

Introduction

Ángel Estrada
Iván Kataryniuk

At present, most of central banks set an inflation target for monetary policy and move the relevant nominal short-term interest rate to hit that objective. The idea is that higher (lower) nominal interest rates, in a context of price rigidity, implies higher (lower) real interest rates, and, this, through different channels, means lower (higher) aggregate demand. For a given (potential) supply, less (more) demand pressure implies a reduction (increase) in inflation. This approach implicitly assumes that we know with certainty the level that the real interest rate should have when inflation is at the target and that it does not change over time. Thus, real interest rate above (below) that level will reduce (increase) the pressures on inflation. However, the reality is much more complex, as that equilibrium interest rate, or natural interest rate, is not observed and, therefore, should be estimated (thus introducing uncertainty) and, probably, it can change in line with the evolution of its structural determinants.

The economic literature provides various definitions of the natural interest rate, although all of them agree that it would be the real interest rate that would prevail in a context in which the main economic variables are maintained at levels that are considered desirable. In particular, Woodford (2003) considers that the natural interest rate would be the one that will arise in an economy in which all prices

and wages were perfectly flexible, thus implying that output will hit its potential level and inflation will be zero. On their part, Holston *et al.* (2016) define the natural interest rate as the one that guarantees that GDP grows at its potential rate and inflation remains constant. Likewise, Summers (2014) defines the natural interest rate, as that consistent with a situation of full employment. As a consequence, an optimal monetary policy design would be one in which the real interest rate approaches its natural level, so that variables such as GDP and employment are at their potential levels and inflation remains low and stable (Galesi *et al.*, 2016). Thus, a real interest rate above the natural one is usually interpreted as an indicator of a “contractive” tone of monetary policy, while the reverse situation denotes an “expansive” monetary tone.

The debate on the level of the natural interest rate has become increasingly popular in advanced economies, as the empirical evidence shows that it has diminished significantly, even reaching negative values. In fact, there are well-founded reasons supporting that empirical evidence. As the natural interest rate is the interest rate that equilibrates the supply and demand of loanable funds, any factor that shift any or both curves could imply a change in the natural interest rate. In particular, if the saving rate (the supply of funds) has increased permanently, the investment rate (demand of funds) has declined structurally, or both, the natural interest rate should have diminished. In this respect, the academics consider that structural forces like aging population or increasing uncertainty, plus other transitory but highly persistent elements such as the deleveraging process of households and firms or the demand of safe assets by emerging economies, could have increased permanently the global saving rate. On its part, reduced productivity growth or the increasing relevance of the knowledge economy could have reduced permanently the global investment rate. These displacements of the supply and demand of funds curves would be so big that the natural interest rate could have become nil or negative.

This situation was denominated “secular stagnation” by L. Summers in a speech at the IMF (Summers, 2014). When, in a context of low inflation, the natural interest rate is negative, conventional monetary policy would have serious difficulties to be effective, since there is a lower limit to the level that the nominal interest rate set by the central bank can reach. That limit would be zero or a slightly negative number, as households and firms have always the possibility of maintaining their liquid assets in form of cash, whose nominal yield is zero. If the lowest nominal interest rate is (slightly below) zero and inflation is very reduced, the minimum real

market interest rate that could be reached could be higher than the equilibrium one and the economy could enter a persistent situation of insufficient demand and excessive unemployment.

The monetary policy has different options to face this situation. The first is to reduce the interest rates not only in the short term, as conventional monetary policy does, but also in the medium and long run, that probably are the horizons more relevant for the agents deciding on their savings and investments. One way of doing this is that the central bank commits with the agents to maintain in the future the very low interest rates actually observed (forward guidance). If the central bank is credible, this should reduce the term premia of the interest rates. A second possibility is to implement programmes of Quantitative Easing (QE). This non-conventional monetary policy action implies that the central bank buys in the secondary markets public or private debt with medium and long-term maturities. As the agents selling those assets have to replace them in their portfolios, total demand increases and therefore their prices, thus reducing their yields and those of the closest assets, by cutting the risk premia. Notice that contrary to forward guidance, the effectiveness of that kind of programmes does not depend on the credibility of the central bank. However, both alternatives could be implemented at the same time, as they reinforce each other. If the central bank does not comply with the forward guidance and its balance sheet is plenty of medium and long term debt, it is going to be the first in suffering the losses.

As it always happens in economy, the unconventional monetary policy is not free of charge. There is theoretical and empirical evidence showing that during periods of compress term and risk premia, the financial market participants accumulate more risks (Martínez-Miera and Repullo, 2018). Besides, it is well known that very reduced short and long-term interest rates for long periods of time damage the profitability of insurance companies and pension funds. More recently, a new concept of interest rate has been coined, the reverse rate (Brunnermeier and Koby, 2018), to capture the negative nominal interest rate below which additional reductions damage bank profitability and solvency, thus impairing the transmission of monetary policy to the real economy. Therefore, it seems there is a limit to what monetary policy can do to face a secular stagnation problem and, in any case, the macroprudential policy should be ready to act in case that the accumulation of risks threatens the financial stability, thus aggravating the problem of weakness in the real demand.

Since the global financial crisis, an increasing number of central banks have implemented measures that can be classified as unconventional monetary policy, but academics have proposed other possibilities. A possibility is increasing the inflation target of the central bank. This, mechanically, will reduce the real interest rate for a given nominal interest rate, thus allowing the central bank to hit more negative nature interest rates. The main problem with this approach is the credibility of the central bank. In most of the advanced economies it has been proved very difficult to hit the current target, so achieving a higher one should be even more difficult. For these reasons, some analysts consider that other policies should also contribute to solve the problem. The first possibility is fiscal policy, thus using the public demand to complement the lack of private demand. In particular, public investment seems to be the most appropriate item to impulse, as, besides, by developing the infrastructures of a country, the private sector productivity can be enhanced thus attracting private investment. The major problem with this recommendation is that, currently, public debt shows a very high level and only the countries with fiscal space can implement fiscal expansions without putting at risk their fiscal sustainability. Other possibility is introducing structural reforms in the economy to reduce the ageing problem and to increase potential growth of the economy. In this case, it should be taken into account that usually it takes time for these reforms to have relevant impacts in the economy.

Nowadays, it is difficult to think that emerging markets are facing a similar problem than most of the advanced economies. Population of emerging countries is still relatively young and in most of the cases is growing at higher comparative rates. At the same time, their productivity level is well below that of the advanced economies, so only by converging in institutions and technology to the advanced economies they can generate higher increases in total factor productivity (TFP). Furthermore, they will need to increase their capitalization rate, implying higher investment rates. Those factors will guarantee in the short to medium run a potential growth rate much higher than that of the advanced economies, and this is a crucial factor to guarantee that the natural interest rate stays in significant positive values.

However, nothing guarantees that the natural interest rate has remained stable and has not followed a downward path similar to that of the advanced economies. In fact, there are very good reasons to think this is the case. On the real side, the population dividend is diminishing rapidly in the biggest emerging economies and there is evidence that TFP is

also decelerating. On the financial side, the last few decades can be characterized by a deep integration of the countries. Most of the barriers to free capital movements have been lifted, especially in the case of the emerging markets, and this has resulted in a surge in international capital flows, with the stock of foreign financial assets held by all the countries reaching historical highs. Even taking into account that the global financial crisis slowed down that process, it is reasonable to think that the natural interest rate is determined at a global level as the equilibrium outcome of global desired saving and desired investment. Obviously, in that configuration, the countries that are financial centers and are able to issue global safe assets would play a central role in the determination of financial prices. From that perspective, the evolution of the natural interest rates of emerging economies can be rationalized as the sum of the natural interest rates of advanced economies plus the country-specific differential potential growth and risk profile.

Therefore, the adequate measurement of the equilibrium interest rate continues to be very relevant for emerging countries, since, depending on that, the tone of the monetary policy could change drastically for the same level of the nominal interest rates. This is the particular case of Latin-American economies, where some central banks have conjectured that the natural interest rate could have fallen significantly.

Based on these reflections, the research lines addressed in this book were classified in three major groups:

1. Methodologies for estimating the natural interest rate

The estimation of the natural interest rate, like any other unobservable variable, is subject to uncertainty and requires assumptions about the relationship between it and other observable variables. In addition, in the case of open economies such as most emerging markets, the natural interest rate will be influenced by the uncovered parity of interest rates, and, therefore, will be subject to variations in the perception of risk and the exchange rate. Besides, different models can be used in the estimation process, ranging from univariate time series filters where the trend is identified with the natural interest rate, to general equilibrium models, based on the economic relations typical of the neo-Keynesian economy (Del Negro *et al.*, 2015), plus semi-structural models (i.e. structural autoregressive vectors, SVAR), the possibilities are multiple.

In fact, the papers included in this section are well aware of the high uncertainty regarding the estimates of the natural interest rate, and then they

calculate and compare the estimates using different empirical approaches. It consists of five papers studying two Caribbean economies (Jamaica and Dominican Republic), two Central American economies (Costa Rica and Honduras) and a South American economy (Bolivia).

In *Assessing the Usefulness of the Neutral Rate of Interest to Monetary Policy in Jamaica*, Alexander Lee and Carey-Anne Williams present estimates of the natural interest rate in their country by means of four different techniques: a regression based on an interest rate parity condition, a VAR with time-varying parameters, a DSGE model calibrated to the Jamaican economy and a statistical filter. They assess the validity of the estimates for inflation forecasting. All the estimates point to a decrease of the natural rate in the last ten years, as a result of the decline of the foreign interest rate and the structural changes of the economy, leading to a decrease in the country risk premium. The estimates point to an accommodative monetary policy under current conditions, and a real natural interest rate in the range of -2.6 and 2.6.

Evelyn Muñoz Salas and Adolfo Rodríguez Vargas estimate the real neutral interest rate in Costa Rica using six different methodologies. The econometric analysis includes VARs, the Laubach and Williams (2003) semi-structural model (henceforth LW) and modified Taylor rules. They select the estimates of the real policy rate gap that perform better in terms of a negative lead correlation with the output gap and core inflation, with the double objective of calculating the current value for the natural interest rate, which is around 1.5%, and to perform an assessment of the monetary policy stance in Costa Rica during the years 2009-2018.

In the same vein, the contribution of the Central Bank of Honduras, presented by Fredy Fernando Álvarez, uses several statistical methodologies to calculate the current real natural interest rate in Honduras. Interestingly, the results corresponding to the dynamic methodologies, such as statistical filters or the LW methodology, show an increase in the natural interest rate in the economy, as opposed to the general tendency presented in the rest of the papers.

Somewhat differently, the fourth chapter, written by José Manuel Michel of the Central Bank of the Dominican Republic, calculates the natural interest rate using an interest rate parity condition and error correction models. He finds a decreasing trend in the natural interest rate in the Dominican Republic, consistent with the high impact of external interest rates in the economy.

Finally, in the case of Bolivia, Paul Estrada Céspedes and David Zeballos Coria present estimates of the natural interest rate in Bolivia using the LW methodology. Interestingly, in Bolivia there is not a reference interest rate, and it has to be derived from the different monetary policy operations of the Central Bank. They find that monetary policy has been, in general, very accommodative in the last few years, which is consistent with a positive and large output gap.

2. The determinants of the natural interest rate in emerging economies

As we pointed before, there is a wide literature on the determinants of the recent drop in the natural interest rate in advanced economies, both from the perspective of excess savings (for demographic, redistributive or global savings glut) as well as the shortage of investment (due, for example, to less innovation or a lower impact on the productivity of existing innovations). However, there are less references on the evolution of the natural interest rate in emerging economies. This section tries to fulfil this vacuum.

In particular, the studies included here both calculate the natural interest rate in the respective economies –Mexico, Peru and Uruguay– and also provide information about the main determinants. By focusing on long run factors, it is concluded that productivity growth, demography and external developments are the main factors governing the evolution of the natural interest rates.

In the first chapter of this section, Carrillo *et al.* perform an analysis of the long run interest rate in Mexico. The long run interest rate is calculated using several methodologies, including a neoclassical growth model, an augmented Taylor rule –including the shadow interest rate in the US–, and an affine term structure model. All the estimates are consistent with a natural rate of interest around 2.5%, somewhat lower than in the previous decades. Behind this evolution, the authors make a heuristic investigation, pointing to a higher supply of loanable funds resulting from more national and foreign savings, population and productivity dynamics.

In the second chapter, Luis E. Castillo and David Florian Hoyle use a multivariate filter on the Central Bank projection model to jointly derive the output gap, potential growth and the natural interest rate. They find a relatively stable natural interest rate, at around 1.3%, since the financial crisis, when it fell from previous higher levels. Potential growth has been declining in the last few years. In order to explain their results, they turn

to a reduction in TFP growth, partially explained by a persistent decline in terms of trade and the lack of structural reforms.

Finally, in the case of Uruguay, Elizabeth Bucacos provides different estimates of the natural rate of interest. The main contributions are centered on studying different regimes of monetary policy –first targeting an interest rate, then targeting money aggregates– and distinguishing between short and long term. By defining the long term natural rate as the prevalent interest rate when all the relevant gaps are closed, she calculates a long term natural rate of around 2.5%. Moreover, by estimating a fundamental-based model, the study concludes that aging, productivity growth, sovereign country risk and public indebtedness are all important determinants of the natural interest rate.

3. The international dimension of natural interest rates

The last section is devoted to cross-country analysis. As can be seen in the previous sections, emerging economies, in general, share a common trend in interest rates. This can be confirmed by estimating a common model across countries, as the first paper in this section does, and the global factor can be estimated using this cross-country variation, as it is carried out in the last paper in the book.

In the first paper, Javier G. Gómez-Pineda complements the LW methodology with some additional features, such as an Okun Law, a smoothing parameter for the interest rate gap, an interest rate parity condition and a framework for inflation expectations. He performs this analysis for five Latin American economies –Chile, Peru, Brazil, Mexico and Colombia. The findings point to a drop in the real natural interest rate in Brazil, Mexico and Colombia, and stability in low levels for Peru and Chile.

In the second paper, Estrada *et al.* calculate the common factor of interest rates in a sample of 16 emerging economies, using the Bai-Ng (2004) methodology, in order to find the global component in interest rates of emerging economies. They compare their estimate with a global factor stemming from advanced economies, and provide evidence supporting that both factors share a common trend. As a conclusion, they state that the declining evolution of interest rates in emerging economies can be accounted by the pass-through of low rates in advanced economies.

References

- Bai J. and S. Ng (2004): “A panic attack on unit roots and cointegration” *Econometrica*, N° 72(4), pp. 1127-1177.
- Brunnermeier, Markus K. and Y. Koby (2018). “The reversal interest rate”. *National Bureau of Economic Research*, 2018.
- Del Negro, M., M. P. Giannoni, and F. Schorfheide (2015). “Inflation in the great recession and new Keynesian models”, *American Economic Journal: Macroeconomics*, 7, pp. 168196.
- Galesi, A., G. Nuño and C. Thomas (2017). “The natural interest rate: concept, determinants and implications for monetary policy”, *Economic Bulletin*, no. 1/2017, Banco de España.
- Holston, K., T. Laubach and J. C. Williams (2016). “Measuring the natural rate of interest: International trends and determinants”, *Journal of International Economics*.
- Laubach, T. and J.c. Williams (2003). “Measuring the natural rate of interest”, *Review of Economics and Statistics*, 85, pp. 1063-1070.
- Martinez-Miera, D. and R. Repullo (2019). “Monetary Policy, Macroeprudential Policy, and Financial Stability”. *CEPR Discussion Papers* No. 13530.
- Summers, L. H. (2014). “US economic prospects: Secular stagnation, hysteresis, and the zero lower bound”, *Business Economics*, 49, pp. 65-73.