

The role of the krone exchange rate under flexible inflation targeting

Speech by Ole Christian Bech-Moen, Executive Director of Monetary Policy, at the Foreign Exchange Seminar of the Association of Norwegian Economists on 2 February 2023.



Executive Director of Monetary Policy, Ole Christian Bech-Moen, at the Foreign Exchange Seminar of the Association of Norwegian Economists. Photo: Nils Aasheim/Norges Bank

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A common feature of periods of price stability has been that the economy has had a fixed nominal anchor. Flexible inflation targeting means that we can promote other aims, such as high and stable output and employment and countering the build-up of financial imbalances. Monetary policy is now geared towards bringing inflation down so that it approaches the target further out. A floating krone exchange rate is what enables us to some extent to choose our own path.

Introduction

When I participated in the Foreign Exchange Seminar a year ago, I noted that consumer price inflation had risen sharply in Norway and in many other countries, against the backdrop of pandemic-related supply-side bottlenecks accompanied by strong demand. Not long after the seminar, peace in Europe was shattered by Russia's invasion of Ukraine.

This led to soaring energy and food prices and eventually to a broad rise in prices for goods and services. At the same time, labour markets in many countries remained tight – also here in Norway. In Norway both imported inflation and domestic conditions have pushed up inflation to its highest levels in over 30 years.

The primary task of central banks is to ensure price stability. Persistently high inflation is costly to society, because among other reasons it leads to uncertainty about the value of money and makes economic planning difficult. Through 2022, the pace of policy rate hikes in Norway and other countries quickened to restrain the rise in inflation and reduce the risk of inflation becoming entrenched at a high level. The Central Bank Act and the Regulation on Monetary Policy require Norges Bank to maintain monetary stability in the form of low and stable inflation. Monetary policy is to be forward-looking and flexible so that it can also contribute to high and stable output and employment and to countering the build-up of financial imbalances.

Norges Bank's task is to set a policy rate that strikes a balance between different considerations. Today I shall take a step back and discuss the importance of the krone exchange rate in our monetary policy regime^[1]. To highlight the importance of the krone exchange rate, I will compare it with a regime in which we alternatively aim towards stabilising the krone exchange rate.

A floating krone enables us to pursue an independent monetary policy

A freely floating krone enables us to pursue an inflation target while promoting other aims decided by the Norwegian authorities. With an exchange rate target, we are bound instead to the monetary stance determined by objectives set in other countries. Tying ourselves to the mast by binding ourselves to a foreign monetary policy regime can be an objective in and of itself but would entail considerable implications for the appropriate degree of the monetary stance in relation to the economic situation in Norway. It is especially true when facing asymmetric shocks, but also when our monetary policy objectives and trade-offs deviate from those of other countries. Given the shocks that have hit the economy now, a fixed exchange rate objective would require us to follow foreign interest rates and the trade-offs between inflation and other considerations that others make.

The trilemma in international finance states that only two out of the following three objectives are attainable: free capital movements, a fixed exchange rate or an independent monetary policy. Most countries have chosen free capital movements long ago. In practice the choice then becomes between a fixed exchange rate and an independent monetary policy. It therefore follows from this trilemma that free capital movements and a fixed exchange rate do not permit us to pursue an independent monetary policy. This is because given free capital movements, differences in risk-adjusted returns across countries can set in motion large cross-border capital flows. A fixed exchange rate imposes

an equalised risk-adjusted interest rate. In practice, it means that interest rates in Norway must follow the interest rates in the world's major economies.

When the economy is hit by shocks, stabilising the exchange rate implies that price and wage *levels* must also adjust so that competitiveness is in line with long-run relationships. When prices and wages at home rise less than abroad, our competitiveness improves. Over time, domestic prices and wages will then have to rise in order to return to their long-run relationship. If competitiveness remains persistently strong, speculation may arise as to whether the krone will be revalued. The situation may be even more demanding when competitiveness is weak. In that case, prices and wages will need to fall compared with those in other countries. If this is unsuccessful, the exchange rate may come under pressure from speculative attacks in foreign exchange markets. Since central banks usually have limited foreign exchange reserves for defending the exchange rate, economic policy will have to change to drive down the price and wage level and/or the authorities will have to allow the exchange rate to depreciate. When the exchange rate is allowed to depreciate, the need for domestic prices and wages to adjust to ensure competitiveness is reduced. The exchange rate will then be part of the adjustment towards stable competitiveness. Under both fixed and floating exchange rates, price and wage formation are important for the adjustment, but I will not go into details about this relationship today.

Research findings^[2] based on data for various countries confirm that adjustments differ under a fixed exchange rate and flexible exchange rate. Inspired by the literature, I will start with the theory of purchasing power parity to explain this phenomenon.

In its simplest form, the theory states that a basket of consumer goods will cost the same across countries when priced in a common currency. This chart shows the definition of the real exchange rate. Here, “q” expresses the real exchange rate. It depends on the nominal exchange rate and relative foreign prices and domestic prices. (“v”) expresses the NOK amount we must pay for a dollar or a basket of other currencies. When “q” rises, the real exchange rate weakens. This means that a basket of goods costs more abroad than at home. When “q” falls, the real exchange rate will strengthen. This means that a basket of goods now costs less abroad than at home. Empirical evidence shows that the real exchange rate has a tendency to revert to a level determined by structural conditions (“q*”). A well-known example based on these relationships is *The Economist's* “Big Mac Index”, which measures the relative price of a burger across countries.

When “q” is equal to 1, we get what is called absolute purchasing power parity. The burger then costs the same, measured in the same currency. However, it is more reasonable to assume that it is the relative relationship between foreign and domestic prices in a common currency that are determined by structural conditions.^[3] Owing to trade barriers, preferences and differences in baskets of goods, prices will not completely equalise. This means that “q” can deviate from 1. The burger can then be cheaper in one country than in another.

Furthermore, research shows that when the real exchange rate deviates from its long-run level, it will tend to revert to its long-term level as domestic prices adjust to prices abroad under a fixed nominal exchange rate. Under inflation targeting and flexible exchange rates, the reversion occurs through an adjustment of the nominal exchange rate.

In the remainder of my speech, I will use real exchange rate and competitiveness more or less interchangeably. The real exchange rate, as I have measured it here, is only one of several measures of competitiveness. Another measure, which provides a more direct indication of the cost competitiveness of Norwegian manufacturing, is relative hourly labour costs in a common currency.

Historical review of economic adjustments under fixed and floating exchange rates

We can find the mechanisms outlined above in various historical examples from Norway. . This chart shows bilateral exchange rates against the UK, Denmark, Sweden and the US, which have long been our main trading partners.

My first example is the early years after the establishment of Norges Bank in 1816. At the time, the authorities wanted to attain price stability by binding Norway to other countries through the silver standard with our own currency. Hyperinflation in the preceding years, when Denmark-Norway participated in the Napoleonic Wars, showed how vital an orderly monetary system was. The authorities decided that the new currency, the *speciedaler*, would be pegged to silver at par, but it took a long time for the authorities to honour this promise. The exchange rate was simply too weak. This reflects a price level that was too high. Redemption at par would have led to a tightening of liquidity and pressure on silver holdings. This illustrates an important adjustment mechanism under a fixed exchange rate regime. Prices needed to fall first. The promise of redemption in silver at par was not honoured until 1842, and a fixed exchange rate system lasted until the First World War.

History tells us that Norway adopted the gold standard and introduced the krone as its currency unit in 1874. We then became a part of an international fixed exchange rate system linked to the price of gold.

My second example begins with the First World War. Over the course of the war and into the early 1920s, the krone depreciated sharply and fell in value relative to gold. The backdrop was strong money growth fuelled by government spending, high inflation and a lack of credibility in foreign exchange markets. The exchange rate kept falling in value until the mid-1920s, before rebounding when foreign exchange markets became convinced that Norges Bank, headed by Nicolai Rygg, would be able to restore the gold value of the krone to its pre-war level. The krone was once again an attractive investment for agents in the foreign exchange market. The krone's pre-war par value was attained in 1928 after several years of deflation. Nevertheless, the fixed exchange rate system

linked to the price of gold lasted only until the next economic crisis at the beginning of the 1930s. Then the gold standard became a straitjacket for stabilisation policy. These years again illustrate an important challenge associated with a fixed exchange rate regime. Making trade-offs between different objectives can prove quite difficult.

A third historical example is the years after the gold standard was abandoned, which was 50 years ago this year, and up until the early 1990s. The Bretton Woods system had collapsed after inflation rose in the US and the conditions for stability relative to gold were no longer in place. Exchange rates between major economies were either adjusted frequently or allowed to float. Norway undertook numerous devaluations through the 1970s and 1980s to restore competitiveness, but to no avail as other countries also did the same. The devaluations fuelled wage-price spirals. In 1986, the Norwegian authorities sought to break this spiral and restore price stability. Following a final devaluation, the authorities chose to defend the new value of the krone in the subsequent years. Norges Bank used the policy rate to achieve this objective and had to keep the policy rate high despite the economic downturn and banking crisis at the end of the 1980s. Higher interest rates in reunited Germany contributed to this situation. Thus, the rigorous fixed exchange rate policy led to a high interest rate in an economic downturn, but inflation came down.

After a breakdown of the European exchange rate mechanism in 1992, Norway also abandoned its currency peg and after some years adopted inflation targeting.

In the historical review, I indicated what happened to prices. Let us take a closer look. This chart shows inflation measured as a 10-year moving average over the same time period. We can see from the chart that prices were relatively stable from the early 1800s and the First World War.^[4] This reflects stable exchange rates and stable prices abroad. The average annual rise in prices in Norway was around zero percent in the period up until the First World War.

Inflation volatility was high in the interwar period both in Norway and in other countries, but volatility was particularly high in Norway. This may be due to the collapse of the monetary system and the marked krone depreciation we saw in the previous chart, followed by the deflationary policy in the 1920s intended to strengthen the krone.

After the war, the fixed exchange rate policy under Bretton Woods combined with relatively stable inflation in the US led to stable inflation in Norway, until the system broke down, as I mentioned. In the 1970s and 1980s, there was renewed volatility in inflation.

From the early 1990s, inflation has been low and unusually stable. The emphasis on inflation targeting has likely contributed to this situation, in addition to favourable structural conditions in the economy. The krone has often functioned as a shock absorber that has dampened the impact of

economic shocks. An example is the oil price fall that hit the Norwegian economy in 2014. Norges Bank then pursued a more expansionary monetary policy and the krone depreciated. A counterfactual analysis performed by Norges Bank staff shows that a fixed exchange rate would have amplified the downturn.^[5]

In my view, history shows that a floating exchange rate has not been essential for attaining price stability. There have been many periods under a fixed exchange rate that functioned well as long as economic policy in general was geared towards nominal stability. But it is probably only under flexible inflation targeting and a floating exchange rate that monetary policy can promote other aims specific to Norway.

Model exercise shows the importance of an independent monetary policy

I will now show a model exercise that illustrates this point. To highlight the exchange rate's importance, I will compare economic developments under different monetary policy regimes. We assume an unexpected interest rate increase among our trading partners. The increase may reflect a shift in trade-offs between monetary policy considerations abroad or be viewed as an asymmetric shock since it only affects other countries.

I begin with a so-called New Keynesian DSGE model that is quantified for the Norwegian economy.^[6] An assumption in the model is a long-run fixed real exchange rate. In practice, the long-run level may change over time. The development of a petroleum sector and phasing-in of petroleum revenues are the primary reason for a real appreciation of the Norwegian krone vis-à-vis other currencies over the past 50 years, a trend that probably came to a halt with the oil price fall in 2014. Nevertheless, for our exercise, it is a reasonable assumption to keep the real exchange rate fixed in the long run, since it does not depend on monetary policy.

In the model, agents in the foreign exchange market are forward-looking and invest based on expected interest rate differentials, so-called uncovered interest rate parity. When the exchange rate floats freely, higher interest rate expectations in other countries than in Norway will result in an exchange rate depreciation. The opposite occurs when foreign interest rate expectations decline. Under a fixed exchange rate regime, domestic interest rates must constantly follow foreign interest rates.

In this chart, I look at the effects under a more and a less flexible inflation targeting regime. Under a more flexible regime, the central bank puts relatively large weight on stabilising output. Under a less flexible regime, it puts relatively large weight on stabilising inflation. When foreign interest rates rise, exchanging Norwegian kroner for foreign currencies becomes more attractive. This weakens the krone and contributes to higher imported inflation. At the same time, foreign demand for Norwegian goods is reduced owing to weaker

external economic developments on account of the interest rate increase that has taken place abroad. This pushes down output.

In both cases, the central bank in the model will raise the policy rate to dampen inflation. In the case of a more flexible inflation targeting regime, the policy rate is increased only slightly. Inflation remains high for longer. In the case of a less flexible inflation targeting regime, the policy rate is increased more. This curbs the rise in inflation and results in a sharper decline in output. But under a less flexible inflation targeting regime, the krone also depreciates. This is because in this case, too, interest rates will rise less than in other countries. The interest rate differential against other countries thus falls in both cases in the model. The krone depreciation is permanent.

Under a fixed exchange rate policy, the interest rates in the model follow interest rates abroad on a one-for-one basis so that the krone does not depreciate. Output falls sharply and more than under inflation targeting. This leads to a fall in prices.

This chart illustrates that developments in the real exchange rate are dominated by the nominal exchange rate and that both depreciate under inflation targeting. Under a fixed exchange rate policy, the real exchange rate will first appreciate for a period owing to lower inflation abroad resulting from the interest rate increase. Even though competitiveness, as measured by the real exchange rate, is more stable under a fixed exchange rate, it comes at the expense of greater variability in output, employment and inflation in this instance.

So far, I have only looked at a shock originating abroad. In the case of symmetric shocks, developments in output, prices and exchange rates will depend on the trade-offs made by the central bank in the model. There is ample room for varying degrees of flexibility in inflation targeting in this model.

The model represents a highly simplified version of reality. In the model, the exchange rate is driven by uncovered interest rate parity and an assumption that relative purchasing power parity holds in the long run. In reality, there is of course no guarantee that the exchange rate will react as systematically as in the model. There may be less room for flexibility in monetary policy in a small open economy like Norway than in this model.

Conclusion

A common feature of periods of price stability has been that the economy has had a fixed nominal anchor. The nominal anchor is now low and stable inflation over time. Flexibility in inflation targeting means that in response to shocks, we can promote other aims, such as high and stable output and employment and countering the build-up of financial imbalances.

Looking again at the current economic situation, inflation is now too high. As shown in our previous *Monetary Policy Report*, the monetary stance is geared

towards bringing down inflation so that it approaches the target further out. A floating krone exchange rate is what enables us to some extent to choose our own path.

Thank you for your attention.

Footnotes

[1] This speech builds further on Ida Wolden Bache's speech "Who decides the interest rate in Norway?" delivered at the Foreign Exchange Seminar of the Association of Norwegian Economists in 2018.

[2] [Eichenbaum, M. S., Johansson, B. K. and S. T. Rebelo \(2021\): "Monetary Policy and the Predictability of Nominal Exchange Rates", *Review of Economic Studies*, 88, pp 192-228.](#)

[3] [Taylor, A. M. og M. P. Taylor \(2004\): "The Purchasing Power Parity Debate", *Journal of Economic Perspectives*, 18, 135-15.](#)

[4] For a further discussion of price history, see Qvigstad, J.F. (2005): "[500 years of price history: Price stability is the norm. What distinguishes the abnormal?](#)", [Norges Bank Staff Memo 7/2005.](#)

[5] [Eitheim, Ø and J.F. Qvigstad \(eds\) \(2020\): "Norway's road to inflation targeting: Overcoming the fear of floating – counterfactual analyses of four episodes" *Norges Bank Occasional Papers* 56/2020.](#)

[6] [Gali, J. and T. Monacelli \(2005\): "Monetary Policy and Exchange Rate Volatility in a Small Open Economy", *Review of Economic Studies*, 72, 707-734.](#)