

Fourteen Years of Inflation Targeting in South Africa and the Challenge of a Changing Mandate

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Contents

Foreword <i>Lesetja Kganyago</i>	v
The contributors.....	vii
Introduction <i>Conference Organising Committee</i>	xiii
Keynote address: Inflation targeting in emerging markets: the global experience <i>John B Taylor</i>	1
Inflation targeting and leaning against the wind <i>Lars E O Svensson</i>	19
Emerging economies: developments and challenges <i>Vivek Arora</i>	37
Targeting core inflation in emerging-market economies <i>Stan du Plessis</i>	53
Monetary policy and heterogeneous inflation expectations in South Africa <i>Alain Kabundi, Eric Schaling and Modeste Some</i>	69
Inflation targeting and the global financial crisis: successes and challenges <i>John C Williams</i>	95
Labour market and monetary policy in South Africa <i>Vincent Dadam and Nicola Viegi</i>	113
Speculative flows, exchange-rate volatility and monetary policy: the South African experience <i>Shakill Hassan</i>	139
Abbreviations.....	170

Inflation targeting and leaning against the wind

Lars E O Svensson*

Abstract

Should inflation targeting involve some leaning against the wind? Leaning against the wind – a tighter monetary policy than is justified for stabilising inflation around an inflation target and resource utilisation around a long-run sustainable rate – has been advocated as a policy to counter rapid credit growth and rising asset prices. Sweden provides a case study, as the Riksbank has been leaning against the wind quite aggressively since 2010, stating concerns about risks associated with household indebtedness. The cost of this policy is high, in the form of inflation much below the target and a higher unemployment rate, arguably as much as 1,2 percentage points higher than necessary. In contrast, according to the Riksbank's own calculations, the benefit of a higher policy rate in terms of a lower probability and less severity of a future crisis is miniscule. Expressed in the form of a lower expected future unemployment rate, the benefit is only about 0,004 of the cost in the form of a higher unemployment rate over the next few years. Furthermore, much lower inflation than expected has actually substantially increased households' debt burden and, if anything, increased any risks. Since the fall of 2011, the real value of a given loan has become almost 6 per cent larger than if inflation had been on target.

JEL codes: E52, E58, G21.

1. Flexible inflation targeting

Let me start from standard flexible inflation targeting, according to which monetary policy aims at stabilising inflation around the inflation target and resource utilisation around a long-run sustainable rate. Furthermore, let me for concreteness assume that the unemployment rate is a satisfactory measure of resource utilisation, so stabilising resource utilisation means stabilising unemployment around an estimated long-run sustainable rate.

A main current question is: should standard flexible inflation targeting be combined with some degree of 'leaning against the wind'?

* Presented at the Conference on Fourteen Years of Inflation Targeting in South Africa and the Challenge of a Changing Mandate, South African Reserve Bank, Pretoria, 30–31 October 2014. A previous version of this paper was presented under the working title 'Inflation targeting and leaning against the wind: a case study' at the National Bureau of Economic Research (NBER) 25th Annual East Asian Seminar on Economics, Unconventional Monetary Policy, held in Tokyo from 20 to 21 June. A shorter version has been published under the title 'Inflation targeting and leaning against the wind' by the *International Journal of Central Banking*, June 2012, pp 103–114.

2. Leaning against the wind

Leaning against the wind implies a bias towards a somewhat tighter policy than justified by stabilising inflation and unemployment in order to avoid financial ‘imbalances’ and threats to financial stability (Bank for International Settlements 2014). As discussed by Smets (2013), it presumes that (1) macroprudential instruments or polices are ineffective, and that (2) a higher policy rate has a significant negative impact on threats to financial stability.

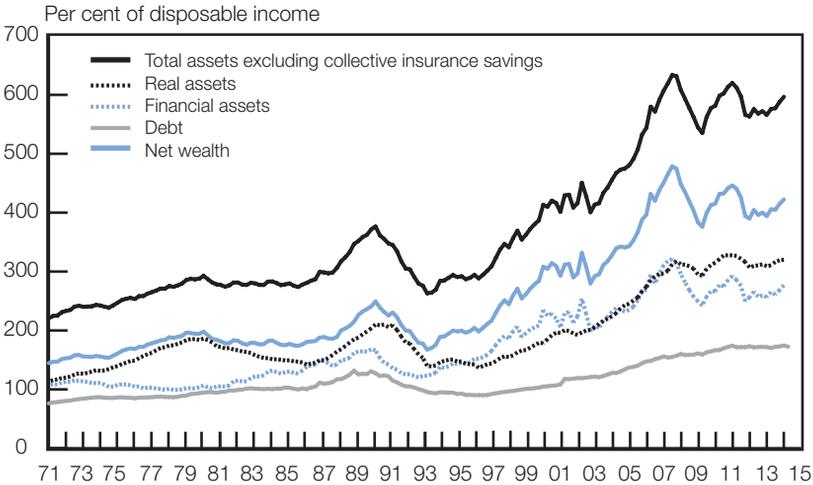
My view is that presumption (1) varies much from country to country, and that presumption (2) has little theoretical and empirical support, although the latter may depend on the structure of the financial sector, whether it is competitive or oligopolistic, the relative importance of shadow banking, and so on. This means that it is difficult to generalise from one country to another. Each country and economy needs to be scrutinised before one can judge whether there is a case for leaning against the wind or not.

3. Case study: Leaning against the wind in Sweden

I will use the monetary policy and macroprudential policy in Sweden over the past few years as a case study. Regarding monetary policy, the Riksbank has been leaning against the wind quite aggressively since the summer of 2010, stating concerns about risks associated with household indebtedness as measured by the household debt-to-income (DTI) ratio. This has led to inflation much below the target and unemployment much above any reasonable long-run sustainable rate.

Figure 1 shows how Swedish households’ aggregate assets, debt and net wealth have developed since 1971. Since the mid-1990s, that is, after the big crisis in the early 1990s, the DTI ratio has almost doubled to a little above 170 per cent currently. This increase in the DTI ratio is what concerns the Riksbank. However, total assets (excluding collective insurance savings) have doubled to about 600 per cent of disposable income. Net wealth has increased to about 420 per cent of disposable income. Including collective insurance savings, total assets and net wealth would be about 720 per cent and 540 per cent respectively of disposable income. Real assets (owner-occupied houses and flats as well as leisure homes) have increased to about 320 per cent of disposable income.

Figure 1: Swedish households' assets, debt and net wealth



Source: Sveriges Riksbank

For leaning against the wind to be justified, presumptions (1) and (2) above need to apply. Regarding presumption (1), it seems that macroprudential instruments and policies are indeed both effective and being used in Sweden, as discussed in Svensson (2013c). Finansinspektionen (the Swedish financial supervisory authority) and the government have in the past few years taken or announced several effective measures, namely a mortgage loan-to-value (LTV) cap of 85 per cent (which has had a clear effect on the loan-to-value ratio for new mortgages, according to Finansinspektionen's annual mortgage market report, *The Swedish Mortgage Market 2013*), higher capital-adequacy requirements for systemically-important banks, and higher risk weights on mortgages. Since the LTV cap was introduced in October 2010, the DTI ratio has been stable at around 170 per cent. Finansinspektionen has also recommended mortgage lenders to provide suggestions to borrowers about individually adjusted amortisation plans. Furthermore, Finansinspektionen, in its annual reports on the Swedish mortgage market, thoroughly monitors that mortgage lending standards are sufficiently 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.

In August 2013, in particular, the government announced a new strengthened framework for financial stability in Sweden (Swedish Government 2013). Finansinspektionen will have the main responsibility for micro- and macroprudential policy, and will control all the micro- and macroprudential

instruments, including the new countercyclical capital buffer. Assigning the main responsibility and control of both micro- and macroprudential instruments to a single authority allows for both efficiency and accountability. Furthermore, a Financial Stability Council has been created, with the Minister of Financial Markets as Chair and with the Director Generals of Finansinspektionen and the Swedish National Debt Office and the Governor of the Riksbank as additional members. The Council will assess financial stability, publish its positions and assessments and manage crises. Sweden should now have an effective framework for financial policy and financial stability. Thus, presumption (1) does not seem to apply in Sweden.

What about presumption (2), that a higher policy rate has a significant effect on threats to financial stability? The Riksbank has admitted that a lower policy rate would result in better target achievement for inflation and unemployment, with inflation closer to the target and unemployment closer to a long-run sustainable rate. However, it has maintained that such a policy would lead to a higher household DTI ratio and thereby increase the risks associated with household debt. A minority of the Riksbank's executive board has argued that the beneficial impact of a higher policy rate and tighter monetary policy on any risks associated with household debt in Sweden is too small to compare with the costs of the resulting too-low inflation and too-high unemployment.¹ The question is: who is right, the majority or the minority?

The Riksbank's leaning against the wind was undertaken without presenting any previous supportive analysis of the impact of monetary policy on household debt and on any risks associated with it. In response to this, I have recently undertaken such an analysis of the impact on household mortgages in Svensson (2013b).

A higher policy rate has, all else equal, a negative impact on housing prices and nominal mortgage debt, as well as on the price level and nominal disposable income. Real debt is the ratio between nominal debt and the price level. The DTI ratio is the ratio between nominal debt and nominal income. Since a higher policy rate has a negative impact on both numerator and denominator of both real debt and the DTI ratio, a priori it is likely that the impact of a higher policy rate on these ratios is small. Furthermore, a priori it is not obvious whether the impact on the ratios will be positive or negative. That depends on the policy rate's relative impact on the numerator and the denominator.

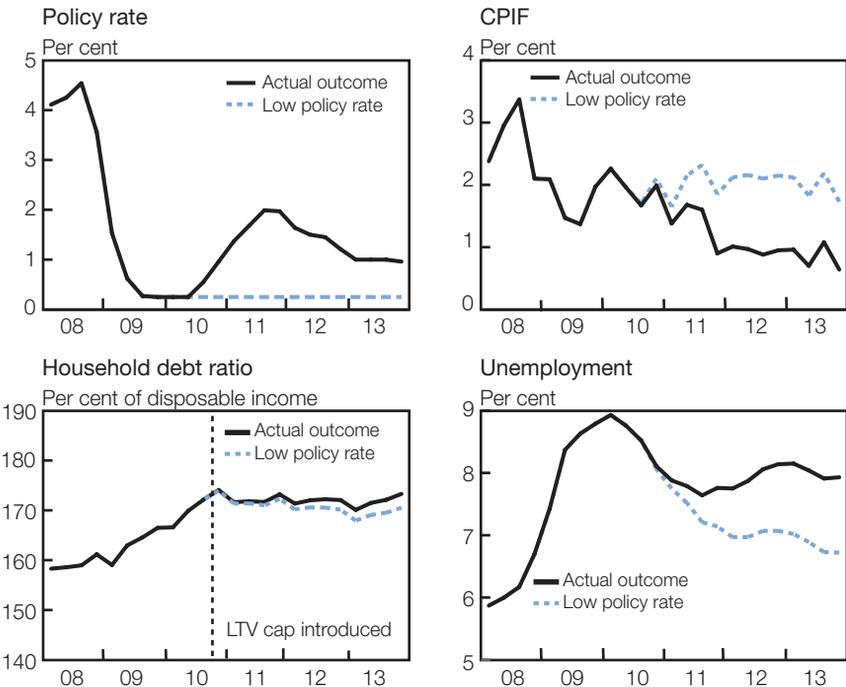
Svensson (2013b) shows that under assumptions that are realistic for Sweden, the policy rate is likely to have a slower impact on nominal debt than on the price level and nominal disposable income.² The main reason is that only a fraction of the mortgage stock is turned over each year. In Sweden, the average loan length of a mortgage is about seven years, and there is little amortisation of debt during the length of the loans. This means

that nominal debt is quite sticky. As a result, a higher policy rate is more likely to increase real debt and the DTI ratio than to decrease them. In any case, the impact on real debt and the DTI ratio is likely to be small. Furthermore, the long-run impact of the policy rate on the ratios is likely to be zero, since these ratios between nominal variables are real variables on which monetary policy normally has no long-run effect.

4. A counterfactual experiment

In order to summarise the effects of the Riksbank’s leaning against the wind, I have used the Riksbank’s main dynamic stochastic general equilibrium (DSGE) model, Ramses, to conduct a counterfactual experiment. This experiment compares the actual outcome for inflation and unemployment to the outcome if policy had been easier (Svensson 2014a). Furthermore, I have combined this with the results of Svensson (2013b) on the impact of the policy rate on the DTI ratio in order to compare the actual and counterfactual outcome for the household DTI ratio. The results are shown in Figure 2.

Figure 2: Actual and counterfactual outcome for the policy rate, inflation, unemployment, and the household DTI ratio



Source: Svensson (2014a)

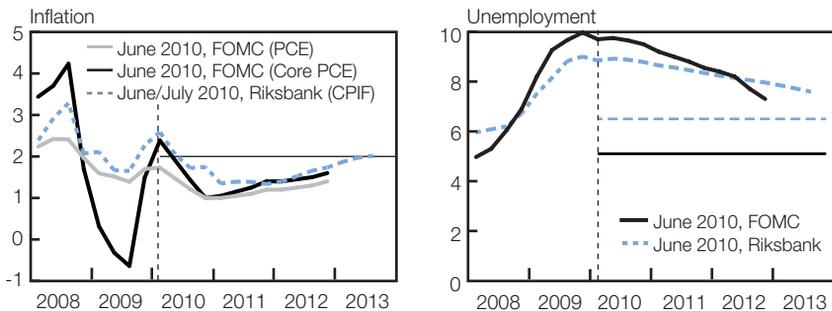
The black solid lines show the actual outcome for the policy rate, the CPIF inflation rate, the unemployment rate and the household DTI ratio.³ The vertical dashed line in the panel for the DTI ratio marks the month, October 2010, when the LTV cap of 85 per cent was introduced.

The blue dashed lines show the counterfactual outcome: the outcome if the policy rate had been kept constant at 0,25 per cent from the summer 2010. CPIF inflation would have stayed very close to the target of 2 per cent, and unemployment might have been about 1,2 percentage points lower. Furthermore, the DTI ratio might have been a bit lower, around 170 per cent of disposable income instead of around 173 per cent, since nominal disposable income might have increased a bit more than the stock of nominal debt. However, the difference in the DTI ratio is in any case too small to have any impact on any risks associated with it.

5. A premature exit

The above counterfactual experiment and Figure 2 give an example of the evaluation of monetary policy ex post, that is, after the fact. However, it is arguably more relevant to evaluate monetary policy ex ante, that is, in real time, taking into account only the information available at the time of the decision.⁴ In this case, it is the information available in June 2010, when the decision to start raising the policy rate was taken. Figure 3 summarises this information in the form of the Riksbank forecasts in June 2010 for the CPIF inflation rate and the unemployment rate. As a comparison, the United States Federal Reserve's Federal Open Market Committee (FOMC) forecasts in June 2010 for personal the consumption expenditure (PCE) inflation and core PCE inflation rates and for the unemployment rate are also shown (see Svensson 2011 for details).

Figure 3: Inflation and unemployment forecasts in June 2010 of the Riksbank and the United States Federal Reserve



Source: Svensson (2011)

The blue dashed line in the left panel shows the Riksbank's inflation forecast. The black and grey solid lines show the FOMC's PCE and core PCE inflation forecast respectively (the median of the FOMC participants' forecasts in the FOMC's Summary of Economic Projections). We see that both central banks' inflation forecasts were below the target (the explicit target of 2 per cent for the Riksbank and the widely understood implicit target of 2 per cent for the Federal Reserve).

The right panel shows the Riksbank's and the FOMC's forecast for the unemployment rate. The horizontal blue dashed and black solid lines show the Riksbank's and the FOMC's estimate of the long-run sustainable unemployment rate at the time. We see that both central banks' unemployment forecasts were significantly above the long-run sustainable rate.

The Riksbank and FOMC forecasts were thus quite similar. The low inflation forecasts and high unemployment forecasts clearly justified easier policy, if possible, for both central banks. Indeed, the FOMC continued to keep the federal funds rate between 0 per cent and 0,25 per cent, and started to prepare easier policy in the form of QE2 (the second round of quantitative easing). But, in contrast, the Riksbank started to raise the policy rate. Such a policy was thus hardly justified by the information available at the time on the outlook for inflation and unemployment.

Thus, from both an ex ante and an ex post point of view, it seems clear that the Riksbank's exit from the low policy rate was premature.

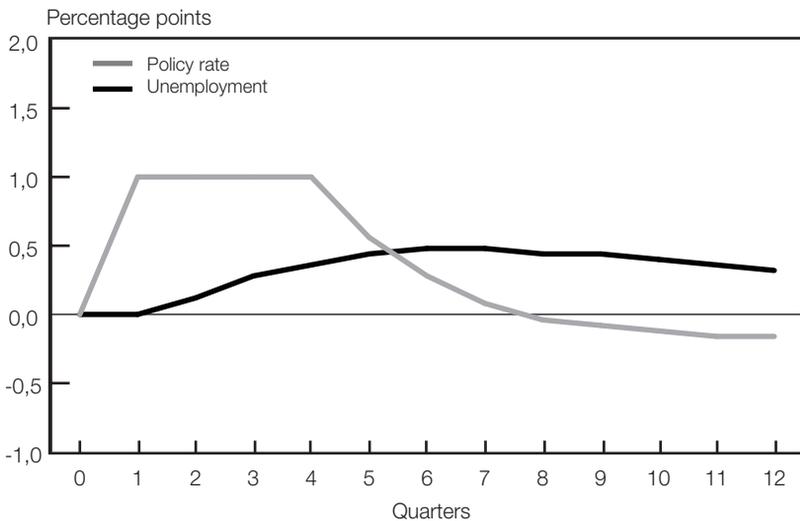
6. The Riksbank's recent estimates

As mentioned, the Riksbank's leaning against the wind was undertaken without any previous supportive analysis of the impact of monetary policy on any risks associated with household debt. Recently, however, the Riksbank (Sveriges Riksbank 2014a) presented its own estimates of the impact of the policy rate on household real debt and the DTI ratio. The Riksbank also regularly publishes, in its *Monetary Policy Report*, its estimates of the impact of alternative policy-rate paths on inflation and unemployment (Sveriges Riksbank 2014b). This makes it possible to assess the relative costs and benefits of the Riksbank's leaning against the wind, using the Riksbank's own estimated numbers.

7. The cost of a higher policy rate

A higher policy rate results in higher unemployment. According to Sveriges Riksbank (2014b, figures 2:13 and 2:15), a 1-percentage-point higher policy rate during four quarters (the grey line in Figure 4) leads to about a 0,5-percentage-point higher unemployment rate during the next few years (the black line in Figure 4).⁵ This represents the *cost* of a higher policy rate, to be compared with any benefits of a higher policy rate.

Figure 4: Effect on the unemployment rate of a 1-percentage-point higher policy rate during four quarters



Source: Sveriges Riksbank (2014b)

8. The benefits of a higher policy rate

A higher policy rate might reduce household indebtedness. The reduced indebtedness might lower the *probability* of a future crisis, with its associated bad macroeconomic outcome with low inflation and high unemployment. The reduced indebtedness might also, conditional on a crisis occurring, reduce the *severity* of a crisis – for instance, reduce the increase in unemployment. The reduced probability of a crisis and the reduced severity of a crisis constitute the *benefits* of a higher policy rate.

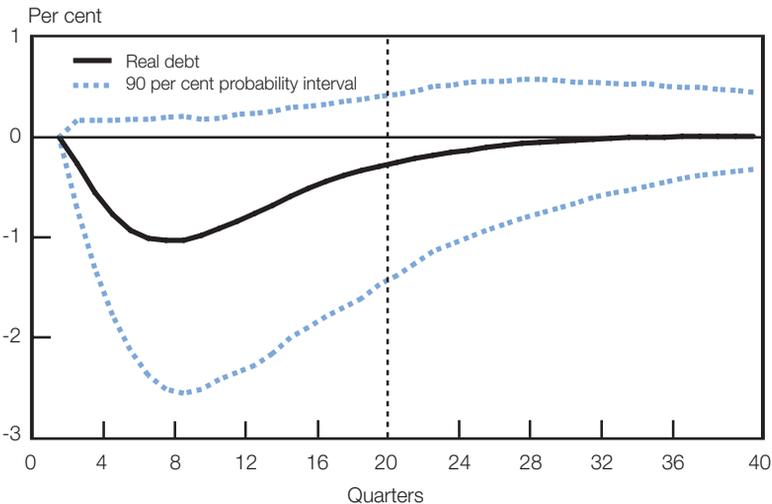
What then are the benefits of a higher policy rate, according to the Riksbank's own estimates?

8.1 How does a higher policy rate affect the probability of a crisis?

So, what is the effect of a higher policy rate on the probability of a crisis? First, regarding the probability of a crisis, Sveriges Riksbank (2013) refers to Schularick and Taylor (2012). According to that paper, lower growth of real debt over a 5-year period reduces the probability of a crisis occurring. More precisely, a 1-percentage-point lower annual growth of real debt for five years (that is, 5 per cent lower real debt in five years) would, everything else equal, reduce the probability of a crisis by 0,4 percentage points.⁶

Second, according to the Riksbank's own estimate, a 1-percentage-point higher policy rate during four quarters results in 0,25 per cent lower real debt in five years (the black line in Figure 5 for quarter 20).⁷

Figure 5: Effect on real household debt of a 1-percentage-point higher policy rate during four quarters



Source: Sveriges Riksbank (2014a)

Altogether, this would thus imply a reduction of the probability of a crisis by $0,25 \cdot 0,4/5 = 0,02$ percentage points. This is, of course, an insignificant reduction of the risk.⁸

The benefit of a lower probability of a crisis can be expressed in terms of lower unemployment, if one makes an assumption of how much higher unemployment would be in a crisis. Sveriges Riksbank (2013, figure A10) assumes a crisis scenario where the unemployment rate becomes about 5 per cent higher. I will use that assumption.

If the probability of a crisis falls by 0,02 percentage points, that is, by 0,0002, the expected future unemployment rate will then fall by $0,0002 \cdot 5 = 0,001$ percentage points. This is thus the benefit expressed in terms of lower expected future unemployment because of a lower probability of a crisis. It is obviously miniscule relative to the cost of a 0,5-percentage-point higher unemployment during the next few years.

The benefit of a higher policy rate, in the form of a reduced probability of a crisis and thereby lower expected future unemployment, is thus completely insignificant compared to the cost in the form of a 0,5-percentage-point higher unemployment rate over the next few years.

Furthermore, in the long run, as is seen in Figure 5, the policy rate has no effect on real debt and thus, according to the Riksbank's estimates, no effect on any long-run risks associated with real debt.

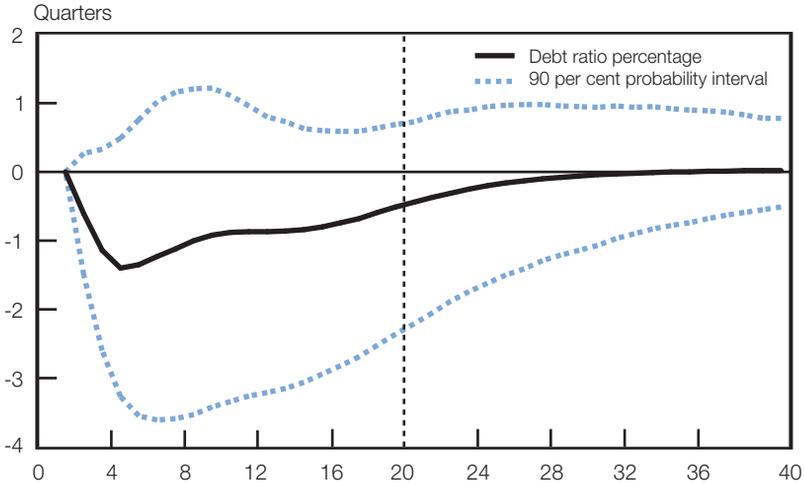
8.2 How does a higher policy rate affect the severity of a crisis?

But what is the effect of a higher policy rate on the *severity* of a crisis? First, according to a note by Riksbank Deputy Governor Martin Flodén (2014, Table 1, Column 2), a 1-percentage-point lower DTI ratio might, all else equal, result in the increase in the unemployment rate in a crisis being 0,02 percentage points lower.

Second, according to Sveriges Riksbank (2014a, Figure A22), a 1-percentage-point higher policy rate during four quarters would lead to a 0,44-percentage-point lower DTI ratio in five years (the black line in Figure 6 for 20 quarters).⁹

Altogether, this means that the increase in the unemployment rate might be $0,44 \cdot 0,02 = 0,009$ percentage points lower, if the crisis occurs in five years. If the crisis occurs with the probability 4 per cent (the average probability of a crisis according to Schularick and Taylor (2012), corresponding to a crisis, on average, every 25 years), the expected lower increase in unemployment is only $1/25$ of 0,009 percentage points. It is clearly completely insignificant.

Figure 6: Effect on household DTI ratio of a 1-percentage-point higher policy rate during four quarters



Source: Sveriges Riksbank (2014a)

If we instead assume as high a risk as 10 per cent, corresponding to a crisis every 10 years, the expected lower increase in unemployment is only 0,0009 percentage points. This is still completely insignificant.

Furthermore, in the long run, as can be seen in Figure 6, the policy rate has no effect on the DTI ratio and thus, according to the Riksbank's estimates, has no effect on any long-run risks associated with the DTI ratio.

9. Adding up

Adding up the two benefits of a higher policy rate, in terms of a lower probability of a crisis and a less severe crisis we get an expected lower future unemployment rate of $0,001 + 0,0009 = 0,0019$ percentage points (where I have used the higher probability of a crisis: 10 per cent). This is, of course, completely insignificant in comparison with the cost of a higher policy rate: 0,5 percentages points higher unemployment during the next few years. The benefit is only about 0,4 per cent of the cost, instead of the more than 100 per cent required to justify the policy of leaning against the wind.

The cost and benefits expressed in unemployment are summarised in Table 1. Clearly, presumption (2) does not apply for Sweden.

Table 1: Cost and benefit in unemployment of a 1-percentage-point higher policy rate during four quarters

Cost: higher unemployment during the next few years, percentage points	0,5
Benefit: lower expected future unemployment, percentage points	
1. Because of lower probability of a crisis	0,001
2. Because of a smaller increase in unemployment in a crisis.....	0,0009
Total benefit, percentage points.....	0,0019
Total benefit as a share of the cost	0,0038

Furthermore, as noted, the Riksbank's estimates are not statistically significant. Also, as discussed in Svensson (2014b), there are reasons to believe that the vector-auto-regression (VAR) model used is misspecified. A more thorough empirical study is necessary to judge whether leaning against the wind might make real debt and the DTI ratio actually increase rather than decrease, as under the assumptions in Svensson (2013b).

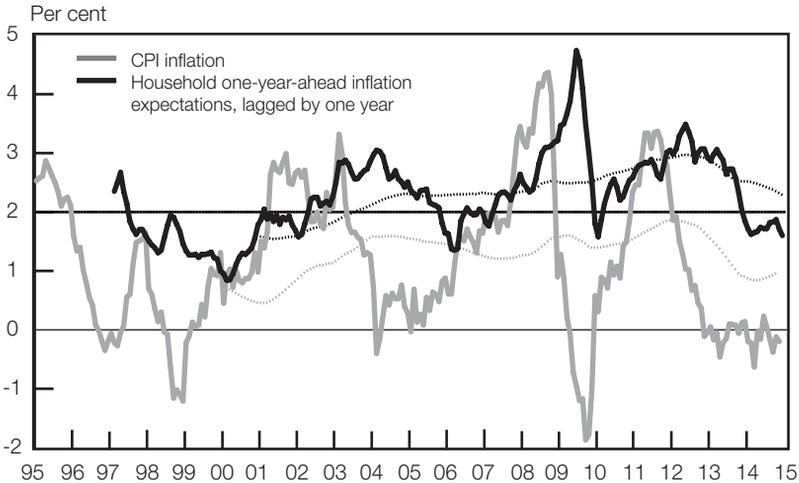
10. The effect of inflation below expectations

However, both the Riksbank's estimates in Sveriges Riksbank (2014b) and my discussion in Svensson (2013b) disregard the effect on real debt of low inflation falling substantially below household expectations during the past few years. This effect increases the cost of leaning against the wind.

Figure 7 shows households' expectations of inflation for the next year, lagged one year (the black solid line), and annual CPI inflation (the gray solid line). Thus, the gap between the grey and the black solid lines shows by how much actual inflation has deviated from previously held expectations.

Actual inflation has indeed fallen much below household expectations. This means that the real value of any given nominal debt has become higher than households have expected.

Figure 7: Household one-year-ahead inflation expectations, lagged one year and CPI inflation

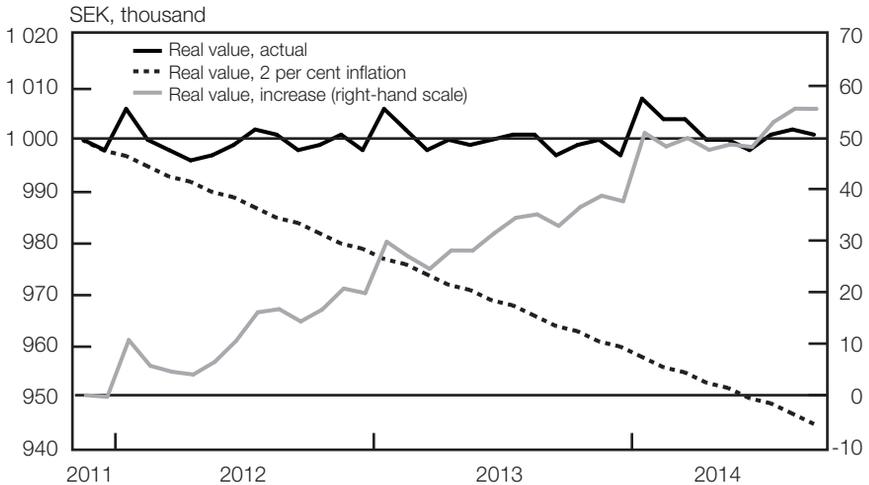


Sources: National Institute of Economic Research and Statistics Sweden

Note: The black solid line shows 3-month moving averages of household expectations of inflation the next year lagged by one year. The dashed lines are trailing five-year moving averages of household expectations and CPI inflation.

Figure 8 shows the real value of a given loan of SEK 1 million taken out in November 2011. The black dashed line shows the real value of the loan if inflation had been 2 per cent. In September 2014, the real value would then have fallen to SEK 945 000. The black solid line shows the actual real value of the loan. Since inflation has been close to zero, the real value of the loan in September 2014 remains at SEK 1 million. The grey line shows the difference between the black solid and dashed lines: the increase in the real value of debt due to actual inflation falling below 2 per cent. The real value is SEK 55 000 higher in September 2014.

Figure 8: Real value of SEK 1 million loan taken out in November 2011, actual and for 2 per cent inflation



This means that the real value of nominal debt has become higher than expected and planned for. The real value of any mortgage that is close to three years old has become almost 6 per cent larger, compared to if inflation had equalled 2 per cent (Svensson 2013a). This is a substantial effect on the real debt – much larger than the one discussed above.

This almost 6 per cent increase in real debt in less than three years can be compared with the Riksbank's estimated reduction in real debt of 0,25 per cent in five years in Figure 2. It is almost 24 times larger in magnitude and of the opposite sign. Using the estimates of Schularick and Taylor (2012), it would lead to an increase in the probability of a crisis of more than 0,4 percentage points, compared with the reduction in the probability of a crisis of 0,02 percentage points. Using the Riksbank assumption of a 5-percentage-points higher unemployment rate in a crisis, it implies an increase in the expected future unemployment rate of more than 0,02 percentage points, compared with the reduction of 0,001 percentage points. Fortunately, an increase in the expected future unemployment rate of 0,02 percentage points is still a small number.

Figure 9 shows, for each date a given nominal loan is taken out, the percentage increase in the actual real value to September 2014, relative to if inflation had been 2 per cent. We see that the real value of a loan taken out in the fall of 2011 has increased almost 6 per cent, in line with the above detailed example. The real value of a loan taken out in 2002 has increased by more than 8 per cent due to average inflation having been below 2 per cent.

Figure 9: Increase to September 2014 in the real value of a given nominal loan, compared to if inflation had been 2 per cent



11. Conclusion

According to the Riksbank's own estimates, monetary policy has a very small effect on any risks associated with household indebtedness. Compared to the large costs of too-high unemployment and too-low inflation, the possible benefit of leaning against the wind is, according to these estimates, completely insignificant.

Furthermore, because the Riksbank's leaning against the wind has led to inflation much below household inflation expectations over the past few years, the real value of nominal debt has become higher than expected and planned for. The real value of any mortgage that is about three years old has become almost 6 per cent larger, compared to if inflation had equalled 2 per cent. This is a much larger effect on real debt than the ones that follow from the Riksbank's estimates. Given this effect, Riksbank policy has almost certainly increased real debt and actually been counterproductive; the Riksbank has consequently made any problem and risks with household indebtedness worse.

Thus, if the purpose is to limit household debt, leaning against the wind does not seem to be an effective policy – definitely not in Sweden. Macroprudential policies are more effective – definitely so in Sweden. As discussed above, Finansinspektionen and the government have used several

effective macroprudential tools, and since August 2013 Sweden has a new strengthened framework for financial stability, with Finansinspektionen having the main responsibility and being accountable for financial stability. It then seems clear that monetary policy in Sweden should definitely not lean against the wind, but focus on stabilising inflation around the inflation target and unemployment around a long-run sustainable rate.

As for other economies, it would seem unlikely that conditions would be such that the policy rate would be an effective measure to affect household indebtedness and manage any risks associated with this. Macroprudential policies are most likely the only effective way to materially affect household debt and manage any associated risks.

Notes

¹ During my six-year term as a Deputy Governor of Sveriges Riksbank and member of the executive board, which ended in May 2013, I belonged to that minority and dissented in favour of easier monetary policy.

² See Svensson (2013b) for details. The assumptions are: (1) new mortgages have a constant LTV ratio of 70 per cent (the average LTV ratio for mortgages in Sweden in the past few years); (2) mortgages are refinanced every seven years (the average loan length of mortgages in Sweden); and (3) mortgages are kept constant until refinanced (consistent with current amortisation behaviour in Sweden). As a result, only a seventh of the mortgages are turned over each year, resulting in the stock of mortgages being sticky and adjusting very slowly. Furthermore, for simplicity, (4) the stock of housing and the number of borrowers is assumed to be constant. In reality, there has been little construction of new housing, but the share of housing owned and the number of borrowers has increased considerably. This trend may not continue in the future, though.

³ CPIF inflation is consumer price index (CPI) inflation calculated with constant mortgage rates. This excludes the direct effect of changing the policy rates on CPI inflation through the effect of changing mortgage rates. The Riksbank's inflation target applies to CPI inflation, but the Riksbank used CPIF inflation to guide its policy.

⁴ See Svensson (2012) for more on the evaluation of monetary policy.

⁵ The figure is constructed from the numerical data for Sveriges Riksbank (2014b, figures 2:13 and 2:15), available at www.riksbank.se. The effect on the unemployment rate of a 0,25-percentage-point higher policy rate during four quarters has been multiplied by 4 to correspond to the effect of a 1-percentage-point higher policy rate during four quarters.

⁶ See Table 3, Sum of lag coefficients, Column (1) to (3), in Schularick and Taylor (2012). I believe the coefficient 0,4 might be too high because data for a

number of reasonable control variables are not available. A lower coefficient would result in an even less effect of the policy rate on the probability of a crisis.

⁷ The figure uses the numerical data for Sveriges Riksbank (2014a, Figure A20) with the opposite sign. We see from the blue dashed lines that a 90 per cent probability interval is not below the zero line, so the effect on real debt is not statistically significantly different from zero, and it may be positive. The policy rate behind figures 5 and 6 returns to zero after four quarters somewhat quicker than in Figure 4, but this does not affect the conclusions.

⁸ According to Schularick and Taylor (2012), the average probability of a crisis is almost 4 per cent (per year). A probability of 4 per cent then corresponds to a crisis on average every 25th year. A reduction of the probability by 0,02 percentage points to 3,98 per cent means that the average time between crises increases by 1,5 months to 25 years and 1,5 months. This is hardly a big increase.

⁹ As noted in Svensson (2014b) and can be seen from the blue dashed lines in Figure 5, the change in the DTI ratio is not statistically significant from zero, and it cannot be excluded that it has the opposite sign.

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