

Some Lessons from Six Years of Practical Inflation Targeting

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Abstract

My lessons from six years of practical policy-making include (1) being clear about and not deviating from the mandate of flexible inflation targeting (price stability and the highest sustainable employment), including keeping average inflation over a longer period on target; (2) not adding household debt as a new (intermediate) target variable, in addition to inflation and unemployment – not “leaning against the wind” but leaving any problems with household debt to financial policy; (3) using a two-step algorithm to implement “forecast targeting”; (4) using “four-panel graphs” to evaluate monetary policy ex ante (in real time) and ex post (after the fact); (5) taking a credible inflation target and a resulting downward-sloping Phillips curve into account by keeping average inflation over a longer period on target; and (6) not confusing monetary and financial policy but using monetary policy to achieve the monetary-policy objectives and financial policy to maintain financial stability, with each policy taking into account the conduct of the other.

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This paper discusses some of my lessons from six years of practical inflation targeting as a policy maker at the Riksbank (May 21, 2007-May 20, 2013). They are lessons mainly for central banking and monetary policy in Sweden, with its small very open economy and its special and oligopolistic financial sector. One thing I have learnt is that things are very different in different economies. The lessons may thus apply to varying degrees for other economies, depending how similar they are to Sweden in relevant aspects.

In summary, my lessons from my six years of practical inflation targeting as a policy maker at the Riksbank are the following: First, be clear about and do not deviate from the mandate for flexible inflation targeting – price stability and the highest sustainable employment. This means stabilizing inflation around the inflation target and unemployment around a long-run sustainable unemployment rate. To avoid any prejudice to the objective of price stability, keep average inflation over a longer period on target, as other inflation-targeting central banks successfully have done.

Second, do not include household debt as an additional target variable besides inflation and unemployment. Especially since “leaning against the wind” – a tighter policy than justified by the mandate of flexible inflation targeting – actually *increases* rather than reduces the household debt-to-GDP and household debt-to-disposable income ratios (Svensson 2013c). Leave any problems with household debt to the Finansinspektionen (the Swedish Financial Supervisory Authority) and its micro- and macroprudential instruments. Especially since the Swedish government in August 2013 (Swedish Government 2013b) announced a new strengthened framework for financial stability in Sweden, where the Finansinspektionen is assigned the main responsibility for financial stability and the control of all the micro- and macroprudential instruments.

Third, use a two-step algorithm to implement “forecast targeting”. In step 1, examine the effects on the forecasts for inflation and unemployment of new information and assessments for an unchanged policy-rate path, the policy-rate path from the previous policy decision. In step 2, adjust the policy rate and the policy-rate path so the forecasts for inflation and unemployment “look good,” that is, best stabilize inflation around the inflation target and unemployment around an estimated long-run sustainable rate. Use four-panel graphs to summarize these steps, where the four panels include the policy rate-path, the inflation forecast, the unemployment forecast, and the mean squared gaps (the mean squared deviations of inflation from the target and of unemployment from the estimated long-run sustainable rate).

Fourth, use four-panel graphs as one element in evaluating monetary policy *ex ante*, that is, in real time, meaning taking into account only the information available at the time of the decision. Use counterfactual experiments as one element in such evaluations *ex post*, that is, after the fact, meaning taking into account also information available after the policy decision.

Fifth, with a credible inflation target and anchored inflation expectations, the long-run Phillips curve is no longer vertical. Then, keep average inflation over a longer period on the target. Especially, do not let average inflation fall below the target, since this will cause average unemployment to be unnecessarily high.

Sixth, as far as I can see, flexible inflation targeting remains the best-practice monetary policy, before, during, and after the recent financial crisis. It was not monetary policy that failed before the crisis; it was supervisory and regulatory policies, that is, financial policy, that failed. Do not confuse monetary policy and financial policy. Use monetary policy and the monetary-policy instruments to achieve the monetary-

policy objectives (price stability and highest sustainable employment) and financial policy (micro- and macroprudential policy) and the financial-policy instruments to maintain financial stability. Conduct each policy separately, taking into account the conduct of the other policy, as with monetary policy and fiscal policy. Between the alternatives of the Modified Jackson Hole Consensus and Leaning Against the Wind Vindicated (in the terminology of Smets 2013), the former is the relevant one for Sweden. The new strengthened framework for financial stability in Sweden, assigning the main responsibility for financial stability and the control of the micro- and macroprudential tools to the Finansinspektionen, is in line with this.

The paper is organized as follows. Section 1 deals with the mandate of flexible inflation targeting, where flexible inflation targeting means that the central bank strives not only to stabilize inflation around the inflation target but also to stabilize the real economy. It compares the mandates for monetary policy of the Riksbank and the Fed and discusses how stabilization of the real economy can be specified. Section 2 discusses an issue much debated in Sweden and a source of deep division within the Riksbank Executive Board – whether household indebtedness should be an additional target for Swedish monetary policy and a justification for inflation below target and unemployment above a long-run sustainable rate. Section 3 deals with forecast targeting, how to choose the policy rate and the policy-rate path so as to best stabilize inflation and the real economy. Section 4 deals with policy evaluation both ex ante and ex post. Ex ante evaluation is about how flexible inflation targeting can be evaluated and the central bank held accountable for its policy in real time, taking into account only the information available at the time of the policy decision. Ex post evaluation is evaluation after the fact, taking into account also information on the outcome for the economy during the years after the policy decision. Section 5 discusses implications for the Phillips curve and monetary policy of the circumstance that inflation targets have become credible in the sense of private-sector inflation expectations having become anchored to the inflation target. Section 6 discusses any conclusions for monetary policy of the financial crisis and the relation between financial policy (micro- and macroprudential policy) and monetary policy. Section 7 summarizes my conclusions.

The lessons from the rather dramatic experience of forward guidance in Sweden during these years are not discussed in this paper; they are instead discussed in Svensson (2013a).

1 The mandate

Flexible inflation targeting involves both stabilizing inflation around an inflation target and stabilizing the real economy (Svensson 2010a). A clear objective for monetary policy contributes to monetary policy being systematic and not arbitrary. Furthermore, for central-bank independence to be consistent with a democratic society, it must be possible to evaluate monetary policy and hold the central bank accountable for achieving its objective. This requires that the degree of achieving the objective can be measured. A numerical inflation target allows target achievement with regard to inflation to be measured and the central bank to be held accountable for its performance regarding inflation stabilization. But if monetary policy also has the objective of stabilizing the real economy, that part of the objective must also be measurable, in order for monetary policy to be evaluated and the central bank be held accountable. Given this, how should stabilization of the real economy be measured?

Stabilization of the real economy can be specified as the stabilization of resource utilization around an estimated sustainable rate of resource utilization, accepting the conventional wisdom that the sustainable

rate of resource utilization is determined by nonmonetary factors and not monetary policy and therefore has to be estimated. But how should resource utilization be measured? More precisely, besides inflation, what target variable (or variables) should enter the monetary-policy loss function? One can answer this question by interpreting the legislated mandate for monetary policy and by examining what economic analysis suggests about a suitable measure of resource utilization.

The Riksbank's and the Federal Reserve's mandates

Let me start with the legislated mandate for monetary policy and compare the Riksbank's and the Fed's mandates. The Riksbank's mandate for monetary policy follows from the Sveriges Riksbank Act 1988:1385 and the preparatory works of the Act, the Government Bill 1997/98:4 to the Riksdag (Swedish Government 1997) that contained the proposal for this legislation. In Sweden, the preparatory works of laws carry legal weight, since they contain guidance on how the laws should be interpreted. According to the Riksbank Act, the objective of monetary policy is "to maintain price stability." The Bill further states (p. 1): "As an authority under the Riksdag, the Riksbank should, without prejudice to the objective of price stability, support the objectives of the general economic policy with the aim to achieve sustainable growth and high employment."

The idea in the Bill is hardly that there is any conflict or tradeoff between sustainable growth and high employment. Furthermore, for many years Swedish governments have emphasized full employment as the main objective for general economic policy.¹ Also, in this context, high employment should be interpreted as the highest *sustainable* rate of employment, if we accept that monetary policy cannot achieve any level of unemployment and that the sustainable rate of employment is determined by nonmonetary factors. According to this line of reasoning, the Riksbank's mandate for monetary policy is price stability and the highest sustainable rate of employment.

According to the Federal Reserve Act, the Federal Reserve should "promote effectively the goals of maximum employment and stable prices". Again, maximum employment should be interpreted as the maximum *sustainable* employment. Thus, according to this reasoning the Riksbank and the Fed have the same mandate.

The meaning of "without prejudice to the objective of price stability"

However, the Government Bill has the clause "without prejudice to the objective of price stability" preceding the statement about sustainable growth and high employment. What does it mean? I believe that the clause can cause, and has caused, some confusion. As far as I can see, it just means that average inflation over a longer period should be kept on target, and that allowing average inflation over a longer period to deviate from the target is to show prejudice to the objective of price stability.

To see this, note that it is not possible to keep inflation on the inflation target all the time, since the control of inflation is imperfect because inflation responds with a lag to monetary-policy actions and is affected by unobservable shocks. Thus, some deviations of inflation from the target is unavoidable and do not mean that the price-stability objective has been disregarded. However, it is possible to keep average inflation on target over a longer period, such as 5-10 years or longer. Thus, a deviation of average inflation from the target over a longer period can be seen as indicating prejudice to the price-stability objective.

¹ For instance, the Spring Fiscal Policy Bill 2013 states that that "the goal of the Government's policy is full employment" (Swedish Government 2013a, p. 23).

Also, even if average inflation over a longer period is close to the target, substantially higher variability of inflation than what monetary policy can achieve could be seen as indicating prejudice to the price-stability objective. But the phrase can hardly mean that the variability of inflation around the target should be the minimum possible that monetary policy can achieve, regardless of what volatility of the real economy such policy would imply. At least it has never to my knowledge been applied in practical policy that way. So, if the phrase has some sensible meaning, it is simply that a longer-run average of inflation should be close to the target.² This has actually been achieved by the central banks of Australia, Canada, and the UK from the mid-1990s and by the Fed and the ECB from 2000 until now, but not by the Riksbank, as discussed in section 5 below and in Svensson (2013d).³

A suitable measure of resource utilization

The Federal Reserve took a major step in clarifying its mandate in its statement on longer-run goals and monetary policy strategy in January 2012, amended in January 2013 (Federal Open Market Committee 2013). The Fed set an inflation target of 2 percent for annual PCE inflation, an action that joined the many central banks around the world that have set an explicit, numerical inflation target over the past two decades.

However, the Fed arguably took a world-wide lead in transparency by clarifying its interpretation of and weight on “maximum employment.” It emphasized that in contrast to inflation, the maximum level of employment is largely determined by nonmonetary factors that affect the structure and dynamics of the labor market, that these factors may change over time and may not be directly measurable, and that consequently it would not be appropriate to specify a fixed goal for employment; rather, the FOMC policy decisions must be informed by assessments of the maximum level of employment, recognizing that such assessments are necessarily uncertain and subject to revision. The FOMC reported that its participants’ estimates of the longer-run normal rate of unemployment had a central tendency of 5.2 percent to 6.0 percent, unchanged from one year ago but substantially higher than the corresponding interval several years earlier. The FOMC stated that in setting monetary policy, it seeks to mitigate deviations of inflation from its longer-run goal and deviations of employment from the Committee’s assessments of its maximum level, and that in circumstances when the objectives are not complementary, it follows a balanced approach in promoting them, taking into account the magnitude of the deviations and the potentially

² The phrase “without prejudice to the objective of price stability” or the fact that the Riksbank Act only mentions price stability whereas sustainable growth and high employment is only mentioned in the Government Bill is sometimes claimed to imply that the Riksbank’s mandate is a so-called hierarchical or single mandate, while the Federal Reserve’s mandate is a so-called dual mandate. With a hierarchical mandate, price stability is a primary objective and highest sustainable employment is a subordinate objective, while with a dual mandate price stability and highest sustainable employment have equal status. The phrase “without prejudice to the objective of price stability” is sometimes interpreted in this way, but as we have seen above, it is better interpreted as just longer-run average of inflation should be close to the inflation target. Then there is no practical difference between the mandates. As I point out in Svensson (2004), the issue can be understood by distinguishing between means and variances, what is known in statistics as first and second moments. With regard to mean inflation and mean employment, the mandate is hierarchical. The central bank sets just one target, which is the inflation target. The highest sustainable rate of employment is not set by the central bank; it is not determined by monetary factors but by the structure of the economy and the way it functions, and it may change over time. It can only be estimated, not set, by the central bank. With regard to the variance in inflation and employment, the mandate is dual. There it is a matter of stabilizing both, in an appropriate trade-off. This applies both to the Riksbank and the Federal Reserve.

³ To be precise, in the U.K. average inflation has been on target through 2007. Since 2008, inflation has been above target. However, with unemployment above a long-run sustainable rate, it is arguably optimal to keep inflation above target.

different time horizons over which employment and inflation are projected to return to levels judged consistent with its mandate. This places price stability and maximum employment on an equal footing as objectives of Federal Reserve's monetary policy. The Fed expressed this more clearly and directly than other inflation-targeting central banks have done in the past.

Whereas the FOMC statement emphasizes employment and unemployment as the relevant measurable target variables representing resource utilization, the Riksbank in a clarification of the implication of the Government Bill's statement writes at the beginning of every Monetary Policy Report that it,

in addition to stabilising inflation around the inflation target, [is] also striving to stabilise production and employment around long-term sustainable paths. The Riksbank therefore conducts what is generally referred to as flexible inflation targeting.

The idea here is also hardly that there is any conflict between stabilizing output and employment around a long-run sustainable path. Stabilizing employment around an estimated long-run sustainable path is in practice, at least when the participation gap can be regarded as small or at least exogenous, the same thing as stabilizing the unemployment gap, the gap between unemployment around an estimated, long-run sustainable rate of unemployment (LSRU).⁴

The above quote is followed by the sentence: "This does not mean that the Riksbank neglects the fact that the inflation target is the overriding objective." However, the phrase "the inflation target is the overriding objective" hardly has any other meaning than "without prejudice to price stability," which I have already discussed.

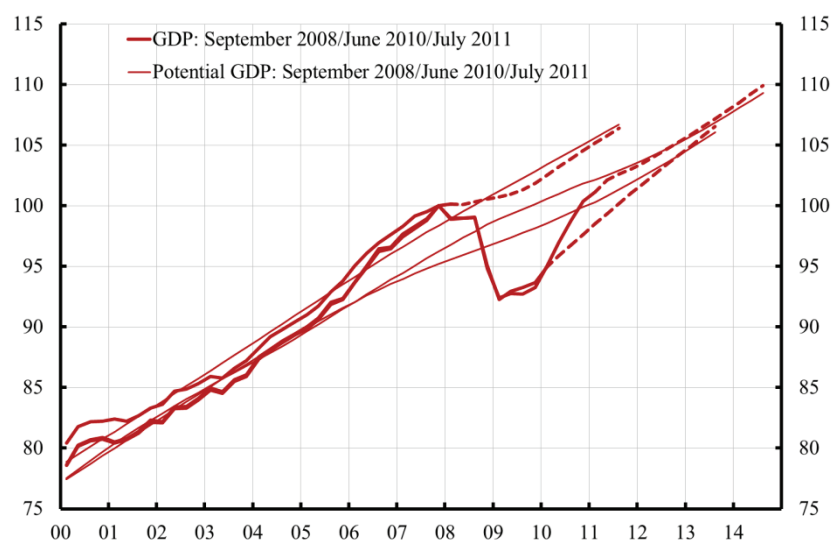
An alternative to stabilizing the employment or unemployment gap might be to stabilize another measure of resource utilization, namely the output gap, the gap between GDP and a long-run sustainable path for GDP, potential output. What does economic analysis say about the output gap as a measure of resource utilization? Estimates of potential output actually have severe problems. Estimates of potential output requires estimates or assumptions not only of the potential labor force but also of potential worked hours, potential total factor productivity, and the potential capital stock. Furthermore, potential output is not stationary but grows over time, whereas the LSRU is stationary and changes slowly. Output data is measured less frequently, is subject to substantial revisions, and has larger measurement errors compared to employment and unemployment data. This makes estimates of potential output not only very uncertain and unreliable but more or less impossible to verify and also possible to manipulate for various purposes, for instance, to give better target achievement and rationalizing a particular policy choice. This problem is clearly larger for potential output than for the LSRU.

As I have discussed in detail in Svensson (2011b), I believe the Riksbank's potential-output measures are problematic. They have shifted down substantially relative to pre-crisis levels (figure 1, from Svensson 2011b, figure 4). Potential outputs for September 2008 and June 2010 were constructed with a Hodrick-Prescott (HP) filter, which has a well-known endpoint problem, which implies that the output gap always

⁴ The employment gap between the rate of employment and a long-run sustainable rate of employment equals the labor-market participation gap less the unemployment gap, where the participation gap is the gap between the actual rate of labor-market participation and a long-run sustainable rate. In Sweden, the participation gap is currently considered to be small and stable. For the U.S., Erceg and Levin (2013) argue that the participation gap is significant and endogenous and has fallen in response to the recession. Then the unemployment gap needs to be adjusted for the participation gap in order to be consistent with the employment gap.

tends to be closed at the end of the forecast horizon (see, for instance, Apel, Hansen, and Lindberg 1996). Potential output for June 2011 is constructed using a new production-function approach, but it retains the properties of an HP filter, and potential productivity is still estimated with an HP filter. If the shock to the Swedish economy in 2008-2009 was mainly a shock to aggregate demand through a fall in exports, it is not clear why potential output would be much affected. Nor is it clear why past potential output would have to be adjusted so much that 2007Q4 comes to be considered a boom as high as the recession in 2009Q9 was deep, particularly given that in September 2008, the boom in the previous year was considered quite moderate.⁵

**Figure 1. GDP, Realized and Forecast, and Potential GDP, Sweden
Index, 2007Q4 realized GDP = 100**



Sources: Sveriges Riksbank and Statistics Sweden. Svensson (2011b, figure 4).

Note: For each date (September 2008, June 2010, and July 2011b), the thick solid line represents the most recently available estimates of realized GDP, the dashed line the Riksbank's GDP forecast, and the thin solid line the Riksbank's then-current estimate and forecast of potential GDP.

Compared to potential-output estimates, estimates of the LSRU are much easier to verify, more difficult to manipulate and can be publicly debated. Independent academic labor economists can and do provide estimates of the LSRU and can verify or dispute central-bank estimates. Several government agencies have labor-market expertise and provide verifiable estimates of the LSRU. One could even think of an arrangement where an independent committee rather than the central bank provides an estimate of the LSRU that the central bank should use as its estimate, to minimize the risk of manipulation by the central bank. Furthermore, unemployment is better known and understood by the general public than output and GDP.⁶

⁵ In figure 1, compare the large gap between 2007Q4 GDP and potential GDP as of June 2010 with the small gap between the 2007Q4 GDP and potential GDP as of September 2008.

⁶ Bank of England (2013) concludes in its discussion of monetary-policy tradeoffs and forward guidance that "[t]he best collective judgement of the MPC is that the unemployment rate is the most suitable indicator of economic activity, given present uncertainties about the evolution of supply."

Most importantly, it has much more drastic effects on welfare. As expressed by Blanchflower (2009):

Unemployment hurts. Unemployment has undeniably adverse effects on those unfortunate enough to experience it. A range of evidence indicates that unemployment tends to be associated with malnutrition, illness, mental stress, depression, increases in the suicide rate, poor physical health in later life and reductions in life expectancy. However, there is also a wider social aspect. Many studies find a strong relationship between crime rates and unemployment, particularly for property crime. Sustained unemployment while young is especially damaging. By preventing labour market entrants from gaining a foothold in employment, sustained youth unemployment may reduce their productivity. Those that suffer youth unemployment tend to have lower incomes and poorer labour market experiences in later life. Unemployment while young creates permanent scars rather than temporary blemishes.

When unemployment rises, the happiness of both workers and non-workers falls. Unemployment affects not only the mental wellbeing of those concerned but also that of their families, colleagues, neighbours and others who are in direct or indirect contact with them.

Thus, I think there are strong reasons to use the gap between unemployment and an estimated LSRU as the measure of resource utilization that the central bank should stabilize in addition to stabilizing inflation around the inflation target.⁷

Distinguish measures of resource utilization as an indicator of inflation pressure and as a target variable

I also believe it is important to distinguish between using measures of resource utilization as indicators of inflationary pressures and as target variables (Svensson 2011b). As an indicator of inflation pressure, it is the gap between the unemployment rate and a short-run NAIRU that is relevant. As a target variable, however, I am convinced that the relevant measure is the gap between the actual unemployment rate and the long-run sustainable rate. Using instead a short-run NAIRU as a target and stabilizing unemployment around it effectively implies introducing inflation smoothing as an objective, which makes little sense. This issue is discussed further in Svensson (2011b, online appendix A1). This is not to say that short-run slack in the economy should be disregarded. Short-run slack does have an impact on inflation and the inflation forecast, but it is only for that analysis that it matters.⁸

2 Should the household debt-to-income ratio be added as a target for monetary policy?

There is a lively current debate in- and outside the Riksbank about whether Swedish monetary policy should have an additional target variable, namely the household debt ratio (the debt-to-disposable income ratio). This has also been a source of deep division inside the Executive Board during my term there.

⁷ In Sweden, estimates of the LSRU relying on historical averages of the unemployment rate should take into account that average inflation falling below average inflation expectations since 1997 may introduce an upward bias in average unemployment as an estimate of the LSRU, as discussed in Svensson (2012b, 2013b).

⁸ Blanchard and Galí (2010) provide a model where a quadratic approximation of household welfare contains the squared gap between the unemployment rate and the long-run sustainable rate but the Phillips curve ends up containing the gap between the unemployment rate and a suitably defined short-run NAIRU.

Since the fall of 2012 it has become clear that a majority of the Executive Board justifies a policy that results in both inflation considerably below target and unemployment considerably above any reasonable sustainable rate with concerns about a high household debt ratio. It may at first not be obvious that the issue is about having a new target variable or not. But to allow poor current target achievement for inflation and unemployment with reference to the debt ratio must mean that for all practical purposes the debt ratio has become an independent target variable, or at least an intermediate target variable.

An intermediate target variable is a variable that is not a target in itself but is correlated with the target variables, for instance correlated with future target achievement for inflation and unemployment. However, a standard result in modern monetary economics is that there is no good reason to rely on intermediate targets – it is better to aim for the target variables directly (see, for instance, Svensson 1999). Thus, if the debt ratio is included because it is somehow correlated with the future outcome for inflation and unemployment, it is better to extend the forecast horizon for inflation and unemployment and incorporate the impact of the debt ratio on the forecast of future inflation and unemployment.

Riksbank concerns over the household indebtedness has led to a tighter policy

In their evaluation of Swedish monetary policy, Giavazzi and Mishkin (2006, p. 53-55, 71-73, 77-78) noted that policy seemed to have been too tight since the fall of 2003 because of concerns about housing prices. They criticized the Riksbank for having justified policy-rate increases with reference to rising household debt and housing prices, thereby creating confusion about the Riksbank's objectives for its policy. Indeed, they draw attention to a confusing statement in the Riksbank's February 26, 2006, press release that could be interpreted as the housing prices and household indebtedness having become targets for monetary policy:

The inflation forecast has been revised down slightly in comparison with the December forecast. ...

All in all, UND1X inflation is expected to rise gradually and to be close to the 2 per cent target a couple of years from now. This forecast is based on, for instance, the assumption of strong growth in Sweden and abroad and of gradual increases in the repo rate. *As before, there is also reason to observe that household indebtedness and house prices are continuing to rise rapidly. Given this,* the Executive Board decided to raise the repo rate by 0.25 percentage points at yesterday's meeting. Even after this increase, interest rates are relatively low from a historical perspective. [Italics added. UND1X was later renamed by the Riksbank to CPIX.]

Giavazzi and Mishkin observed that not only had the inflation forecast been shifted down, as noted in the first paragraph above, but the *Inflation Report* published on the same day showed an UND1X forecasts below the 2% target at every horizon. Furthermore, the second paragraph mentions the rise in house prices and household indebtedness as a reason why the policy rate was increased. They also observed that a similar reference to housing prices right before announcing the decision to raise rates was made in the press release of January 20, 2006. They noted that “[a] reader of this statement could easily conclude that the Riksbank is setting the policy instrument not only to control inflation, but to restrain housing prices.” That is, the statement gave the definite impression that the Riksbank had introduced housing prices and household indebtedness as new target variables for monetary policy in addition to inflation, and that the Riksbank could allow the inflation rate to undershoot the inflation target in order to restrain housing prices and indebtedness.

There are more recent statements that indicate that household debt may have become an additional target variable. In the July 1, 2010, press release (about the June 30 decision) a paragraph reads:

Inflationary pressures are currently low, but are expected to increase as economic activity strengthens. The repo rate now needs to be raised gradually towards more normal levels to attain the inflation target of 2 per cent and at the same time ensure stable growth in the real economy. The Executive Board of the Riksbank has therefore decided to raise the repo rate by 0.25 of a percentage point to 0.5 per cent. *Another factor is that household indebtedness has increased significantly in recent years.* [Italics added.]

The inflation forecast in the *Monetary Policy Report* actually shows the CPIF inflation forecast falling significantly below the inflation target except towards the end of the forecasting period where it hits the inflation target from below. The June 2010 decision is discussed more thoroughly in section 4 below. Does “factor” here indicate an indicator, a target, or an intermediate target for future inflation and unemployment?

The April 2013 press release has this paragraph:

Over the past year, the repo rate has been gradually cut to 1 per cent and monetary policy is currently very expansionary. There are now signs of a gradual recovery in the economy, at the same time as household debt is expected to increase from an already high level. However, it will take longer than was previously assumed before inflation rises towards the target. *An even lower repo rate today would mean that inflation attained the target somewhat more quickly, but at the same time it would further increase the risk of imbalances building up. The monetary policy conducted is expected to stimulate the economy and inflation at the same time as taking into account the risks linked to households' high indebtedness.* [Italics added.]

The April 2013 *Monetary Policy Update* (Sveriges Riksbank has this paragraph:

The increase in household debt as a percentage of their income is from an already very high level. *A high level of debt risks leading to poorer economic developments in the long run, with soaring unemployment and prolonged difficulties attaining the inflation target.* This is therefore something that monetary policy needs to take into account. The monetary policy conducted is expected to stimulate economic developments and inflation at the same time as taking into account the risks linked to high indebtedness.

Thus, whereas the press release refers to “risks of imbalances” the *Update* suggest that “a high level of debt risks leading to poorer economic developments in the long run, with soaring unemployment and prolonged difficulties attaining the inflation target”, without explaining through what mechanism this might happen. Clearly a coherent discussion and justification is needed.

In the July 2013 *Monetary Policy Report* (Sveriges Riksbank 2013e), the Riksbank provides more detail in the section “Alternative scenarios for the repo rate”:

A lower repo rate [by 25 basis points during 4 quarters] would mean, according to the calculations described here, that CPIF inflation approaches 2 per cent more quickly during the forecast period, compared with the main scenario (see Figure 2:19). Resource utilisation would also attain a normal level sooner (see Figures 2:21 and 2:22). *On this basis, one could justify a more expansionary monetary policy.* [Figures refer to figures in Sveriges Riksbank 2013e.]

But the monetary policy deliberations are also affected by other factors. One important factor is household debt. Experiences from other countries in recent years illustrate the risks of an overly rapid build-up of debt. A rapid increase in debt, even if it is not considered to threaten financial stability, could make the economy more sensitive to shocks. *A less expansionary monetary policy, which dampens the rate of increase in debt,* could then contribute to reducing the risk of major fluctuations in inflation and resource utilisation in the future (see the article “Financial imbalances in the monetary policy assessment”). [Italics added.]

Furthermore, in the article “Financial imbalances in the monetary policy assessment” (Sveriges Riksbank 2013e, p. 42-48), the Riksbank provides a figure with two alternative repo-rate paths. The Riksbank again suggests that the lower repo-rate path will increase household debt and increase any risks associated with household debt.⁹

This raises several issues. For instance, should not the addition of a new (intermediate?) target variable, with possible less target achievement for inflation and unemployment, be preceded by an open and thorough analysis of and conclusions about whether this is justified for economic and economic-policy reasons, including precisely what economic mechanism and channels of transmission are involved, including how the policy rate is supposed to affect the target variable and any risks connected with the target variable. And, importantly, is this addition consistent with the Riksbank Act and its preparatory works? I believe the legal argument should not be taken lightly, since it is through the Riksbank Act and the preparatory works that the Riksdag specifies the objectives for the Riksbank. But let me here leave the legal argument aside, and look at the economics.¹⁰ As discussed in Svensson (2012d), in order to justify the introduction of the debt ratio as an additional target variable besides inflation and unemployment, it seems that three claims must all hold true:

- (1) The level of household debt in Sweden today entails sufficiently large risks that it needs to be restrained.
- (2) A higher policy rate could, by restraining the debt ratio, tangibly reduce these risks, and the reduction of the risks thus achieved is worth the lower inflation and higher unemployment caused by the higher repo rate.
- (3) There is no better policy instrument available than the policy rate, with greater or the same effect on the risks and less effect on inflation and unemployment.

Let me examine claim (2) and (3), starting with claim (2). Crucial for this claim to hold true is that the policy rate has a *significant negative* effect on the debt ratio, that is, that a higher policy rate significantly reduces the debt ratio. Without a significant negative effect, it is difficult to see how any risks associated with the debt ratio could be affected. Furthermore, the magnitude of the effect on the debt ratio should be

⁹ “Two monetary policy alternatives have been illustrated in this article: a higher and a lower repo-rate path. During the usual three-year forecast period, the lower repo-rate path provides better expected target attainment in terms of inflation and resource utilisation. However, as *a lower repo-rate path can contribute to increased indebtedness*, it also increases the risk of an unfavourable scenario beyond the forecast horizon, for example in the form of a fall in housing prices in connection with a high level of household indebtedness.” (Sveriges Riksbank 2013e, p. 47, italics added.)

¹⁰ In spite of the Government Bill (Swedish Government 1997, p. 54) stating that “[t]he monetary policy instruments shall however, according the the Government Bill, only be used to maintain price stability.”

reasonably large in relation to the effect on inflation and unemployment; otherwise it would be difficult to argue that the reduction in risks would be worth more than the increased unemployment and reduced inflation.

Extensive research and several inquiries, including the Riksbank's own inquiry into the risks in the Swedish housing market, have reached similar conclusions.¹¹ This is that monetary policy normally has very little effect on housing prices and debt within a few years' time and, with low and stable inflation, no effect on real housing prices and real debt the long run.¹² A small effect on housing prices and debt means that there is no significant effect on any risks associated with household debt. Indeed, as Deputy Governor Charles Bean concluded in a paper for the Jackson Hole Symposium 2010 (Bean, Paustian, Penalver, and Taylor 2010):

[G]enerally speaking, monetary policy seems too weak an instrument reliably to moderate a credit/asset-price boom without inflicting unacceptable collateral damage on activity. Instead, with an additional objective of managing credit growth and asset prices in order to avoid financial instability, one really wants another instrument that acts more directly on the source of the problem.

A higher policy rate increases (not reduces) the debt ratio

However, a closer study of the issue actually reveals that a higher policy rate has a small *positive* effect, *not* a negative effect, on the debt ratio. That is, a higher policy rate *increases* the debt ratio rather than reduces it. Svensson (2013c) shows that a higher policy rate leads to a *higher* debt ratio, not a lower one. This result may be surprising to some, at least at the Riksbank, which has apparently made a sign error in its assumptions. The result is actually quite easy to understand once one carefully considers how debt, GDP and inflation are affected by a higher policy rate.

As explained in detail in Svensson (2013c), a higher policy rate during a year relative to a baseline leads to temporarily lower inflation, real GDP, and real housing prices for a few years, relative to the baseline. After 3-5 years, inflation, real GDP, and real housing prices have returned to the baseline.

The temporarily lower inflation leads to a permanently lower price level and permanently lower nominal GDP and nominal housing prices relative to the baseline. Lower nominal housing prices mean that new mortgages will be lower. But a year's new mortgages are only a small share, say 6-7 percent, of the total nominal (mortgage) debt. Since the turnover of the mortgage stock is so small, the total nominal debt will fall very slowly. The price level and nominal GDP will fall much faster to their new lower permanent level.

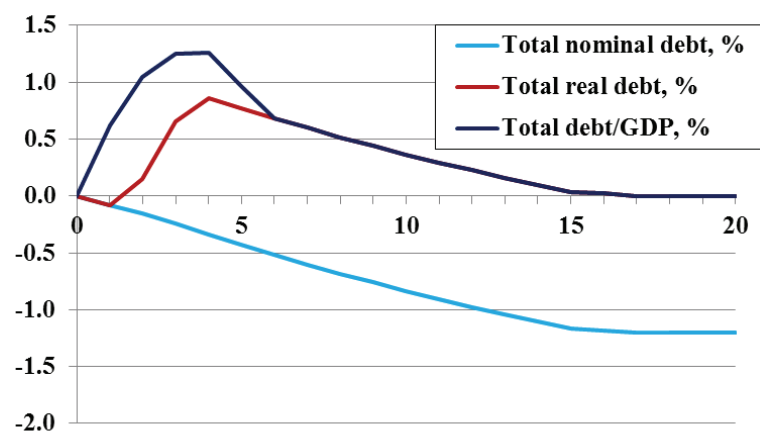
Since the nominal debt falls so slowly and the price level and nominal GDP fall much faster, the real debt will rise almost as much and as fast as the price level falls, and the debt-to-GDP ratio will rise almost as much and as fast the nominal GDP falls. After a few years when the price level and nominal GDP have

¹¹ See, for example, Assenmacher-Wesche and Gerlach (2010), Bean, Paustian, Penalver and Taylor (2010), Claussen, Jonsson and Lagerwall (2011), Englund (2011), Iacoviello and Neri (2010), Kuttner (2012), Svensson (2013b, 2013c), and Walentin and Sellin (2010).

¹² The addition "with low and stable inflation" is justified by the fact that the value of the tax deductions for interest rates and thus the real mortgage rate after tax depend on inflation, and the real mortgage rate after tax in turn affects housing prices and debt. With low and stable inflation, monetary policy has no long-run effect on the real mortgage rate after tax and thereby no effect on housing prices and debt.

reached their permanent lower level, real debt and the debt-to-GDP ratio start to slowly fall back towards the baseline. After more than a decade, they have returned to the baseline and the level they would have had in the absence of the temporary policy-rate increase. Figure 2 shows the response over 20 years of total nominal debt, total real debt, and the debt-to-GDP ratio, relative to the baseline, from a 1 percentage point higher policy rate than the baseline during year 1.

Figure 2. The response of total nominal debt, total real debt, and the debt-to-GDP ratio over 20 years from an increase in the policy rate of 1 percentage point during year 1, relative to the baseline.



Source: Svensson (2013c, figure 3.4).

Disposable income moves in the same direction as GDP but not as much. This means that the ratio of debt to disposable income, the debt ratio, also first rises during a few years, more than real debt but less than the debt-to-GDP ratio. Then it slowly falls back to the baseline. Thus, a 1 percentage point higher policy rate than a baseline during a year results in an increase relative to the baseline in the debt ratio of about 1 percent in 3-4 years, after which the debt ratio starts to fall back towards the baseline. After more than a decade it has returned to the baseline.

The Riksbank's justification for its tight policy is not valid

The conclusion is that a higher policy rate increases the household real debt and the debt-to-income ratio. The higher policy rate indeed reduces nominal housing prices and new mortgages, but since the new mortgages are such a small share of total mortgages, the total nominal debt falls very slowly. At the same time, nominal GDP and nominal disposable income fall much faster. The debt-to-GDP and the debt-to-income ratios rise. The magnitude of effect on the debt-to-income ratio, about 1 percent increase in the ratio after a few years for a 1 percentage point increase in the policy rate, is too small to have any effect on any risks associated with the debt ratio. And, importantly, it has the opposite sign than what the Riksbank has assumed. The policy rate clearly does not have a significant negative effect on the debt ratio. Thus, claim (2) is simply wrong! ¹³

¹³ In policy discussions and speeches, I have previously used as a rule of thumb (mentioned in the minutes from the monetary policy meeting in December 2012 (Sveriges Riksbank 2012c, p. 5) is that a policy rate that is raised by 1 percentage point in one step, held at this higher level for a year and then returned to its original level leads to a household debt ratio that is approximately 1 percentage point lower a couple of years ahead than would otherwise have been the case. This reasoning took for granted that nominal debt varies together with housing prices. Now,

As for claim (3), that there are no better instruments available, in Sweden the Finansinspektionen (the Swedish Financial Supervisory Authority) and the Government have taken or announced several effective measures, namely a mortgage loan-to-value cap (which has a clear effect on the loan-to-value ratio for new mortgages according to Finansinspektionen's *Swedish Mortgage Market Report* (Finansinspektionen 2013)), higher capital-adequacy requirements for systemically-important banks, and higher risk weights on mortgages. The Finansinspektionen in its *Mortgage Market Reports* also thoroughly monitors that mortgage lending standards are strict, that borrowers' debt-service capacity is good, and that borrowers' resilience to disturbances in the form of increased mortgage rates, increased unemployment, and housing price falls is sufficient. Thus, it seems difficult to argue that claim (3) holds true.

In particular, in August 2013, the Swedish government announced a new strengthened framework for financial stability (Swedish Government 2013b). The Finansinspektionen will have the main responsibility for micro- and macroprudential policy and control the micro- and macroprudential instruments. Assigning the main responsibility and control of both micro- and macroprudential instruments, including instruments such as the countercyclical capital buffer, to a single authority allows for both efficiency and accountability. A Stability Council will be created with the Minister of Financial Markets as the chair and with the Director Generals of the Finansinspektionen and of the National Debt Office and the Governor of the Riksbank as additional members. The Council will assess financial stability, manage crises, and publish their positions and assessments. Sweden should now have an effective framework for financial policy and financial stability.

Thus, even if claim (1) would be true, there does not seem to be any good reason to add the household debt ratio as another target or intermediate target variable for monetary policy. It is simply not consistent with the fundamental principles of instrument assignment in economic policy. As restated by Bini Smaghi (2013):

Whatever improvement we will make in our understanding of monetary policy, we should not depart from a few fundamental principles, in particular those related to assigning policy instruments to targets. Two principles are worth remembering in all circumstances. The first principle is that each instrument should be assigned to a specific target. The second principle is that the assignment should be based on efficiency, i.e. each instrument should be assigned to the target it can achieve most effectively.

More generally, variables such as the household debt ratio, real housing prices, and housing prices relative to disposable income are real variables, not nominal variables. That means that their long-run sustainable paths are determined by nonmonetary factors. Real housing prices, that is, housing prices deflated by a consumer price index, are the relative prices between housing and consumption. We know that monetary policy can affect nominal prices but not relative prices in the long run.

Some of us may be concerned about the risk of an accident at a nuclear power plant or the risk of an environmental disaster and global warming. Some might argue that a recession with less electricity demand reduces somewhat the risk of overheating a nuclear power plant and that a recession with less output reduces somewhat the emission of hazardous waste and carbon dioxide. Should we therefore use

taking into account that total nominal debt varies very slowly, it turns out that the magnitude of the effect is about the same, but that the sign is opposite.

monetary policy to try to reduce the risks of a nuclear-power accident or an environmental disaster and global warming? Most of us would agree that other policy measures should be used instead.

As noted, once claims (2) and (3) do not hold, it does not matter for the issue of whether monetary policy should try to restrain household debt whether claim (1) is true or not. However, for those that advocate such use of monetary policy, it would seem important to show that claim (1) is true. As far as I can see, the analysis of the risks connected with debt to which the Executive Board majority has referred to mainly consist of superficial comparisons with other countries, without a proper discussion of the causes and triggers of crises in other countries. "The Swedish debt ratio is at a level that has caused problems in other countries" is a typical statement, without further details. This does not seem sufficient to justify a policy that has had large consequences for unemployment and inflation. Claim (1) is further discussed in section 7.2 below.

3 Forecast targeting

With the mandate of flexible inflation targeting specified to stabilize inflation around the inflation target and unemployment around an estimated long-run sustainable rate, the policy choice boils down to what can be called *forecast targeting*: choosing a policy rate and a policy-rate path such that the corresponding forecasts for inflation and unemployment "look good," that is, best stabilize inflation around the target and unemployment around the LSRU.¹⁴ How can this be done in practice? How can all the relevant information be taken into account, including judgment, that is, information, knowledge and views outside the scope of a particular model?¹⁵ In this context we can actually talk about an algorithm for forecast targeting.

This algorithm can be summarized as follows. It consists of two steps. Consider a particular monetary-policy decision. In step 1, start from the policy-rate path and the corresponding (mean) forecasts for inflation and unemployment from the previous policy decision. Consider the new information about the current situation of and the outlook for the domestic and foreign economies that has arrived since the last policy meeting and that has an impact on the forecast for inflation and unemployment. For an unchanged policy-rate path, that is, for the previous policy-rate path, incorporate the new information in the forecasts for inflation and unemployment. They will then normally differ from the previous forecasts for inflation and unemployment. This procedure means that new information is "filtered through the forecast" – that is, information that has an impact on the forecasts for inflation and unemployment is taken into account, whereas information that does not have an impact on the forecasts is disregarded. This concludes step 1, which thus incorporates the new relevant information for policy in the forecasts.¹⁶

In step 2, consider whether the new forecasts for inflation and unemployment look good or not. If the previous forecasts looked good, and the new information has significantly shifted the new forecasts for inflation and unemployment, the new forecasts may not look good. If the previous forecasts did not look good, that is, if the previous policy decision was not good (or was constrained from being good, for

¹⁴ Forecasts are here considered to be mean forecasts, as discussed in, for instance, Svensson (2010a). See Svensson (1999, 2010a) and Woodford (2007) for more discussion and details of forecast targeting.

¹⁵ Monetary policy with judgment is further discussed in Svensson (2005).

¹⁶ Laséen and Svensson (2011) show that the equilibrium for an "unchanged policy-rate path" with new information is unique and well-defined provided that the given policy-rate path is understood to involve a switch to a well-behaved policy rule at some future date.

instance by the policy rate having reached its lower bound), the new forecasts would look good only by chance. If the new forecasts do not look good, consider alternative policy-rate paths and corresponding forecasts for inflation and unemployment until a policy rate and a policy-rate path has been found that results in the forecasts of inflation and unemployment looking good. This new policy rate and policy-rate path is then the new policy decision. Thus, step 2 selects the new policy rate and policy-rate path for given new information.

It then remains to announce the new policy decision, the policy-rate path, and the forecasts for inflation and unemployment in a statement and report that justify the policy decision.

Ideally, the report on monetary policy should report both steps 1 and 2, so as to best justify and explain the decision. In practice, step 1 is not published. Indeed, at least at the Riksbank, step 1 has been done explicitly in the policy process only very exceptionally and has, to my knowledge, never been published. Instead, only the new policy-rate path and the new forecasts of inflation and unemployment have been published. This makes it difficult to assess what of the change in forecasts is due to new information and what is due to a shift in the policy-rate path. Then it is difficult to assess the internal consistency of the decision.

Importantly, in step 1 the forecasts of inflation may change for an unchanged policy-rate path not only due to new information about the current state and outlook for the domestic and foreign economies but also due to new assessments of the impact of previous information on the forecast, new assessments of the transmission mechanism and working of the economy, and so on. For instance, in the April 2013 *Monetary Policy Update* the Riksbank adjusted down its inflation forecast due to a new assessment of inflation pressure in the Swedish economy. Also, in step 2, the changes in the forecasts from a given change in the policy-rate path may differ from previous changes in the forecasts for the same given change in the policy-rate path, due to new assessments of the response of the economy to changes in the policy-rate path. Such things need to be explained, in order to best justify policy and allow external evaluation of policy.

I find that so-called four-panel graphs, with the policy-rate path, the inflation forecast, the unemployment forecast, and mean squared gaps for inflation and unemployment as numerical measures of how good the forecasts look, are ideal for explaining the two steps. Step 1 could be illustrated with the previous policy-rate path and the previous and new inflation and unemployment forecasts, where the new forecasts take into account the new information show how it has affected the forecasts for unchanged policy-rate path.

Step 2 could be illustrated with the previous and the new policy-rate paths together with the new forecasts of inflation and unemployment for the unchanged and the new policy-rate paths. Such an illustration would be very illuminating, I believe. Unfortunately, four-panel graphs with this clear distinction between steps 1 and 2 are not published at the Riksbank.

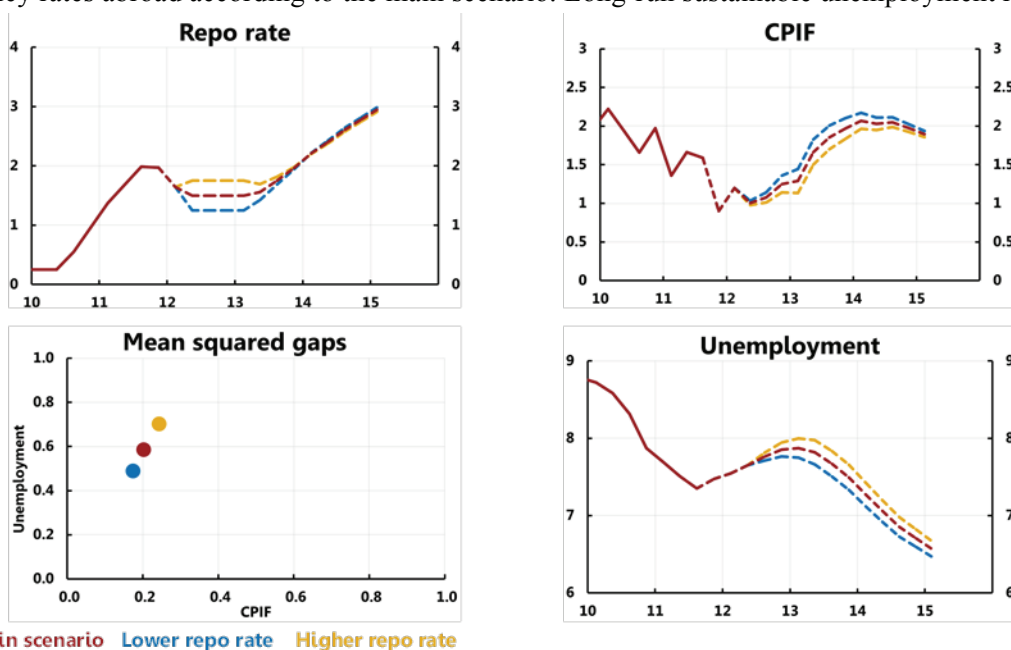
What is done at the Riksbank, and what I have brought to every policy meeting in recent years, are somewhat different four-panel graphs. One kind of four-panel graph shows the main-scenario policy-rate path and the corresponding main-scenario forecasts for inflation and unemployment, together with alternative policy-rate paths and the corresponding forecasts for inflation and unemployment. This exercise takes the assumptions and new information behind the main scenario as given and just examines whether, given that, alternative policy-rate paths would result in better or worse target achievement.

Another kind of four-panel graph deals with different assumptions than those in the main scenario about exogenous variables, such as a different forecast for foreign interest rates, the transmission mechanism, or private-sector expectations. The graphs can then show forecasts for inflation and unemployment for the main-scenario and alternative policy-rate paths under those alternative assumptions, in order to judge what policy-rate path makes forecasts of inflation and unemployment look good under those assumptions.

Figure 3, from the February 2012 minutes (Sveriges Riksbank 2012a), is an example of the first kind of four-panel graphs. The assumptions behind the main scenario and the resulting forecasts of CPIF inflation and unemployment are taken as given and the policy outcomes for a higher and lower policy-rate path are considered.¹⁷ The mean squared gaps show the mean squared deviations of inflation from the target of 2 percent and of the unemployment rate from an assumed LSRU of 6.5 percent. Smaller mean squared gaps hence imply better target achievement. We see that the lower policy-rate leads to better target achievement for both inflation and unemployment.

Figure 3. Monetary policy alternatives, February 2012

Policy rates abroad according to the main scenario. Long-run sustainable unemployment rate 6.5 per cent.



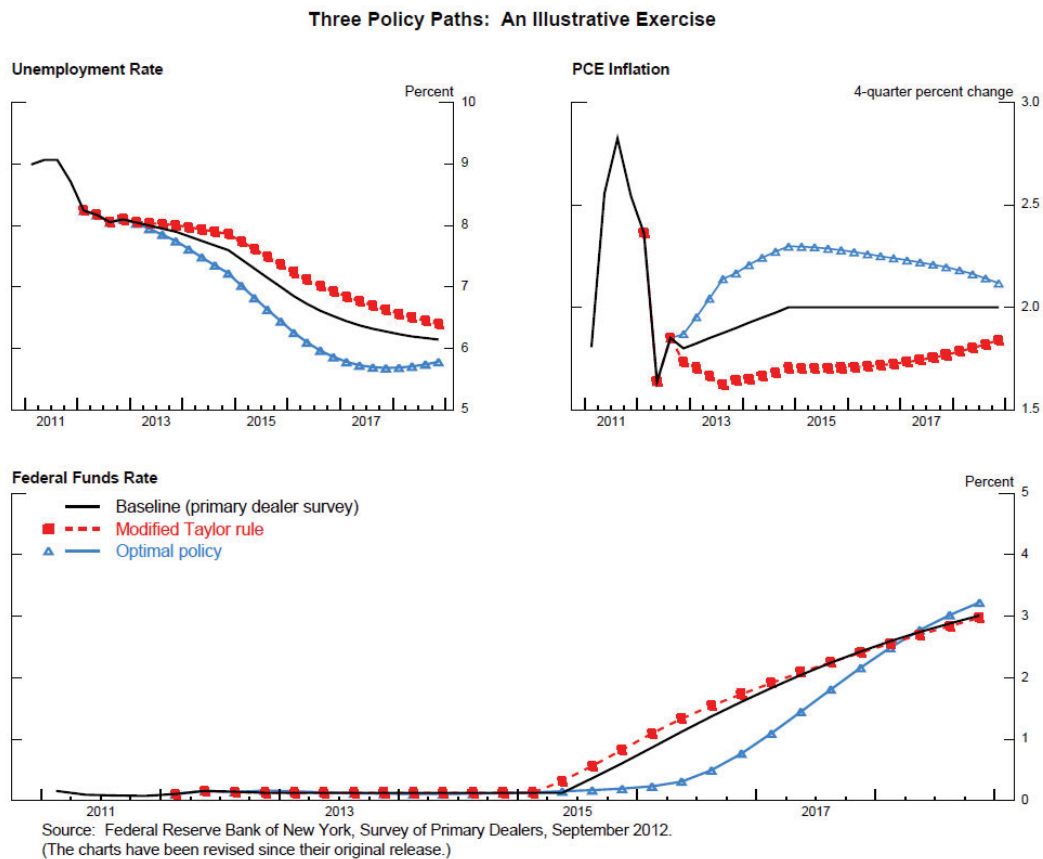
Sources: Statistics Sweden and the Riksbank. (Sveriges Riksbank 2012a, figure 4).

Similar graphs (without the mean squared gaps) have been used by Federal Reserve Board Vice Chair Yellen, for instance in Yellen (2012), reproduced here as figure 4. The three alternatives are a baseline

¹⁷ The CPIF inflation forecast instead of CPI inflation is included since there is a generally-accepted principle at the Riksbank that over the coming few years it is CPIF inflation that is relevant. The reason for this is that in the short term, CPI inflation is affected directly by the Riksbank's own policy-rate adjustments and monetary policy should not react to these temporary effects. If there is reason to believe that average CPIF and CPI inflation would differ in the longer run, due to a trend in the housing cost component of the CPI, this could be managed by monetary policy aiming for an average CPIF inflation rate that deviates from the target, so that average CPI inflation is in line with the target.

consistent with the New York Fed Primary Dealer Survey, September 2012, and FRB/US simulations with a modified Taylor rule and with optimal policy.¹⁸

Figure 4. Three policy paths: An illustrative Exercise



Source: Yellen (2012).

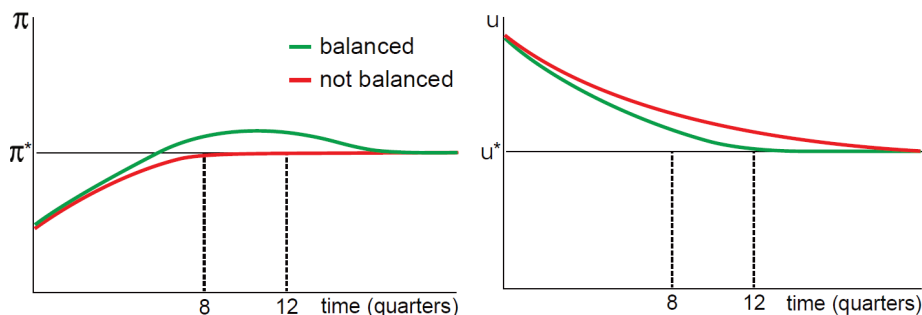
One point that follows from Yellen's graphs is that, in a situation when initially inflation is low and unemployment high relative to the target and an estimated LSRU, inflation may need to overshoot and exceed the inflation target for some time. This is a property of optimal policy emphasized by Deputy Governor Jan Qvigstad (2005) that at the Riksbank is called "Qvigstad's rule". When applied to inflation and the unemployment gap, it says that, normally, the inflation and unemployment gaps should have the same sign.

The same point is made by Federal Reserve Bank of Minneapolis President Narayana Kocherlakota (2013). In a graph (figure 5) he explains that a balanced approach in promoting the objectives of mitigating deviations of inflation from its longer-run goal and deviations of employment from the

¹⁸ As explained in Yellen (2012, footnote 17): "More precisely, the loss function that the central bank is assumed to minimize is the discounted sum of current and future squared deviations of inflation from 2 percent, current and future squared deviations of the unemployment rate from 6 percent, and current and future quarterly changes in the federal funds rate. The last term is included to avoid unrealistically large quarterly movements in the 'optimal' federal funds rate path."

Committee's assessment of its maximum level may in current circumstances require an overshooting of the inflation forecast.

Figure 5. Balanced and unbalanced approaches to monetary policy



Source: Kocherlakota (2013)

Of course, if average inflation over a longer period shall be close to the target, which according to the discussion in section 1 is what the phrase “without prejudice to price stability” must mean, the inflation target cannot be considered a ceiling but must be considered a midpoint target, in the sense that over time inflation must be as much and often above the target as below.

It follows that in the example of figure 3, target achievement would be better if inflation is allowed to overshoot the inflation target. It is indeed easy to see that a lower policy-rate path than the blue would lead to better target achievement.

A frequent counter-argument to the four-panel graphs (and indirectly to the above algorithm of forecast targeting) is that they do not give consideration to effects on the household debt ratio (the ratio of household debt to disposable income). For, example, Sveriges Riksbank (2013a, p. 34) states that “There is currently no simple way of taking considerations of this nature [that is, regarding debt] into account within the framework of the method [using four-panel graphs].” However, it is indeed quite possible to add to the graphs debt-ratio forecasts (or any other variable) for alternative policy-rate paths, using the impulse responses discussed in detail in Svensson (2013c) and shown in figure 2 above.

Thus, if the debt ratio is regarded as a target variable or as an intermediate target variable, it could be included in these graphs. An argument that has often been made in this context is that the debt ratio has an impact on the forecast of inflation and unemployment at a longer horizon, beyond the 3-year forecast horizon of the Riksbank. The idea is that a higher debt ratio would lead to a larger fall in aggregate demand in the future, due to more deleveraging in case of a fall in future housing prices. A higher debt ratio would then possibly shift down the (mean) inflation forecast and shift up the (mean) unemployment forecast farther into the future. If such considerations should have an impact on the current policy decision, it would seem desirable to try to quantify any such effect and extend the forecasts for inflation and unemployment farther into the future. The fact that the impact on the debt ratio of the policy rate is so small within a few years and that it according to existing research and conventional wisdom is zero in the longer run does, however, indicates that any changes in the mean forecast at a longer horizon would be very small. Furthermore, the result in Svensson (2013c) that an increase in the policy rate reduces the debt ratio rather than increases it makes the argument completely invalid.

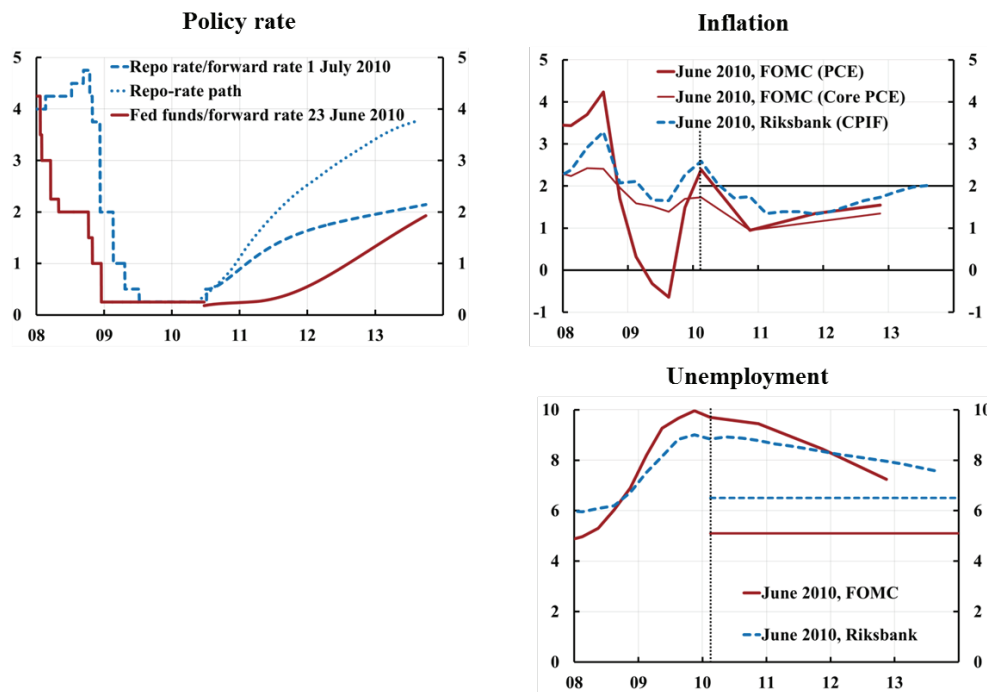
4 Evaluating monetary policy, ex ante and ex post

With clear objectives and enough information from the central bank, policy can be evaluated both ex ante, in real time, that is, considering only the information available at the time of the decision, and ex post, after the fact, that is, when information about what happened after the decision is available (see Svensson 2012c and Sveriges Riksbank 2013a).

4.1 Ex ante policy evaluation

Suppose that the central bank publishes the policy-rate path and the forecast of inflation and unemployment as well as estimates of how these forecasts shift when the policy-rate paths shifts. Then it is possible to evaluate policy in real time with the help of the four-panel graphs mentioned above and to judge whether a different policy-rate path would be better or not. Figure 3 above allow such an evaluation of the Riksbank's policy decisions in February 2012.

Figure 6. Policy rates, forward rates, and inflation and unemployment forecasts, FOMC and Riksbank, June 2010



Source: Svensson (2011b, figures 1-3).

In Svensson (2011b) I carry out such an ex ante evaluation and compare the decisions of the Fed and the Riksbank in June 2010. Figure 6 summarizes the relevant information. The top left panel shows the realized Federal funds rate and market expectations estimated from forward rates. It also shows the realized repo rate as well as market expectations and the Riksbank's repo-rate path. The top right panel shows the realized and forecasted PCE and core PCE inflation for the Fed and realized and forecasted CPIF inflation for the Riksbank. The bottom right panel shows realized and forecasted unemployment for the Fed and the Riksbank. We see that the inflation forecasts are similar, in that they are below the Riksbank's explicit and the Fed's assumed implicit target of 2 percent. Also, the unemployment forecasts are similar, in that they are above the Fed's and Riksbank's estimates of long-run sustainable rates (the horizontal red solid and blue dashed straight lines, respectively, on the bottom right panel). In this

situation, with similar forecasts, the two central banks took very different policy actions. The Fed kept their policy rate near zero and started to prepare for QE2, whereas the Riksbank started a period of rapid policy-rate increases. It is clear from these graphs that a lower policy-rate path for the Riksbank would bring better target achievement for both inflation and unemployment. If policy is evaluated according to ex ante target achievement for inflation and unemployment according the forecasts, it seems that the Fed did the right thing whereas the Riksbank did the wrong thing.

4.2 Ex post policy evaluation: Counter-factual policy experiments

Ex post, given information about how the economy evolved after the policy decision, it is possible to evaluate how appropriate monetary policy has been in the light of the actual outcome for the economy. In particular, it is possible to analyze what kind of policy would have been required to achieve a good target achievement. Such a so-called counterfactual analysis is quite possible to do, although the results have to be interpreted with some caution.

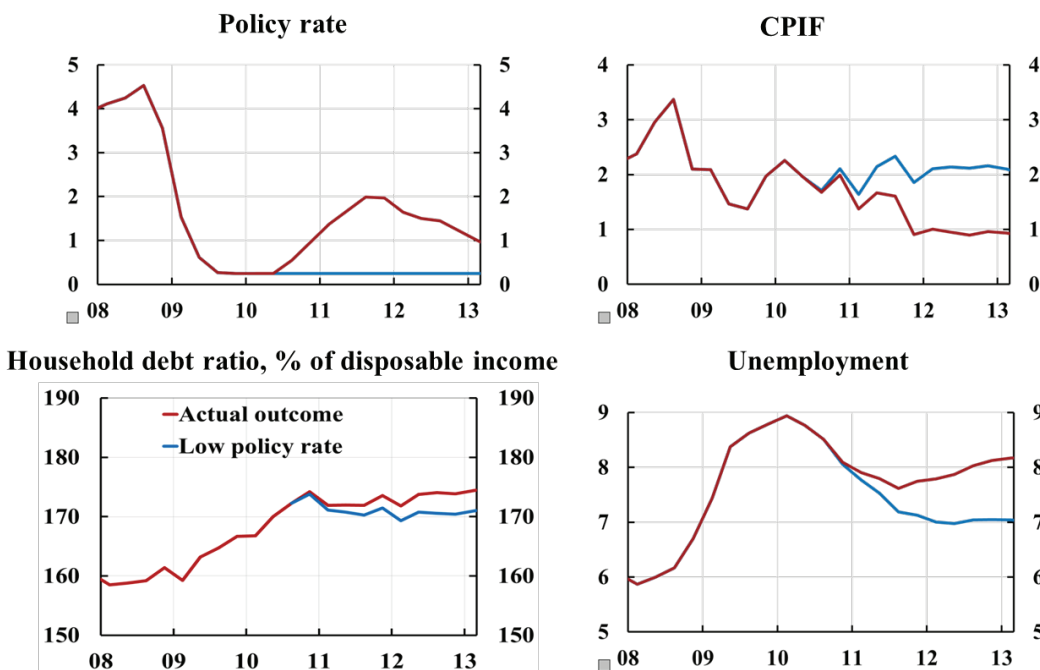
From and including the monetary policy meeting in June 2010, the majority on the Executive Board steadily raised the policy rate at every monetary policy meeting, from 0.25 per cent in June 2010 to 2 per cent in July 2011, an increase of 1.75 percentage points. As mentioned, Svensson (2011b) shows that these increases began despite the CPIF forecast in June 2010 being below the target and the unemployment forecast being well above a reasonable long-run sustainable rate (figure 6). Since December 2011, the majority on the Executive Board has lowered the policy rate to 1 per cent in December 2012, a cut of 1 percentage point. On average, the policy rate has been approximately 1.5 percentage points higher than if it had remained at 0.25 per cent until now.

One might ask what would have happened if the policy rate had remained at 0.25 per cent until now. This can be examined using the standard method to calculate the effects of alternative policy-rate paths in the four-panel figures.¹⁹ I report the results of one such preliminary calculation in Svensson (2013e) and in the minutes of the meeting in April 2013 (Sveriges Riksbank 2013c). Figure 7 shows a revision of that calculation, taking into account the insight in Svensson (2013c) that a higher policy rate increases rather than reduces the debt ratio. Such an analysis implies that CPIF inflation would have remained fairly stable at around 2 per cent instead of falling to 1 per cent and below. Target achievement for CPIF inflation would then have been as good as possible. Unemployment would have been lower and would in the first quarter of 2013 have been about 1.2 percentage points lower, at around 7 percent instead of at 8.2 percent. Target achievement for unemployment would have been much better than at present, irrespective of whether one compares with a long-run sustainable rate of unemployment of 5.5 (my own estimate) or 6.25 per cent (the midpoint of the Riksbank's recently estimated interval). These calculations are of course uncertain, but they provide a clear indication of the magnitudes we are talking about and allow an

¹⁹ The method calculates with the Riksbank's macroeconomic model Ramses the impact on inflation and unemployment of the anticipated or unanticipated shocks to the central bank's reaction function that result in a given alternative policy-rate path. It builds on Leeper and Zha (2003) and Laséen and Svensson (2011) and is discussed in general terms in Svensson (2010b). For figure 7 unanticipated shocks are used. See Laséen and Svensson (2011, appendix 4) for details when unanticipated shocks are used.

assessment of how much better the situation would have been if the Riksbank had not begun to increase the policy rate in the summer of 2010.²⁰

Figure 7. Policy rate, CPIF inflation, unemployment, and the debt ratio; actual outcome and low policy-rate path from 2010



Sources: Statistics Sweden, the Riksbank and own calculations. Sveriges Riksbank (2013e, figure 3, revised and taking into account that according to Svensson (2013c) a higher policy rate increases rather than reduces the debt ratio).

The conclusion of this counterfactual analysis is that the actual monetary policy conducted has led to much lower inflation and much higher unemployment than a policy that would have held the policy rate unchanged at 0.25 per cent. As mentioned, concerns about the debt ratio have been mentioned as a justification for the policy conducted. Therefore, one wants to examine what the consequences for the debt ratio would have been with the policy rate unchanged at 0.25 percent. This is shown in the bottom left panel, using the results on the response of the debt ratio mentioned earlier. The debt ratio would have been about 171 percent of disposable income instead of 174. This is a small reduction in the debt ratio and would arguably not tangibly affect any potential risks connected to household debt. But if one thinks that any risks vary with the debt ratio, since there is a reduction in the debt ratio, there would certainly not be any increase in the risks, if anything a reduction in the risks.²¹

²⁰ If this counterfactual experiment were to be repeated with a zero repo rate from June 2010 instead of a repo rate of 0.25 per cent, then CPIF inflation would be a couple of tenths higher and unemployment a few tenths lower. The counterfactual outcome would thus be even better.

²¹ The deviation of the counterfactual debt-ratio outcome from the actual debt-ratio outcome is constructed from the deviations of the counterfactual policy rate from the actual policy rate and the impulse response of the debt ratio to the policy rate. The impulse response of the debt ratio to the policy rate is assumed to be approximately the average of the impulse responses of total real debt and the debt-to-GDP ratio in figure 2. See Svensson (2013c) for details of how the impulse responses of total real debt and the debt-to-GDP ratio are calculated.

In summary, the policy tightening that the Riksbank undertook from the summer of 2010 has led to much lower inflation than the inflation target, much higher unemployment than a reasonable estimate of the long-run sustainable rate, and a somewhat higher debt ratio. The increase in the debt ratio is too small to have any tangible effect on any risks connected with household debt, but it has certainly not lead to any decrease in risks that might be worth the too high unemployment and too low inflation.

5 A downward-sloping long-run Phillips curve

The Riksbank's inflation target of 2 percent for annual CPI inflation was announced in January 1993 to apply from 1995. As discussed in Svensson (2013d), initially the inflation target was not credible, in that inflation expectations were much above 2 percent. Only towards the end of 1996 did the inflation target become credible, in that inflation expectations at one, two, and five years horizon became close to 2 percent. From 1997, inflation expectations measured by Prospera (now TNS Sifo Prospera) have been quite close to 2 percent and in that sense anchored to the target. However, average inflation has been significantly below 2 percent and equal to 1.4 percent during 1997-2011, the period examined in Svensson (2013d).

Sweden is actually an outlier in this context. Australia, Canada, and the U.K. have had inflation targets as long as Sweden, but in those countries average inflation has been quite close to the target during 1997-2011 (during 1997-2007 for the U.K.) as shown in Svensson (2013d, table 1), reproduced as table 1 here.

Table 1. Inflation target and average inflation for Australia, Canada, Sweden, and the U.K.; implicit inflation target and average inflation for the euro area and the U.S.

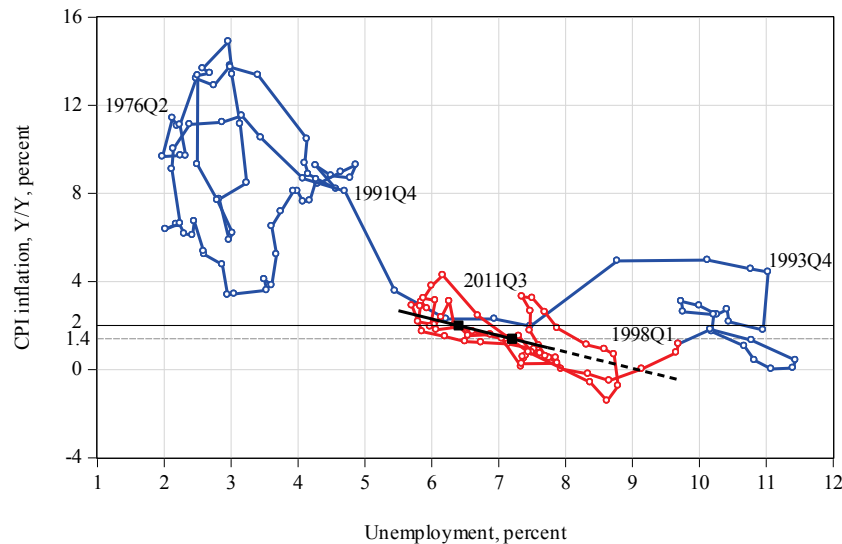
Country	Target	Index	Period	Average	Average less target
Australia	2–3	CPI	1997–2011	2.7	0.2
Canada	2	CPI	1997–2011	2.0	0.0
Sweden	2	CPI	1997-2011	1.4	–0.6
Sweden	2	CPI	1997-2007	1.3	–0.7
U.K.	2.5 (1992–2003)	RPIX	1997-2003	2.4	–0.1
	2 (2004–)	CPI	2004–2007	2.0	0.0
	2 (2004–)	CPI	2008–2011	3.4	1.4
Euro area	(< 2)	HICP	2000–2011	2.1	
U.S.	(≤ 2)	Core CPI	2000–2011	2.0	
	(≤ 2)	Core PCE	2000–2011	1.9	

Source: Reuters Ecowin and Statistics Sweden. Svensson (2013d, table 1).

In Sweden inflation expectations have been anchored at the inflation target even though average inflation has fallen significantly below the target. If inflation expectations are anchored at the inflation target but average inflation deviates from the target, the expectations-augmented Phillips curve for inflation and unemployment is no longer vertical but downward sloping. Svensson (2013d) estimates such a long-run Phillips curve for the period 1997-2011 and finds that a benchmark slope is 0.75, with a 95 percent confidence interval between 0.4 and 1.1. Figure 8 shows annual Swedish inflation and unemployment from 1976-2012, with the data from the period when inflation expectations have been anchored at the inflation target marked in red. The estimated long-run Phillips curve is shown as a solid black line for

average inflation deviations from the inflation target up to 1 percentage points and as a dashed line for deviations larger than 1 percentage points, to emphasize that the long-run Phillips curve, as discussed in Svensson (2013d), would not apply for very large deviations from the inflation target.

Figure 8. Unemployment and annual CPI inflation, 1976Q1-2012Q3, and the benchmark long-run Phillips curve, 1997-2011



Source: Svensson (2013d, figure 10).

So average inflation has been 0.6 percentage points below the inflation target during 1997-2011. This means that average unemployment has been $0.6/0.75 = 0.8$ percentage point higher than if average inflation had been equal to the target, corresponding to the horizontal distance between the two black squares in figure 8. The 95 percent confidence interval is between 0.55 and 1.5 percentage points.²² Thus, the average unemployment cost of average inflation falling below the inflation target during 1997-2011 is substantial.

The anchoring of inflation expectations to inflation targets and the consequence that Phillips curves then are not vertical but downward-sloping appears to be a global phenomenon. Fuhrer (2011) noticed that measures of inflation expectations in the U.S. had stabilized around a widely perceived implicit inflation target of 2 percent from around 2000. He estimated a downward-sloping but quite flat Phillips curve for the U.S. for 2000-2011. Svensson (2013d) confirms Fuhrer's estimates of the U.S. Phillips curve and also estimates a downward-sloping Canadian Phillips curve for 1997-2012. IMF's *World Economic Outlook* of April 2013 (IMF 2013, chapter 3) notices that inflation expectations have become more firmly anchored and Phillips curves have become quite flat in a number of economies.

I believe the policy implication from this is that it is important to keep average inflation over a longer period in line with the target, a kind of average inflation targeting (Nessén and Vestin 2005). To allow average inflation to undershoot the inflation target for long periods, as in Sweden 1997-2011 (and indeed up to today), has very large costs in terms of higher average unemployment. Fortunately, Sweden is an outlier, and in Australia, Canada, and the U.K., and more recently in the Euro area and the U.S., the

²² With the 95 percent confidence interval for γ , the slope of the Phillips curve, symmetric around 0.75 and equal to $[0.4, 1.1]$, the confidence interval for $0.6/\gamma$ is asymmetric around 0.8 and given by $[0.6/1.1, 0.6/0.4] = [0.55, 1.5]$.

central banks have kept average inflation very close to the (explicit or implicit) target (table 1). As discussed above in section 1, keeping average inflation on target is what the phrase “without prejudice to the price stability objective” must mean to be sensible.

The importance of keeping average inflation close to the target could be seen as an additional argument in favor of price-level targeting, with a price-level target rising at the rate of the inflation target. This would assert that average inflation is kept close to the target. On the other hand, in the economies other than Sweden just mentioned, the central banks have managed to keep average inflation on or close to the (explicit or implicit) target without an explicit price-level target.

Should the central bank try to exploit the downward-sloping long-run Phillips curve and secretly be more expansionary and try to keep average inflation a bit above the target, so as to induce lower average unemployment than for average inflation on target? My answer to that question is no. It would involve saying one thing (the target is 2 percent) and deliberately doing another (keeping average inflation above 2 percent). This would be cheating and inconsistent with an open and transparent monetary policy. Regardless of the moral quality of the policy, the truth might eventually be leaked or discovered, in which case the inflation target would lose credibility and inflation expectations rise above the target, in which case the possible benefit of inflation above target would vanish.

6 Monetary policy and financial policy

What are the lessons for practical inflation targeting from the global (more precisely, the North-Atlantic) financial crisis that started in the U.S. 2007 and affected Sweden in 2008-2009? The crisis affected Sweden through a dramatic fall in export, a foreign-currency liquidity problem for Swedish banks because of difficulties to borrow in foreign currency, and risks for Swedish banks of credit losses from loans in the recession-hit Baltic republics.

Is the financial crisis a reason to modify this framework of flexible inflation targeting? That depends on the causes of the crisis. As I see it, the financial crisis was caused by factors that had very little to do with monetary policy (Svensson 2011a). These factors were the *macro conditions*, global imbalances that led to low real interest rates and high asset prices and the Great Moderation that led to a systematic underestimation of risk and a substantial expansion of credit; *distorted incentives* in financial markets that led to extreme levels of leverage and risk-taking and a lack of due diligence; *regulatory and supervisory failures* that underestimated or disregarded the fragility of the financial sector; eventually enormous *information problems* with extremely complex asset-backed securities and huge hidden off-balance-sheet liabilities; and some very *specific circumstances*, such as the U.S. housing policy to support home ownership for low-income households and related sub-prime mortgages contributing to the U.S. housing boom. Importantly, none of these causes had anything to do with monetary policy, except indirectly in that monetary policy may have contributed to the Great Moderation (Bean 2009). Easy U.S. monetary policy did not cause the crisis and could not have prevented the U.S. housing boom (Bernanke 2010, Dokko, Doyle, Kiley, Kim, Sherlund, Sim, and Van den Heuvel 2009). As for Swedish monetary policy, it is obvious that it could not have prevented the Swedish banks from borrowing and lending in foreign currency or investing in the Baltic republics.

So what conclusions can we draw from this about the conduct of monetary policy and any need to modify the framework of flexible inflation targeting? One obvious conclusion is that price stability is not enough to achieve financial stability (White 2006).

Another conclusion is that interest-rate policy would not be enough to achieve financial stability. The policy rate is an ineffective instrument for influencing financial stability, and policy rates high enough to have a noticeable effect on credit growth and housing prices will have a strong negative effect on inflation and unemployment, even in sectors that are not experiencing any speculative activity. The use of the policy rate to prevent an unsustainable boom in housing prices and credit growth poses major problems for the timely identification of such an unsustainable development, as well as for the assessment of whether policy-rate adjustment would have any noticeable impact on the unsustainable development, and of whether, in the longer run, the outcome for inflation and unemployment would be better.²³

In particular, risks to financial stability are normally supposed to increase with the debt-to-GDP or debt-to-income ratios. As is shown in Svensson (2013c) and discussed above in section 2, a higher policy rate than a baseline actually *increases* the debt-to-GDP and debt-to-income ratios for a few years, since the denominator (nominal GDP or nominal disposable income) falls faster than the numerator (nominal debt). After a few years, the ratios then start falling slowly back towards the baseline and reaches the baseline in a decade or more. This means that “leaning against the wind” might, if anything, increase risks connected with the debt-to-GDP and debt-to-income ratios. In Sweden, as noticed above, tight monetary policy trying to restrain the household debt ratio has actually led not only to inflation considerably below the target and unemployment considerably above a long-run sustainable rate but also increased the debt ratios somewhat (although not as much as to materially affect any risks connected with the debt).

Thus, in regard to the financial crisis, it was financial policy (micro- and macroprudential policy) that failed, not monetary policy. Monetary policy in the form of flexible inflation targeting – applied in the right way and using all the information that is relevant for the forecast of inflation and unemployment, including the conduct of financial policy when appropriate – remains in my view the best-practice monetary policy before, during, and after the financial crisis.²⁴

6.1 Monetary policy and financial policy should not be confused

This leads me to the more general question of what the relation between monetary policy and financial policy should be. For instance, it is sometimes said that the objectives of monetary policy should be expanded to include financial stability (Eichengreen, Rajan, and Prasad 2011, and Eichengreen et al. 2011). Such suggestions give the impression that monetary policy and financial policy are the same thing. But they are not. It is important to conceptually distinguish financial policy from monetary policy and avoid conceptual and practical confusion between the two policies. Confusion risks leading to a poorer outcome for both policies. It also makes it more difficult to hold the policymakers accountable. Trying to use monetary policy to achieve financial stability leads to poorer outcomes for monetary policy and is an ineffective way to achieve and maintain financial stability.

²³ See Assenmacher-Wesche and Gerlach (2010), Bean (2009), Bean, Paustian, Penalver and Taylor (2010), Bernanke (2010), and Dokko, Doyle, Kiley, Kim, Sherlund, Sim, and Van den Heuvel (2009), IMF (2009), and Kohn (2008, 2009).

²⁴ There is some evidence that inflation-targeting served countries well during the financial crisis, see de Carvalho Filho (2011).

Different economic policies, such as fiscal policy, monetary policy, and labor-market policy, can be distinguished according to their objectives, the policy instruments that are suitable for achieving the objectives, and the authority or authorities that control the instruments and are responsible for achieving the objectives. From this point of view, it is clear that monetary policy and financial policy are distinct and different, and understanding this is important.

Monetary policy, in the form of flexible inflation targeting as specified above, has the objective of stabilizing both inflation around the inflation target and unemployment around an estimated long-run sustainable rate. Under normal circumstances, the suitable instruments are the policy rate and communication, including the publication of forecasts of inflation, unemployment, and (by some central banks) the policy rate. In times of crisis, as we have seen during the financial crisis, in particular when the policy rate is at or close to the zero lower bound, other more unconventional instruments can be used. These instruments include fixed-rate lending at longer maturities, asset purchases (quantitative easing) to affect longer interest rates and expectations of future short rates, and foreign-exchange intervention to prevent currency appreciation or even to induce currency depreciation. The authority responsible for monetary policy is typically the central bank. In many countries, including all the member states of the EU, the central bank is given exclusive authority over monetary policy by statute and various measures to protect this policy independence are put in place.

Financial policy has the objective of maintaining and promoting financial stability. Financial stability can be defined as a situation in which the financial system can fulfill its main functions of submitting payments, transforming saving into financing and providing risk management with sufficient resilience to disruptions that threaten these functions. The available instruments are, under normal circumstances, supervision, regulation, and financial stability reports with analyses and leading indicators that may provide early warnings of stability threats.

In times of crisis, authorities may use instruments such as lending of last resort, variable-rate lending at longer maturities (credit policy, credit easing), government lending guarantees, government capital injections, special resolution regimes for insolvent financial firms, and so forth. The responsible authorities vary across countries, but the powers are typically divided between several authorities. The lender of last resort function is with the central bank, but other instruments are often in the hands of other authorities.

So, financial policy and monetary policy are conceptually distinct, with distinct objectives and distinct suitable instruments. The decision frequency is also different. In monetary policy, decisions are often taken 6-8 times a year. In financial policy, decisions in normal times may be taken 1-2 times a year. Any financial cycle is normally considerably longer than the business cycle. When it comes to the instruments, the interest rate is a blunt and unsuitable instrument for affecting financial stability and it thus makes little sense to assign the objective of financial stability to *monetary policy*. However, it may make sense to assign the objective of financial stability to the *central bank*, if the central bank is given control of the appropriate supervisory, regulatory, and crisis-management instruments. Whether giving the central bank such a broad remit would also be the best solution is too complex an issue to address here.

In particular, arguably the most important aspect of financial stability is that the financial system has sufficient *resilience* to disturbances that threatens its main functions. This resilience requires sufficient supervision and regulation of capital requirements, leverage, liquidity coverage ratios, net stable funding

ratios, lending standards, risk taking, and so on. Clearly, monetary policy and the policy rate cannot systematically affect and ensure sufficient resilience of the financial system. Financial policy has to be used for that.

The fact that financial policy and monetary policy are distinct and different does not mean that there is no interaction between each policy and the other policy's objectives. Monetary policy affects the real economy and thereby profitability, asset prices, and balance sheets of the financial and non-financial sector. Thereby it indirectly affects financial stability. Financial policy directly affects spreads, lending, and other aspects of financial conditions as well as the transmission mechanism of monetary policy. This means that monetary policy should normally be conducted taking the conduct of financial policy into account, and financial policy should be conducted taking the conduct of monetary policy into account. This is similar to how monetary policy is conducted taking the conduct of fiscal policy into account, and vice versa. Note that this way of conducting monetary policy and financial policy – in line with a non-cooperative Nash equilibrium rather than a coordinated equilibrium – does not depend on how the authority for financial policy is shared between different institutions. It should be conducted this way regardless of whether the central bank has the sole authority or whether it is shared between several institutions.

Thus, under normal conditions, financial stability is handled by financial policy, not by monetary policy. In a second-best situation, without appropriate supervision and regulation, if the policy rate is the only available tool and there is a trade-off between its effect on the monetary-policy objectives and financial stability, that trade-off should be taken into account. Normally, however, the policy rate is not the only available tool, and much better instruments are available for affecting financial stability. Certainly this is the case in Sweden where, as mentioned above, the Finansinspektionen (the Swedish Financial Supervisory Authority) and the Government have taken or announced several effective measures, namely the mortgage loan-to-value cap, higher capital-adequacy requirements for systemically-important banks, and higher risk weights on mortgages. Monetary policy should be the last line of defense of financial stability, not the first line.²⁵

6.2 A “Modified Jackson Hole Consensus” versus “Leaning Against the Wind Vindicated” for Sweden?

Smets (2013) provides a thorough discussion of the relation between financial policy and monetary policy and an extensive overview of the relevant literature. In particular, he identifies three different views about the interaction of the two policies and corresponding conceptual framework. The first is what he calls a

²⁵ Woodford (2012) sets up a model where the probability of a financial crisis is assumed to be an increasing function of a state-variable that may be identified with leverage. Furthermore, leverage is assumed to be increasing in lagged leverage and the current output gap and is also subject to shocks. From these assumptions obviously follow a case for tighter monetary policy, “leaning against the wind,” in order to, everything else equal, reduce the output gap and thereby leverage and the probability of a financial crisis. However, as noted in Svensson (2012a), the introduction in Woodford's model of financial instruments such as capital requirements, possibly cyclical ones, would allow leverage to be controlled more directly than indirectly and bluntly by the policy rate via the output gap. Monetary policy would be free to focus on stabilizing inflation and the output gap and need not lean against the wind. In the realistic case when the state variable affecting the probability of a financial crisis is a vector that includes not only leverage but, for instance, maturity mismatch and liquidity mismatch, it is even more the case that additional financial instruments such as restrictions on maturity and liquidity mismatches are superior to the policy rate in achieving and maintaining financial stability.

“Modified Jackson Hole Consensus”, the second “Leaning Against the Wind Vindicated.”²⁶ The views I have expressed above and argue are relevant for the Swedish economy are firmly within the Modified Jackson Hole Consensus.

The second view, Leaning Against the Wind Vindicated, argues that monetary policy should take financial-stability objectives into account, that is, that financial stability should be added to the monetary policy objectives and monetary policy should be set with also financial-stability objectives in mind. As summarized by Smets (2013):

[The view] acknowledges that there is a financial cycle that cannot be fully addressed by macroprudential policy and interacts with the business cycle in various potentially non-linear ways. It also acknowledges that the monetary policy stance may affect risk-taking by the financial intermediation sector and, conversely, that the fragility of the intermediation sector affects the transmission process and the outlook for price stability. In this view, financial stability concerns should be part of the secondary objectives in the monetary policy strategy. The inclusion of secondary financial stability objectives naturally leads to a lengthening of the policy horizon of the monetary authorities as the financial cycle is typically longer than the business cycle. It suggest a modification of flexible inflation targeting whereby financial stability concerns are taken into account in deciding on the optimal adjustment path for inflation, introducing a term which resembles “leaning against the wind”.

The second view considers that financial policy and macroprudential tools are ineffective in managing the financial cycle and reducing the risk of a financial crisis, that monetary policy can complement financial policy in reducing the risk of a financial crisis, and that flexible inflation targeting may itself be a source of growing financial imbalances and increasing risks. Therefore, it is appropriate to take the financial stability implications of monetary policy into account and adjust monetary policy so as to reduce the risks of a financial crisis.

Are financial policy and macroprudential instruments ineffective in Sweden?

Starting from Smets (2013), I here consider whether the second view is relevant for the Swedish economy. A first crucial issue is whether financial policy and macroprudential instruments are ineffective in maintaining financial stability and reducing risks of a financial crisis in Sweden. Here it is important to consider some characteristics of the Swedish financial system. Importantly, it is dominated by four commercial banks in an oligopoly. There is no investment-banking sector to speak of. This makes supervision and regulation simpler compared to other countries with more complex financial sectors and considerable regulation arbitrage. The four commercial banks have a history of supplying detailed information about assets, liabilities, realized and anticipated cash-flow, etc. to the Finansinspektionen and the Riksbank. This makes it relatively easy to monitor leverage, lending, credit growth, lending standards, etc. It also makes it easy to assign targeted macroprudential instruments if needed.

²⁶ The third view discussed by Smets (2013), “Financial Stability is Price Stability,” is due to Brunnermeier and Sannikov (2013) and argues that fiscal, monetary, and financial policy are closely intertwined due to financial frictions. The close connection between monetary and financial policy comes from the fact that the health of the financial-intermediation sector determines the degree of inside money creation and the price of risk in the economy. Monetary policy works by distributing wealth between sectors of the economy. This view is not furthered discussed here.

As Goodhart (2012) notes, a lack of competition brings “cosy profits”, less risk-taking, and stability:

One of the main reasons why the financial system was so stable between the 1930s and the 1970s was that competition was ruthlessly suppressed. It is the “challenger banks”, the fringe banks, Northern Rock, the Icelandic banks, Anglo-Irish, the middle-sized banks, beloved of Andy Haldane (executive director for financial stability at the Bank of England), struggling to get larger, that drive the financial system so often to disaster. The countries with the most stable outcomes in the recent crisis were those with the most oligopolistic, protected from foreign competition, domestic banking markets: Australia, much of Asia, Canada, etc. There is nothing like access to cosy profits to make managers risk averse. If British society really wants structural financial stability above all else, it should ban all foreign banks from the country and re-establish the London Clearing Bank cartel that held sway before 'Competition and Credit Control' in 1971. That would be a safe structure.”

Goodhart should have added “Sweden” after “Canada.” The point is that the oligopoly brings stability, although at the cost of competition and efficiency. Indeed, given the lack of competition, Swedish banks seem to be able to make profits in all circumstances, including during the current recession.

On the efficiency of macroprudential measures in Sweden, I have already noted in the discussion in section 1.1 above of claim (3), that in Sweden the Finansinspektionen and the Government have taken or announced several effective measures to mitigate any possible risks associated with household debt namely the mortgage loan-to-value cap (which has a clear effect on the loan-to-value for new mortgages according to Finansinspektionen's Swedish Mortgage Market Reports in 2012 and 2013), higher capital-adequacy requirements for systemically-important banks, and higher risk weights on mortgages. The Finansinspektionen in its Mortgage Market Reports also thoroughly monitors that mortgage lending standards are strict, that borrowers' debt-service capacity is good, and that borrowers' resilience to disturbances in form of increased mortgage rates, unemployment, and housing price falls is sufficient.

According to the most recent *Financial Stability Report* (Sveriges Riksbank 2013b), the four banks satisfy Finansinspektionen's regulations that they should have a liquidity coverage ratio of at least 100 per cent, totally and separately for euro and US dollar. The requirement is based on the Basel Committee's LCR proposal from December 2010 and thus does not correspond to the less strict Basel Committee's revised LCR from 2013. The banks report Basel-III net stable funding ratios not far from 100 percent. They have fulfilled the Finansinspektionen's previous recommendation to have a Basel-III CET 1 capital ratio of at least 10 percent by January 1 this year. The Finansinspektionen has also issued a recommendation to have CET 1 capital ratio of at least 12 percent as of January 2015. This recommendation is already fulfilled as of March 2013 by three of the banks, the fourth has a capital ratio of 11.9 percent.

Thus, it is difficult to say that macro prudential instruments have been ineffective in Sweden. If there is a need, nothing prevents the Finansinspektionen and the Government from introducing new instruments, such as caps on debt-to-income or debt-service-to-income ratios, or modifying property taxes or mortgage-tax-deduction rules.

This is even more the case, as mentioned above in section 2, after the Swedish government announcement of August 2013 (Swedish Government 2013b) of a new strengthened framework for financial stability in Sweden. Sweden should now have an effective framework for financial policy and financial stability, with the main responsibility for financial stability and the control of the micro- and macroprudential

instruments assigned to the Finansinspektionen. This framework is consistent with monetary policy and financial policy being separate policies with separate objectives, instruments, and responsible authorities.

Do monetary policy and the policy rate have a significant impact on financial stability in Sweden?

Another crucial issue is whether monetary policy and the policy rate have a significant impact on financial stability and risks of future financial crises. What risks to financial stability does the most recent *Financial Stability Report* (Sveriges Riksbank 2013b) identify?

In its summary, the report (p. 7) states that

At present, the major Swedish banks are financially strong. The major Swedish banks' (Handelsbanken, Nordea, SEB and Swedbank) earnings have increased and their loan losses have been small. They have also continually increased their short-term liquidity and capital in accordance with the Riksbank's recommendations and are still well-capitalised, compared with many other European banks. As a result, they have good access to market funding in both Swedish kronor and foreign currencies. The Riksbank's assessment is therefore that the major Swedish banks are financially strong at present.

Developments in the euro area constitute the largest risk to financial stability. However, it is expected that the Swedish economy will continue to be affected by weak economic development in the euro area. A long recession in the euro area accompanied by unease on the financial markets may lead to an increase in loan losses for the major Swedish banks and to a decline in their earnings. Moreover, the banks may experience greater difficulty in obtaining access to market funding. Swedish housing prices may also fall if Sweden is hit by a prolonged economic slowdown. The high level of household debt could then lead to a decline in consumption, which could have a negative impact on growth, as well as macroeconomic and financial stability. Companies could then experience problems with paying their day-to-day expenses, which risks leading to increased loan losses for the banks. However, the Riksbank's stress tests show that the major Swedish banks have strong resilience to increased loan losses.

The banks need more resilience in the long run. There are vulnerabilities in the structure of the Swedish banking system that could have a negative effect on financial stability in the longer run. For example, the banking system is large in relation to the Swedish economy and strongly interlinked, which means that a financial crisis could also require government intervention and thus become costly for taxpayers. The banks therefore need more resilience in the long run. The Riksbank recommends that the major banks continue to reduce their structural liquidity risks and ensure that they have enough capital to cope with potential future losses and disruptions on the financial markets. The Riksbank also recommends that the major banks improve their public liquidity reporting by providing an account of their structural liquidity risks in accordance with the definition in the Basel III Accord.

Thus, according to the second paragraph of the summary, developments in the euro area constitute the largest risk to financial stability. Those developments are clearly not something that Swedish monetary policy can affect.

The third paragraph emphasizes that Swedish banks need more resilience in the long run, mainly because of their size relative to the economy and their interlinkage. Obviously, monetary policy cannot do anything about the size or interlinkage of the Swedish banks.

However, the second paragraph identifies the risks associated with household debt. It relies on a particular chain of events and states that Swedish housing prices could fall if Sweden is hit by a prolonged economic slowdown and that the high level of household debt could then lead to a decline in consumption, which could have a negative impact of Swedish firms' cash-flow. This in turn could lead to credit losses for the banks that have lent to these firms. On the other hand, the summary states that "Swedish banks have strong resilience to increased loan losses." In the end, it is hardly clear how large risks to financial stability the household debt entails.

Importantly, the risks are not in the form of direct credit losses on mortgages for the banks. The view accepted by both the Finansinspektionen and the Riksbank is that credit losses on mortgages are very unlikely, since borrowers have good debt-service capacity and have good resilience against disturbances in the form of higher mortgage rates, income losses because of increased unemployment, and falls in housing prices. Swedish mortgages are full recourse, and even during the deep Swedish financial and banking crisis in the 1990s, mortgages caused a small part of credit losses.²⁷ Instead, the risks are quite indirect. The idea is that a prolonged economic downturn may lead to a fall in housing prices which in turn results in indebted households' deleveraging and reducing their consumption, which then would then further reduce domestic aggregate demand, cause losses among domestic firms, and finally cause credit losses in banks that have lent to the firms.

The role of monetary policy in mitigating this chain of events is not quite obvious. Above we have already found that monetary policy has only very small effects on housing prices and the household debt ratio within a couple of years and no effect in the long run. In particular, tighter monetary policy *increases* the real debt and the debt-to-GDP and debt-to-income ratios. The main role of monetary policy would instead seem to be to mitigate with easy policy the consequences for the Swedish economy and Swedish export of a fall in demand from the euro area and any resulting fall in domestic aggregate demand, including consumption. A weak krona would help mitigating the effect on exporting firms, and a sizable proportion of variable-rate mortgages would help mitigating the effect on domestic consumption by borrowers. However, the initial high unemployment due to previous tight monetary policy makes the Swedish economy more vulnerable to disturbances from the euro area than if unemployment were closer to its long-run sustainable rate.

Overall, it is difficult to see that tighter policy would make the Swedish economy more resilient to shocks from the euro area.

What would be the consequences of a fall in housing prices?

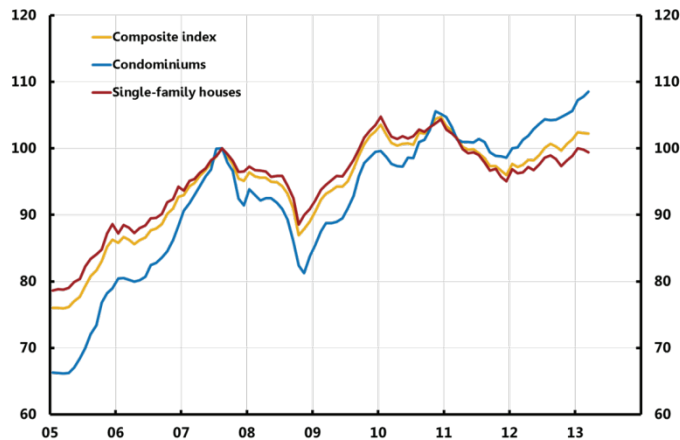
Furthermore, the particular chain of events can be questioned. During the 2008-2009 crisis, Swedish real housing prices fell from the fall of 2007 to the fall of 2008 by more than 10 percent for single-family houses and almost 20 percent for condominiums (figure 11). Housing prices have since recovered and are now on average at about the same level as in the fall of 2007. During the crisis, when export and

²⁷ The household sector caused only about 6 percent of the credit losses of the four big banking groups when the banking crises peaked in 1992 (Sveriges Riksbank 1998, p. 15-16).

investment collapsed, Swedish consumption held up pretty well and mitigated the impact on the economy. This is a real-time stress test of the effect of a housing price fall on consumption. I believe real-time stress tests should carry more weight than stress tests on paper.

Figure 11. Real prices for single-family houses and condominiums

Index, August 2007 = 100, seasonally adjusted data



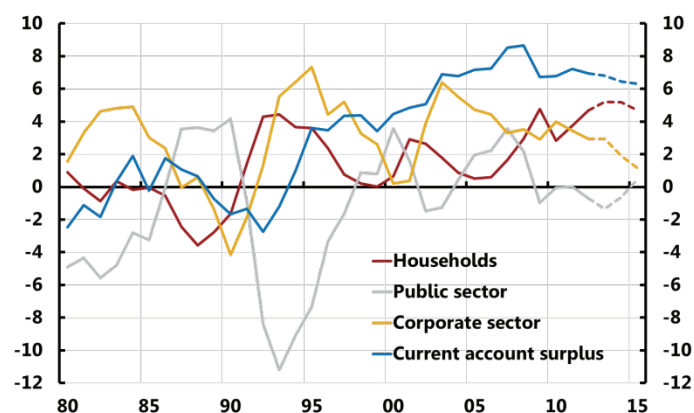
Source: Statistics Sweden and the Riksbank.

The idea that a housing-price fall would lead to substantial deleveraging and a substantial fall in consumption can be questioned. Swedish households' saving as a share of disposable income is already very high. Household's total saving as a share of GDP is about 5 percent, higher than it was during the crisis in the 1990s (figure 12). Swedish households have strong balance sheets, with assets (excluding the collective pensions) that are three times their debt, and their saving excluding collective pensions as a share of disposable income is historically high (figure 13). Their net worth to total assets is thus about 67 percent, equal to the strongest Swedish companies and much larger than the 3 percent of the commercial banks (figure 14). Swedish household's loan-to-value is at about 55 percent, having trended down from about 70 percent since the late 1980s. There is no evidence that a low policy rate leads to a high loan-to-value ratio (figure 15). The households' largest asset is of course their earnings capacity, their human capital. For a household that will be working for the next 20 years, the present value of its disposable income is about 18 times its current disposable income, that is, more than 10 times the debt.²⁸ Many young households will work for considerably longer. As much as 60 percent of the debt is held by the 20 percent of the households that have the highest disposable incomes (Javeus 2012). Of course, these high-income households generally have good education and good jobs with high job-security or good job alternatives.

²⁸ The present value calculated assuming a nominal interest rate after tax of 5 percent (7 percent before tax) and 4 percent growth per year of nominal income (2 percent real growth and 2 percent inflation).

Figure 12. Financial surplus for different sectors

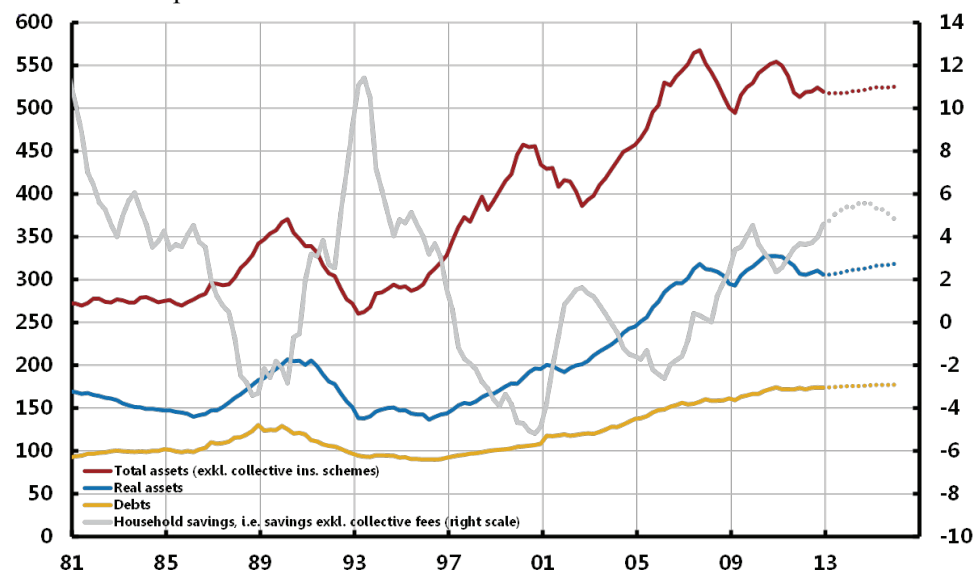
Percent of GDP



Source: Statistics Sweden and the Riksbank.

Figure 13. Household total wealth, real assets, debt, and saving

Percent of disposable income

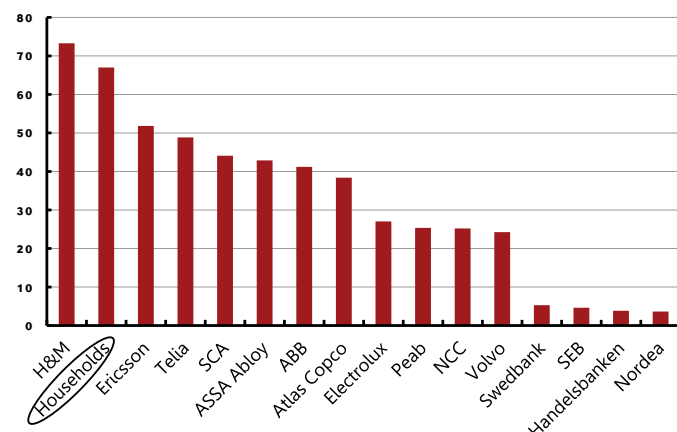


Note: Collective pensions (excluded in the figure) are about 120 percent of disposable income.

Source: Statistics Sweden and the Riksbank.

Figure 14. Net worth to total assets (the leverage ratio) of Swedish households, some large listed companies, and Swedish banks

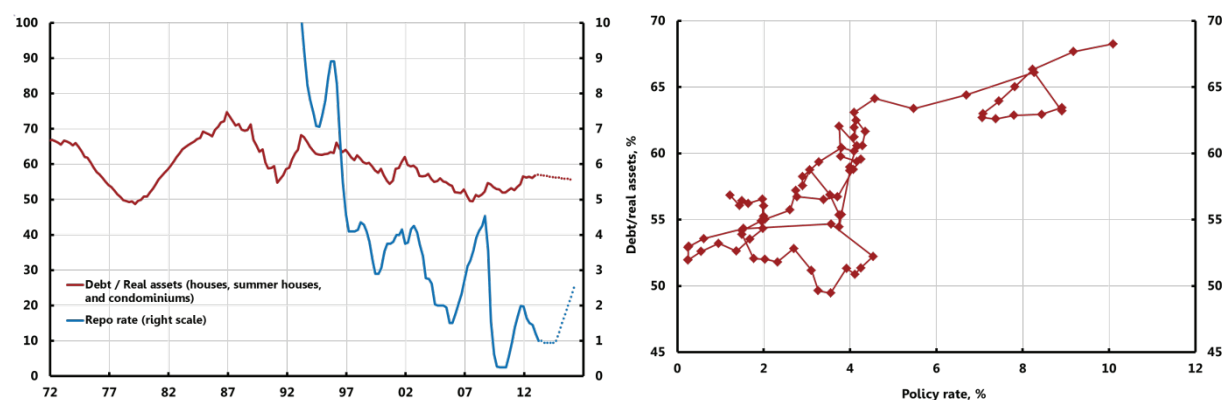
Percent



Source: Dagens Industri (leverage ratio 2011 for listed companies and Swedish banks) and the Riksbank (household leverage ratio).

Figure 15. The household loan-to-value ratio and the repo rate

Percent



Source: The Riksbank.

The consequences for the Swedish economy of fall in housing prices are examined by Claussen, Jonsson, and Lagerwall (2011), part of the Riksbank's *Inquiry into the Risks in the Swedish Housing Market*. They show that the macroeconomic effects of a 20 per cent fall in housing prices would be relatively limited and possible to counteract by adopting a more expansionary monetary policy. This is shown in more detail in the minutes of the monetary policy meeting held in June 2010 (Sveriges Riksbank 2010), when I presented simulations showing how expansionary monetary policy can stabilize CPIF inflation and GDP growth quite effectively following such a fall in housing prices, also taking into account the zero lower bound for the policy rate.

Overall, it seems that the Riksbank analysis and view of the chain of events is hardly satisfactory. In particular, there is no explicit analysis of under what circumstances housing prices would fall and what a possible scenario for that is.

The risk-taking channel in Sweden

Another crucial issue in *Leaning Against the Wind Vindicated* is the role of the so-called risk-taking channel, the idea that a low policy rate leads to more risk-taking and possibly excess risk-taking in the financial sector (Adrian and Shin 2011, Apel and Claussen 2012).

The arguments that low interest rates lead to more risk-taking usually refer to highly leveraged financial intermediaries, broker-dealers in the investment-banking sector (Adrian and Shin 2011). However, as mentioned, the Swedish financial sector is dominated by an oligopoly of four commercial banks, and there is no investment-banking sector to speak of. I am not aware of any evidence that these Swedish commercial banks tend to increase their leverage and risk-taking or lower lending standards when the policy rate is low.²⁹ Given the lack of competition, they can make cozy profits regardless of what the policy rate is.³⁰

Possible consequences of low interest rates mentioned in the debate include ever-greening of non-performing loans and the survival of zombie firms and zombie banks, or reduced incentives of balance-sheet repair by firms of banks. I don't know of any evidence that such phenomena are relevant for Sweden.

Furthermore, the general discussion about policy rates, the risk taking channel, and so on, and the existing models, seem to suffer from confusion between nominal policy rates and the general level of real interest rates. Models such as those of Adrian and Shin (2011) and Diamond and Rajan (2011) include a short real rate but no nominal policy rate and no explicit monetary policy.³¹ Nor do they distinguish between the short real rate and the neutral real rate (also called the natural real rate). All that monetary policy can do by setting a short nominal policy rate is to temporarily make the short real rate deviate from the neutral real rate, which itself is beyond the control of monetary policy. The effects attributed to monetary policy should be the effects of that difference, not the level of the neutral rate or the overall level of the real rate. The neutral real rate is affected by many things and can remain low for many years for several reasons, including global imbalances, fiscal policy, and shocks to aggregate demand and supply. Since the mid-1990s, there has been a global downward trend in real interest rates. This is not anything monetary policy can affect.

7 Conclusions

In summary, my lessons from my six years of practical inflation targeting as a policy maker at the Riksbank are the following: First, be clear about and do not deviate from the mandate for flexible inflation

²⁹ Plots of commercial banks' leverage against the policy rate show no systematic relation between leverage and the policy rate.

³⁰ Furthermore, even if lower policy rates did lead to more risk taking, it does not follow that the resulting amount of risk taking would be too much. That depends on what the optimal level of risk taking is. In the wake of the financial crisis, it might be that risk aversion and the perception of uncertainty are exceptionally high and that there is overall too little risk taking. Without further analysis, this cannot be known. The optimal adjustment of risk when real rates of return fall depends on the precise preferences for expected real rates of return and risk, as is revealed by the simplest mean-variance analysis when the investment line is shifted down (Apel and Claussen 2012). "Search for yield" regardless of the risk is difficult to understand in such mean-variance analysis, other than as the result of an unfortunate and ill-conceived unconditional promise of a particular rate of return, which regulators should prohibit.

³¹ Adrian and Shin (2011) and Diamond and Rajan (2011) also do not contain the frictions, such as sticky prices, that allow meaningful modeling of the effects of monetary policy.

targeting – price stability and the highest sustainable unemployment. This means stabilizing inflation around the inflation target and unemployment around a long-run sustainable unemployment rate. To avoid any prejudice to the objective of price stability, keep average inflation over a longer period on target, as other inflation-targeting central banks successfully have done.

Second, do not include household debt as an additional target variable besides inflation and unemployment. Especially since “leaning against the wind” actually *increases* rather than reduces the household debt-to-GDP and household debt-to-disposable income ratios (Svensson 2013c). Leave any problems with household debt to the Finansinspektionen (the Swedish Financial Supervisory Authority) and its micro- and macroprudential instruments. Especially since the Swedish government in August 2013 (Swedish Government 2013b) announced a new strengthened framework for financial stability in Sweden, where the Finansinspektionen is assigned the main responsibility for financial stability and the control of all the micro- and macroprudential instruments.

Third, use a two-step algorithm to implement “forecast targeting”. In step 1, examine the effects on the forecasts for inflation and unemployment of new information and assessments for an unchanged policy-rate path, the policy-rate path from the previous policy decision. In step 2, adjust the policy rate and the policy-rate path so the forecasts for inflation and unemployment “look good,” that is, best stabilize inflation around the inflation target and unemployment around an estimated long-run sustainable rate. Use four-panel graphs to summarize these steps, where the four panels include the policy rate-path, the inflation forecast, the unemployment forecast, and the mean squared gaps (the mean squared deviations of inflation from the target and of unemployment from the estimated long-run sustainable rate).

Fourth, use four-panel graphs as one element in evaluating monetary policy *ex ante*, that is, in real time, meaning taking into account only the information available at the time of the decision. Use counterfactual experiments as one element in such evaluations *ex post*, that is, after the fact, meaning taking into account also information available after the policy decision.

Fifth, with a credible inflation target and anchored inflation expectations, the long-run Phillips curve is no longer vertical. Then, keep average inflation over a longer period on the target. Especially, do not let average inflation fall below the target, since this will cause average unemployment to be unnecessarily high.

Sixth, as far as I can see, flexible inflation targeting remains the best-practice monetary policy, before, during, and after the recent financial crisis. It was not monetary policy that failed before the crisis; it was supervisory and regulatory policies, that is, financial policy, that failed. Do not confuse monetary policy and financial policy. Use monetary policy and the monetary-policy instruments to achieve the monetary-policy objectives (price stability and highest sustainable employment) and financial policy (micro- and macroprudential policy) and the financial-policy instruments to maintain financial stability. Conduct each policy separately, taking into account the conduct of the other policy, as with monetary policy and fiscal policy. Between the alternatives of the Modified Jackson Hole Consensus and Leaning Against the Wind Vindicated (in the terminology of Smets 2013), the former is the relevant one for Sweden. The new strengthened framework for financial stability in Sweden, assigning the main responsibility for financial stability and the control of the micro- and macroprudential tools to the Finansinspektionen, is in line with this.

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