conduct a policy tailored to the domestic needs.

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