SCHWEIZERISCHE NATIONALBANK
BANQUE NATIONALE SUISSE
BANCA NAZIONALE SVIZZERA
BANCA NAZIUNALA SVIZRA
SWISS NATIONAL BANK

Speech

Embargo
30 May 2024, 2.00 am

The natural rate of interest (r*) as a reference point for monetary policy – a practitioner's view

Keynote Speech
at the 2024 Bank of Korea International Conference

Thomas J. Jordan[*]

Chairman of the Governing Board
Swiss National Bank
Seoul, 30 May 2024

[*] The speaker would like to thank Matthias Burgert for his support in preparing this speech. He also thanks Claudia Aebersold, Alain Gabler, Christian Grisse, Carlos Lenz, Alexander Perruchoud, Petra Tschudin and Tanja Zehnder, as well as the SNB Language Services.

Ladies and gentlemen

I am delighted to be here today in Seoul to address such a distinguished audience. I would like to thank Governor Rhee for inviting me to give this keynote speech.

The topic of this year's Bank of Korea International Conference – 'The Evolution of the Natural Interest Rate and Its Implications for the Global Economy' – could not have come at a better time. Monetary tightening over the past two years has lifted policy rates and longer-term interest rates from their historical lows. There are reasons to believe that some of the structural drivers of real interest rates have also changed direction in recent years. A lively debate has emerged on whether real interest rates will return to their pre-pandemic levels, or whether they will remain higher because the natural rate of interest, r*, has increased.[1]

Over the past years, r* has become an important reference point for monetary policy. The difference between the real interest rate and r* gives a measure of a central bank's monetary policy stance. Therefore, r* estimates help in evaluating different monetary policy options. However, the measurement of r* is subject to high uncertainty. Today I would like to focus mainly on how policymakers can nevertheless make use of r* estimates in practice.

In the first part of my remarks, I will briefly review the developments in real interest rates over the past decades. I will then turn to the concept of r* itself. In the second part, I will discuss how policymakers can use r* in practice to assess the monetary policy stance, and in particular, how they can deal with the inherent uncertainty in r* estimates. Here I will draw especially on the Swiss National Bank's experience.

Developments in real interest rates

Let me begin by looking at the long-term trends in real interest rates.

Real interest rates have declined considerably in most countries over recent decades. In Chart 1, we see a decline in long-term real interest rates in South Korea, Switzerland and, shown in grey, in a number of other advanced economies over the past 30 years. Real interest rates fell from around 4% in the 1990s to slightly below 0% in the decade after the global financial crisis.

What can explain this global downward trend? In essence, it points to a decline in r* and can be attributed to drivers that have increased the supply of savings or decreased the demand for investment over time. The drivers which have received most attention in the literature relate to lower potential growth, higher retirement savings and greater demand for safe assets.

Over the past two years, real interest rates have risen back to a level slightly above zero. This mainly reflects the tightening of monetary policy in many countries, but at the same time raises the question of whether r* has increased again. Indeed, the outlook for the structural drivers of real interest rates is mixed. Factors such as low potential growth and increasing life

[1] Cf. Benigno et al. (2024).

expectancy suggest that real interest rates may remain low. However, there are other factors that could potentially lead to a persistent rise. These include lower savings due to a growing proportion of the inactive population, large fiscal deficits, a productivity boost from new technologies, and substantial investment in the green transition. In my view, it is still too early to judge whether a reversal of the global downward trend in real interest rates is already taking place. Nevertheless, it is very important for policymakers to follow this development closely. Indeed, analysing the structural drivers is necessary to better understand the outlook for r*. I am looking forward to the discussions at this conference, which promise to deepen our understanding of this important question.

r* as reference point for monetary policy

Let me now turn to the role of r* as a reference point for monetary policy.

What is a useful characterisation of r* from the perspective of monetary policy? r* can be interpreted as the real interest rate at which a central bank's monetary policy stance is neither accommodative nor restrictive. In particular, it is the rate that is consistent with stable inflation and a closed output gap in the medium term. The term was already coined at the end of the 19th century.[2] Since the 1990s, however, it has experienced a renaissance, in part because most central banks have moved to an implementation framework centred on steering short-term interest rates.

Like other equilibrium concepts – such as potential output or the equilibrium exchange rate – r* is unobserved and has to be estimated. Empirical estimates of r* should satisfy the following requirements: r* estimates should be unaffected by cyclical and short-term movements in economic aggregates; and they should not depend on monetary policy, reflecting the principle of the long-run neutrality of money.[3] Thus, r* estimates should only reflect real and longer-term – i.e. structural – changes in the economy.

At the SNB, we use a wide range of models to estimate r*. Some focus on potential growth as a determinant of r*, while others distinguish between domestic and international factors that affect r*. We also use financial market expectations of real interest rates in the long run as a measure of r*. In Chart 2, we see a range of estimates from these models for Switzerland. The downward trend of r* in Switzerland is similar to that in other countries. The range was fairly narrow before the COVID-19 pandemic. Since the pandemic, however, it has widened.

r* estimates are subject to considerable uncertainty. Let me highlight two sources of this. The first is uncertainty about the 'right' model. Chart 2 shows us that the estimates from the models can differ substantially at times. The second is the statistical uncertainty surrounding

[2] Cf. Wicksell (1898).

[3] Some have argued that monetary policy itself may have caused the persistent downward trend in r*. Cf. Schnabel (2024) for an overview of the arguments.

the estimate of a specific model. This is evident from the occasionally wide statistical confidence bands around point estimates.[4]

The uncertainty surrounding r* estimates complicates their use in the monetary policy process. Nevertheless, neglecting r* in practical monetary policy considerations would be a mistake.

Monetary policy decision-making with uncertain r*

Therefore, I would like to address the question as to how monetary policymakers can deal with the uncertainty surrounding r* estimates in practice. I will first discuss how to arrive at a measure that can be employed usefully in the monetary policy process despite this uncertainty. I will then explain how both our monetary policy framework and our risk management approach help us deal with uncertainty.

Policy-relevant r* estimate

Given the substantial statistical uncertainty surrounding r* estimates, it is important to arrive at a robust assessment of r* that can then be used for monetary policymaking. Let me call this the policy-relevant r* estimate. What are the requirements for such an estimate? It cannot simply be a mechanical average of all available model estimates. Rather, it must be based on expert judgement. On the one hand, it should reflect the broadest possible agreement among our model estimates. On the other hand, it should also take into account information from outside these models, such as an assessment of structural drivers of real interest rates that cannot be adequately captured in r* models. Furthermore, a realistic assessment of the distribution of risks surrounding the policy-relevant r* estimate is also important.

Let me discuss these aspects in more detail.

Our portfolio approach of different r* models is crucial for arriving at a policy-relevant r* estimate. It allows us to take account of alternative macroeconomic models, as well as different estimation methods. The portfolio approach also protects against the risk that individual r* models could at times give erroneous assessments. In a first step, a sound understanding of the various structural drivers of r* in individual models helps in judging the plausibility of these estimates. Uncertainty about r* can be narrowed down by using expert judgement to select only the most plausible models and to discount models deemed less reliable in certain situations.

Let me give you a recent example where we applied expert judgement to discount information from individual r* models. As is well documented,[5] extraordinarily large swings in macroeconomic data during the early part of the COVID-19 pandemic caused strong

[4] Cf. Benigno et al. (2024) for a quantification of the combined statistical and model uncertainty for the US and the euro area.

[5] Cf. Holston, Laubach and Williams (2023).

fluctuations in r* estimates in variants of the r* model introduced by Laubach and Williams. Our analysis showed that we should discount these models during this episode.

In a second step to arriving at a policy-relevant r* estimate, we apply a robust statistical measure – such as a median – to the range of model estimates selected in the first step. This filters out some of the unsystematic variation that a few outlier estimates might cause.

An additional crucial step on the way to a policy-relevant r* estimate is to cross-check the result of the second step against a broader set of indicators. For instance, an environment where real interest rates have been low or falling, but where inflation remains subdued and no output boom has been observed, suggests a low value of r*. The years following the global financial crisis are a good example. During this period, real interest rates fell to historic lows in many economies, and in Switzerland they even moved into negative territory. Nevertheless, inflation remained low and we did not observe an output boom in Switzerland. This gave us confidence in the assessment that r* must have fallen, in line with our estimates.

Finally, for monetary policy considerations it is also important to have a good assessment of the uncertainty around our estimate of the policy-relevant r*. We need to understand which side we are more likely erring on, and why. Again, a good grasp of the structural drivers of r* estimates is vital for assessing this uncertainty.

So, what is the role of this policy-relevant r* estimate in our monetary policy process? First, it is an important element in our assessment of current monetary conditions. With regard to interest rates, monetary policy is restrictive if real interest rates are above r* and it is expansionary if they are below r*. However, other factors – such as real exchange rates – also play an important part in our assessment. Second, the deviation of real interest rates from r* is essential for our inflation forecast and thus for gauging medium-term inflationary pressure.

While the policy-relevant r* estimate is important for assessing the absolute degree of monetary tightness, it is necessary to emphasise that changes in monetary conditions from one quarter to the next may be assessed more or less independently of potential changes in r*. The definition of r* as a long-run equilibrium value implies that it is typically slow-moving.[6] Therefore, quarter-on-quarter changes in monetary conditions can be assessed simply by looking at the change in real interest rates.

Given its important role in monetary policy decisions, how should we communicate about r*? In light of the high uncertainty surrounding these estimates, publishing a precise number could be misleading. At the same time, publishing a relatively wide range for r* could give the false impression that we have only very limited information about our monetary policy stance. It should also be kept in mind that r* is just one element in monetary conditions; they are also influenced by exchange rates, a broader set of interest rates and other factors. Nevertheless, transparent communication can often be useful, including regarding r*.

[6] The definition of r* used here should be distinguished from other equilibrium concepts that are influenced by cyclical fluctuations. For example, in Woodford (2003) the natural rate corresponds to the short-term real rate in an economy without nominal rigidities but subject to business cycle fluctuations. This measure of r* can fluctuate substantially from one period to another given the materialisation of shocks.

Therefore, we regularly communicate our views about longer-term developments in real interest rates in speeches and news conferences, in particular when there are more fundamental changes in our assessment.[7]

Uncertainty surrounding the policy-relevant r* estimate can be narrowed down to some extent, but it cannot be completely eliminated. Let me now discuss how we deal with the remaining uncertainty by using a risk management approach.[8]

Risk management approach to policy decisions

The risk management approach acknowledges uncertainty and prescribes that a monetary policy decision should be suitable for a range of scenarios. It is therefore important to have a good characterisation of all likely scenarios.

In the specific case of r* uncertainty, a good understanding of the implications of policy mistakes for the inflation outlook is crucial. An overestimation of r* may constitute a downward risk for the inflation forecast for a given interest rate path. And conversely, an underestimation may constitute an upward risk for the inflation forecast. The costs and benefits of different policy options have to be evaluated for all plausible inflation paths. The monetary policy decision should then seek to achieve our objective of price stability for a broad range of possible scenarios.

Our most recent monetary policy assessment in March, when we lowered the SNB policy rate by 0.25 percentage points to 1.5%, offers a good example. In Chart 3, we see that our latest conditional inflation forecast puts medium-term inflation at around 1%. The possibility that r* may have increased represents an upward risk to this inflation outlook. Two considerations are important here. First, how likely is this scenario? Our view was that the risk of an underestimation of r* was limited. Second, would our decision to cut the SNB policy rate still yield an acceptable result if r* was higher than currently thought? The answer was yes. We judged that – even with a somewhat higher r* – our inflation forecast would remain within our medium-term price stability range. Moreover, if upward risks to inflation were to materialise, this would be most likely associated with a weaker Swiss franc, which we could counteract by selling foreign exchange.

In summary, a risk management approach is essential for central banks to handle uncertainty effectively. Ultimately, our decisions are guided by our mandate of ensuring price stability. Before concluding, let me briefly review how the SNB's definition of price stability in our monetary policy strategy also helps us to deal with uncertainty, including that related to r*.

[7] Cf. Jordan (2019, 2022a).

[8] Cf. Jordan (2022b, 2023).

Flexibility in monetary policy strategy

In our monetary policy strategy, we define price stability as a rise in consumer prices of less than 2% per year. Deflation – that is to say a sustained decrease in the price level – also breaches the objective of price stability. We do not have a point target for inflation and thus we do not seek to achieve a specific value between 0% and 2%. Furthermore, we focus on the medium-term inflation outlook, which means that negative inflation or inflation rates in excess of 2% can be temporarily tolerated. This definition allows us to respond flexibly to external shocks and to weigh up the costs and benefits of alternative monetary policy measures. As a small open economy, Switzerland is highly exposed to disruptions from abroad.

Our definition of price stability as a range rather than a point target also helps in dealing with uncertainty related to r*. Let me illustrate this by returning to our most recent monetary policy decision. As shown in Chart 3, our latest conditional inflation forecast sees inflation between 1% and 1.5%. This is based on the assumption of a constant SNB policy rate of 1.5% over the entire forecasting horizon. It also takes into account our estimate that r* is around 0%. There are currently reasons to believe that r* has increased somewhat, or might rise over the coming years. We view this as a small upward risk to the inflation forecast. If this risk were to materialise, our monetary policy stance would be more accommodative than intended. This would lead to somewhat higher inflation in the medium term than currently projected. Since we can let inflation fluctuate within the range of price stability, the current monetary policy would most likely still be compatible with price stability, even if r* was slightly higher. Thus, with price stability defined in terms of a range for inflation, we have more time to properly evaluate potential changes in r*.

To summarise, our definition of price stability means that a wider range of inflation outcomes is acceptable. This also makes small errors in our judgement about r* or other factors affecting the inflation outlook less problematic. By comparison, a point target allows much less flexibility for dealing with this uncertainty. Of course, this does not mean that the wider the range for price stability, the better the results. There is a clear trade-off: a wider range allows more flexibility for monetary policy, whereas a narrower range tends to provide a better anchor for inflation expectations. In Switzerland, our experience shows that a price stability range of between 0% and 2% for inflation has worked well in this regard.[9]

Conclusion

Let me conclude. The natural rate of interest, or r*, is an important reference point for assessing monetary policy. However, r* is unobserved and has to be estimated from the data. These estimates are subject to uncertainty, at times substantially so. Nevertheless, neglecting r* estimates in practical monetary policy considerations would be a mistake. What can central banks do in practice to deal with this uncertainty? At the SNB, an important task of our

[9] Cf. Jordan (2022a), Tschudin and Lenz (2023).

economists is to transform uncertain model estimates into an r* measure useful for monetary policymaking. This policy-relevant r* estimate plays an important role in our monetary policy decisions. And, with our risk management approach to monetary policymaking, we ensure that our decisions are appropriate for a range of scenarios.

A good understanding of the fundamental drivers of r* is important in this respect. To this end, we draw on work from researchers both at central banks and in academia. I am very much looking forward to interesting presentations and discussions on this highly relevant topic at this conference.

References

Benigno, G., B. Hofmann, G. Nuño Barrau and D. Sandri (2024), Quo vadis, r*? The natural rate of interest after the pandemic, *BIS Quarterly Review*, 4 March 2024.

Grishchenko, O., S. Mouabbi and J. Renne (2019), Measuring inflation anchoring and uncertainty: A U.S. and Euro area comparison, *Journal of Money, Credit and Banking*, 51(5), 1053–1096.

Jordan, T. J. (2019), *Monetary policy in the interests of the country as a whole*, 111th Ordinary General Meeting of Shareholders of the Swiss National Bank, Berne, 26 April 2019.

Jordan, T. J. (2022a), *Monetary policy under new constraints: challenges for the Swiss National Bank*, Jackson Hole Economic Policy Symposium, Jackson Hole, 27 August 2022.

Jordan, T. J. (2022b), *Decision-making under uncertainty: The importance of pragmatism, consistency and determination*, SNB-FRB-BIS High-Level Conference on Global Risk, Uncertainty, and Volatility, Zurich, 8 November 2022.

Jordan, T. J. (2023), *Policy-making under uncertainty: The importance of maintaining a medium-term orientation*, SNB-FRB-BIS High-Level Conference on Global Risk, Uncertainty, and Volatility, Zurich, 14 November 2023.

Holston, K., T. Laubach and J. C. Williams (2023), Measuring the Natural Rate of Interest after COVID-19, *Staff Reports 1063*, Federal Reserve Bank of New York.

Schnabel, I. (2024), *R(ising) star?* Speech at The ECB and its Watchers XXIV Conference, Frankfurt, 20 March 2024.

Tschudin P. and C. Lenz (2023), Das geldpolitische Konzept der SNB bewährt sich, *Die Volkswirtschaft*, 2 November 2023.

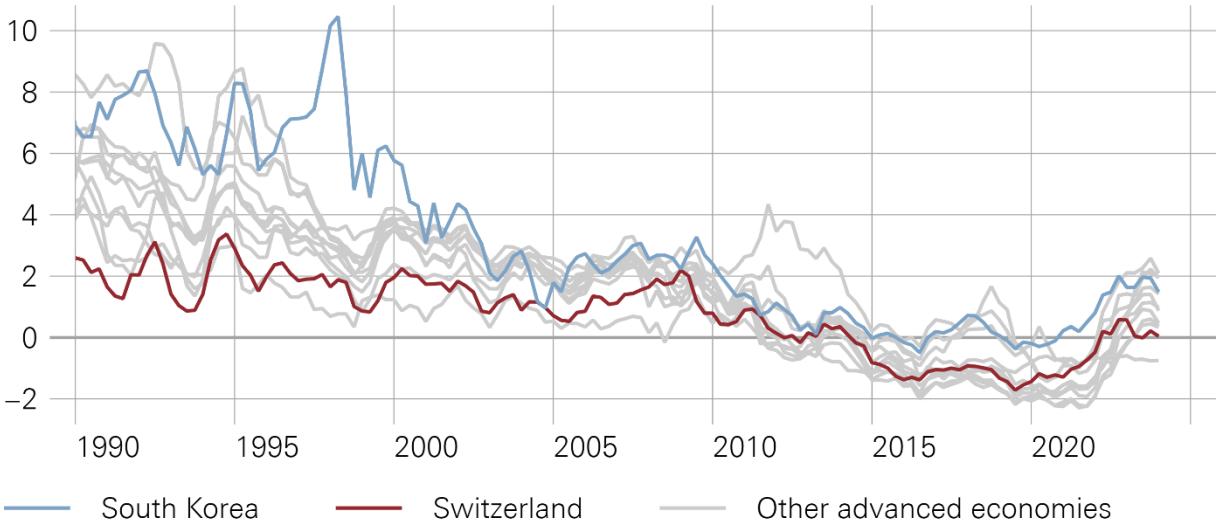
Wicksell, K. (1898), *Interest and Prices: A Study of the Causes Regulating the Value of Money*, Jena.

Woodford, M. (2003), *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University Press.

Chart 1

REAL INTEREST RATES

Quarterly data, 10Y government bond yields, in percent



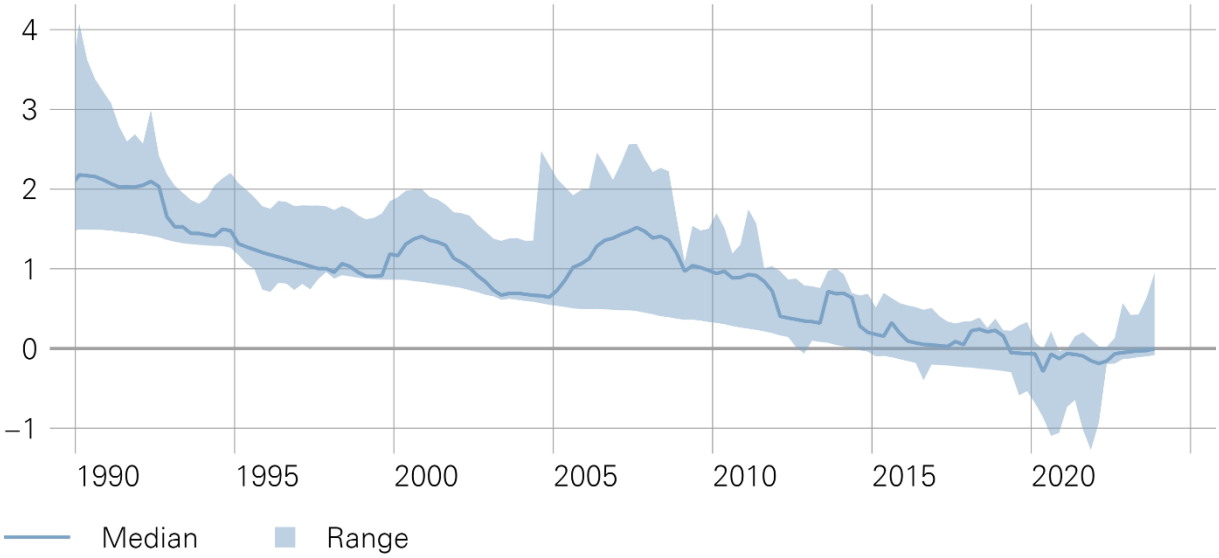
Note: The 10Y real interest rate is calculated as the difference between the 10Y government bond yield and a measure of 10Y inflation expectations based on the model proposed in Grishchenko, Mouabbi and Renne (2019).

Source(s): LSEG Datastream, SNB calculations

Chart 2

SWITZERLAND: RANGE AND MEDIAN OF r* ESTIMATES

In percent



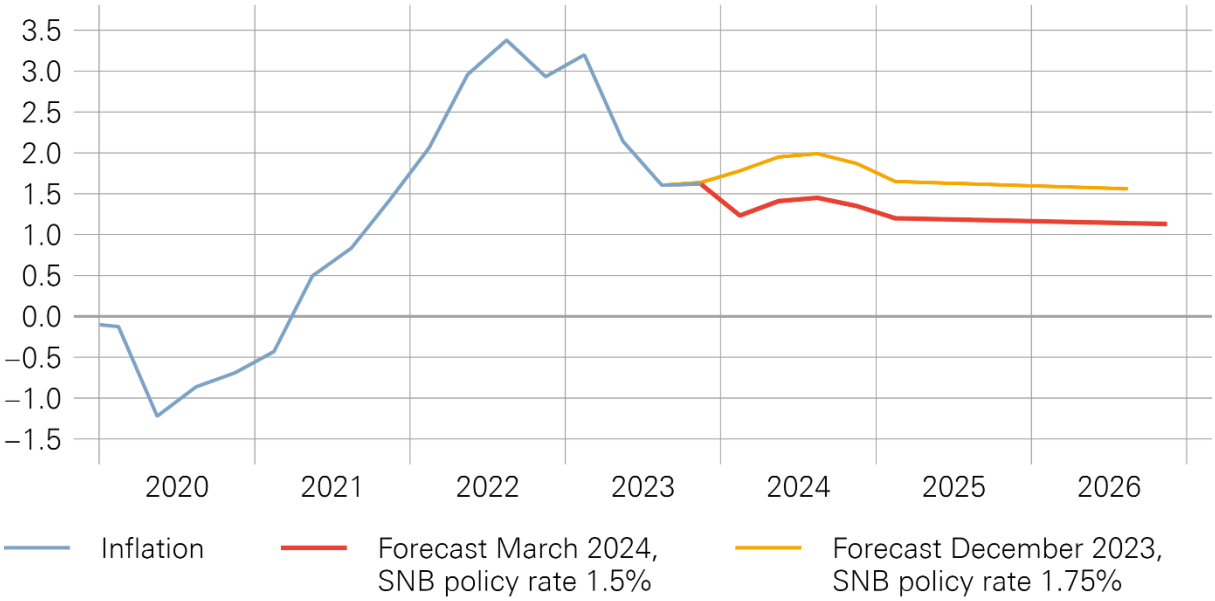
Note: The range indicates the difference between the highest and lowest available r* estimates in each quarter.

Source(s): SNB

Chart 3

CONDITIONAL INFLATION FORECAST OF MARCH 2024

Year-on-year change in Swiss consumer price index in percent



Source(s): SFSO, SNB