The persistent and generalised decline in the U. S. interest rates: an alternative interpretation

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13 October 2021

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an alternative interpretation

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Abstract

Interest rates in the USA and in other countries have experienced persistent and generalised declines since the 1980s. The main interpretations of this phenomenon ignore the role of monetary factors, such as financial and monetary policy. The essay proposes an alternative interpretation based on the choice of the Federal Reserve (FED) to conduct monetary policy by attributing high priority to financial-stability. The interaction between changes in financial regulation, the transformation of "specialized" banking into "universal", and the FED's concern with financial instability have led the central bank to add to the role of "lender of last resort" that of "lender of first resort" that systematically provides liquidity at a low cost to financial firms. This new conduct of monetary policy has produced the downward trend in interest rates.

Keywords: interest rates, monetary policy, financial stability, change of financial regulation.

JEL: E43, E44, E52, E11, E12.

1. Introduction

Since the 2007-2008 financial crisis, interest rates have remained at historically low levels. Some benchmark rates have been at nominal values close to zero, while real rates have shown negative values for much of the period. This tendency is the recent representation of a process of decline in interest rates observed since the 1980s.

The phenomenon has captured considerable attention. Most interpretations consider that interest rates are regulated by real factors, such as agent preferences and factor productivity. They assume a downward trend in the *natural* interest rate and sometimes differ among them on the causes of the decline in the natural rate. At the same time, they deny that monetary factors have played any role.

This paper proposes an alternative interpretation based on a monetary theory of the interest rates and suggesting that the FED monetary policy can be called "*financial-stability targeting*" rather than "inflation *targeting*". The paper reviews the FED's annual reports from 1995 to 2007 and finds that the institution has been increasingly concerned more with the stability of the financial system than with inflation. The interplay between changes in financial regulation, the transformation of the banking system from "specialized" to "universal", and the concern about financial instability have led the central bank to add the role of "lender of first resort", which systematically provides financial firms with liquidity at a low cost, to that of "lender of last resort".

Section 2 describes the movements of a set of representative interest rates. Section 3 examines the interpretations of the phenomenon. Section 4 presents some elements underpinning the monetary theory of the interest rate. Section 5 delves into aspects of monetary and financial policy that can influence the levels of monetary variables. Section 6 discusses the FED's reports. Section 7 concludes.

2. The drop in interest rates in the US and in other countries.

Between August and October 1981, benchmark interest rates reached their post-war high (see Figure 1). The federal funds rate (FF) was 19.1%, while 10-year treasury securities (TS10Y) and *Moody's* corporate bond indicators were 15.32%, 15.49% (AAA) and

17.18% (BAA), respectively. Since then, rates have been experiencing a downward trend that has led them to reach historically low levels: while the FF reached 0.05% in 2011 and 2020, long-term bond rates reached 0.62% (TS10Y), 2.14% (AAA) and 3.16% (BAA) during 2020. Some rates like the FF reached near-zero levels since 2009 and have remained at that level until 2021. Rates that did not reach those low levels (like TS10Y, AAA and BAA) have continued their persistent decline. The latest episode of rate increases from 2018-2019 ended up quickly returning to virtually zero levels or continuing the downward trend.

The decreasing tendency in interest rates has been characterized by a marked asymmetric cyclical component: the upward phase in rates has been regularly followed by a downward phase that far exceeds the level gained in the upward period.

Figure 1. Nominal interest rates in the U.S., 1950:01−2021:06
Representative debt instruments. Monthly averages

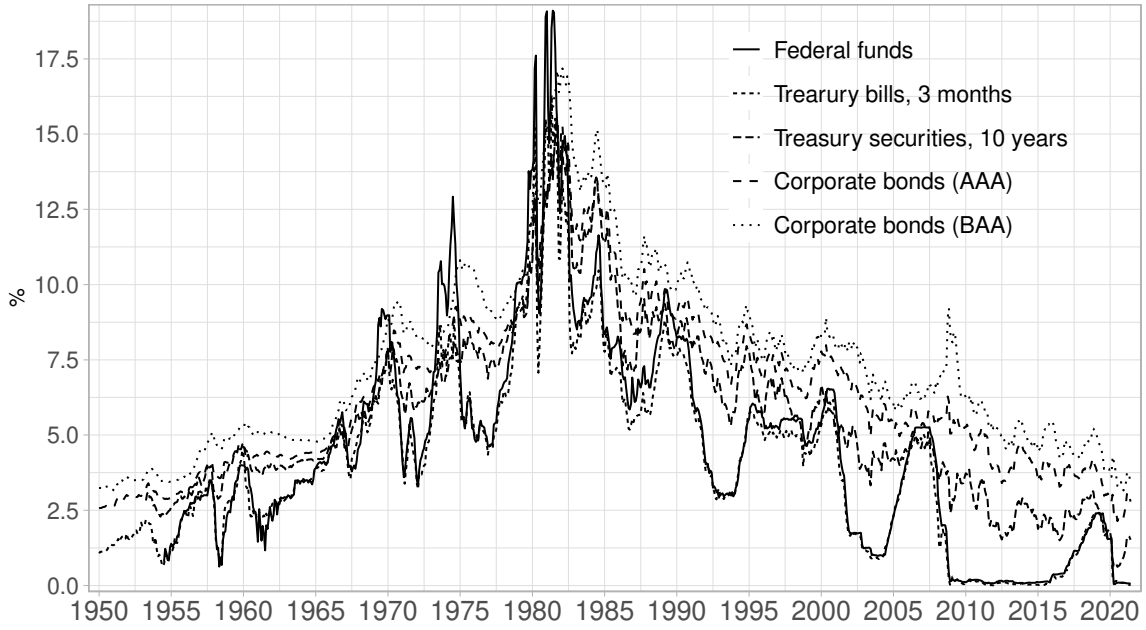


Figure 2 shows that the persistent decline is not exclusive to FF, TS10Y, AAA and BAA. It is a generalized historical trend of the rates of both short- and long-term debt instruments issued by public and private institutions. Plots (a) and (b) in Figure 2 show the interest rates on treasury bills and securities for their different maturity periods. While

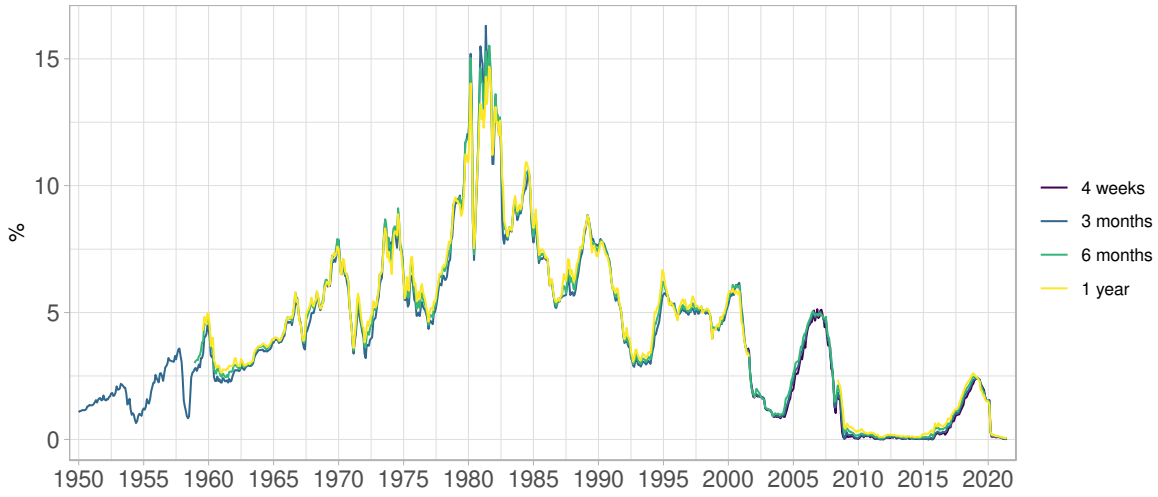
treasury bills rates have similar levels and correlations so strong that it often makes them indistinguishable, treasury securities rates have a strong co-movement, but with a differentiated cycle intensity: in episodes of falls, short-term instruments tend to fall more than long-term instruments and the opposite occurs in episodes of rise. This pattern is also observed for interest rate indicators of high-quality corporate bonds (plot (c) in Figure 2).[1]

During the period 1981-1992 nominal rates recorded a substantial fall. As of December 1987 the FF, TS10Y and AAA reached 6.77%, 8.99% and 10.11%, representing between half and a third of their level in 1981. By December 1992 they had reached 2.92%, 6.77% and 7.98%. A second period of lows was from 1993 to 2008. Figures 1 and 2 allows us to observe that there was a fall in rates before the crisis of 2007-2008. The fall was smaller in magnitude compared to the previous period. This can however be attributed to the fact that the levels reached by these rates in 1993 were not as high as during the monetarist experiment. In December 2008, that is with the crisis already started, the FF, TS10Y and AAA reached 0.16%, 2.42% and 5.05%. The last stage in the downward trend begins in 2009 and is characterized by the persistence at near-zero levels in the rates of short-term instruments and by the downward trend in the rates of longer-term instruments.

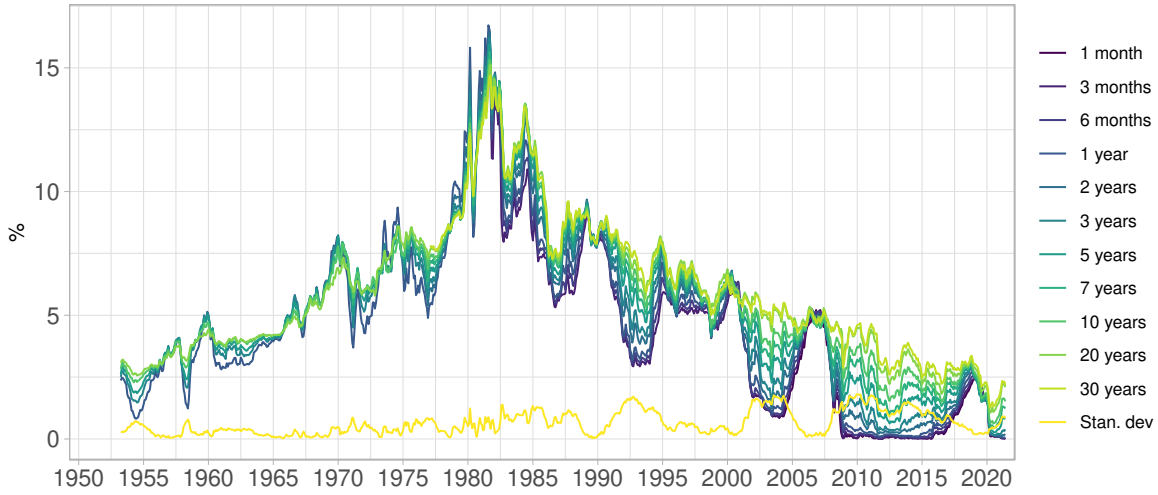
[1] The high quality market (HQM) indicator that the FED constructs estimate the yield of various AAA-, AA-, and A-rated bonds with different maturities as if they were zero-coupon bonds. The series are available only from January 1984.

Figure 2. Nominal interest rates of bills and securities in the U.S.

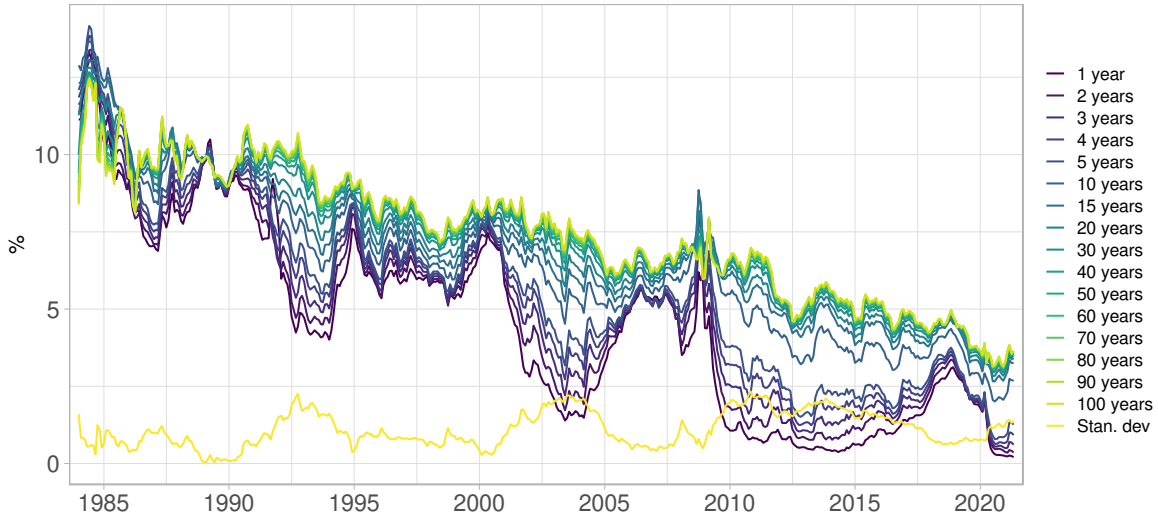
(a) Treasury bills. Monthly averages. 1950:01−2021:06



(b) Treasury securities. Monthly averages. 1953:04−2021:05



(c) Corporate bonds, High Quality Market. 1984:01−2021:05



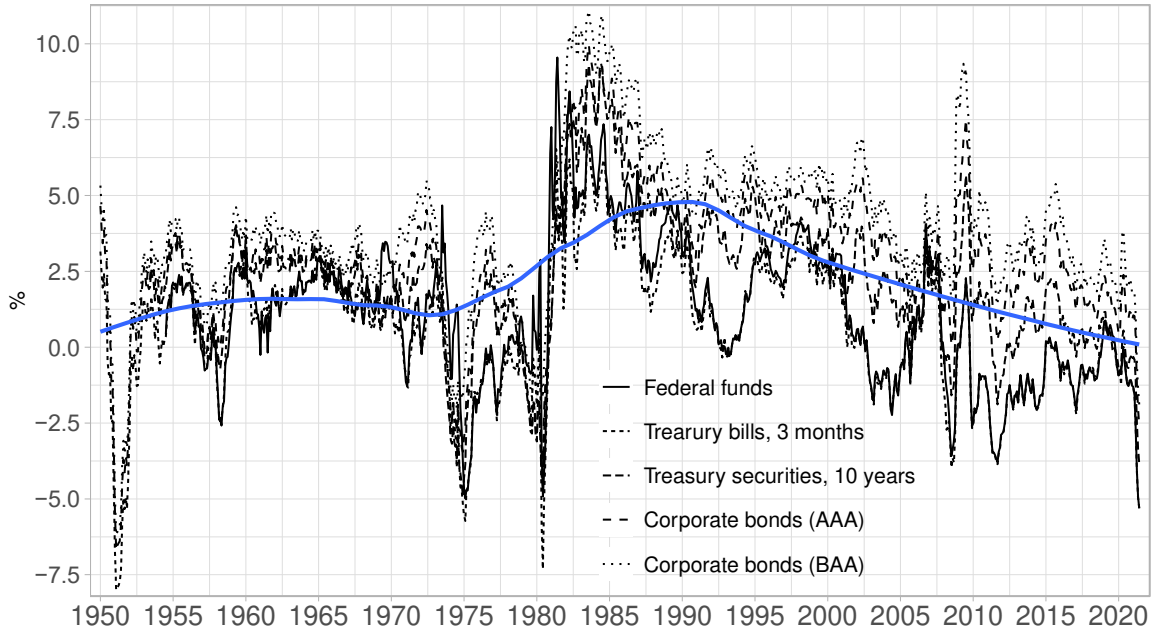
It is relevant to note that the generalized and persistent downward trend in nominal interest rates is preceded by an inverted symmetrical phenomenon: a persistent and generalized rise in nominal interest rates for just over 30 years since the post-war period. In September 1979, a month before the start of the monetarist experiment, the FF, TS10Y and AAA rates were 11.43%, 9.22% and 9.44%, respectively. Then, the 1979-1982-monetarist experiment generated an extraordinary jump in their levels.

An additional factor about the generality in the persistent downward trend in interest rates since the 1980s is that it is also observed for real rates. Some years before 1980 show, however, a different behaviour, which may indicate a restrictive stance of monetary policy. Figure 3 also indicates that at the beginning of the 1950s real rates had recovered from the negative values of the war and were remaining more or less stable until the mid-1970s (see the LOESS trend estimate, blue line).[2] Thereafter, and until the early 1980s, real rates rose, signalling a restrictive phase of monetary policy, which can be related to the monetary authorities' increased concerns about rising inflation and worker-friendly conditions in the labour market, and a prudent stance when the monetarist experiment was abandoned. From then on, there is a downward trend, whose persistence has caused frequent episodes of negative rates to be observed since the 2000s.

[2] LOESS (*locally estimated scatterplot smoothing*) is a smoothing technique based on a non-parametric regression that takes windows from successive data. The alpha parameter provides the degree of softening.

Figure 3. Real interest rates in the U.S., 1950:01−2021:06

Blue line: LOESS tendency. Standard error = gr ay area. Alpha parameter = 0.575

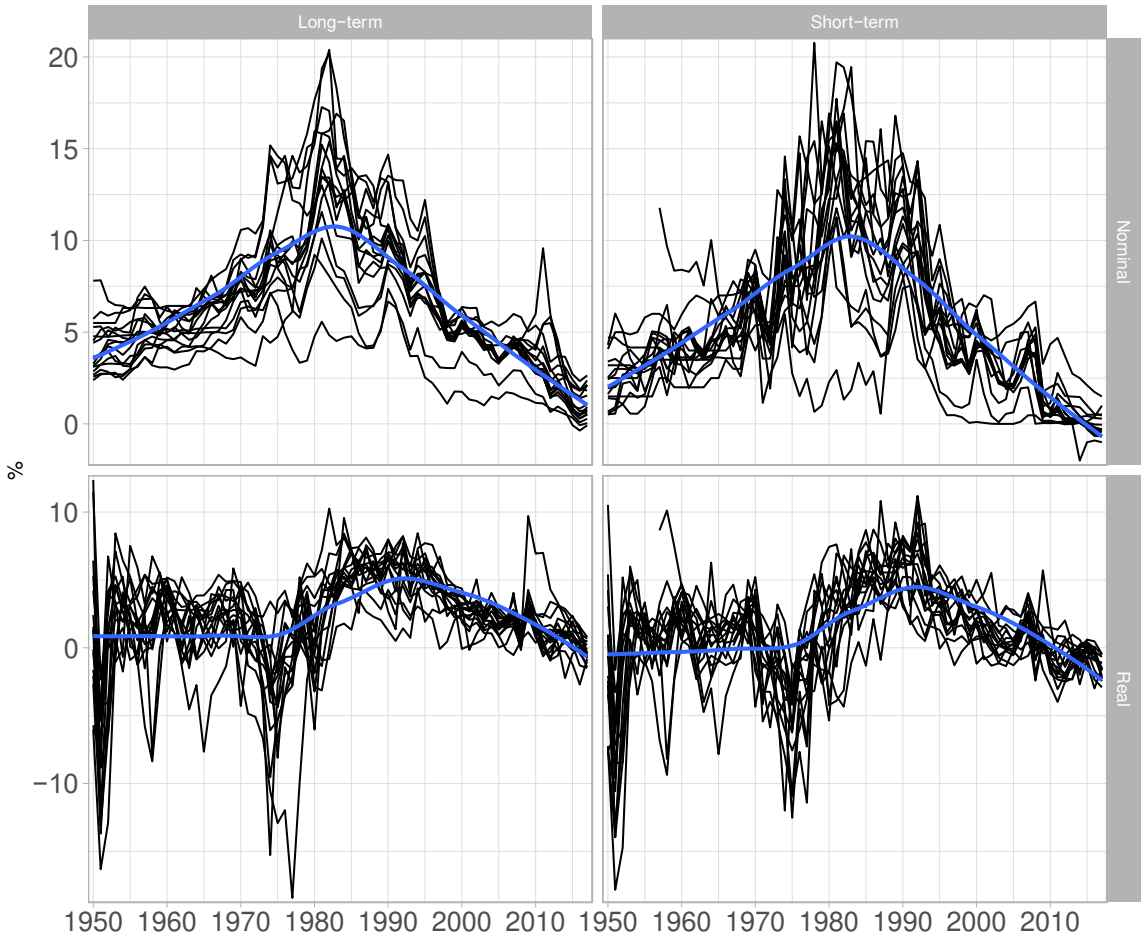


This persistent and generalised decline in nominal and real interest rates can be observed in the US and in other rich countries. Based on data constructed by the *Macro Finance and Macro History Lab* (Jorda *et al.*, 2019), the first row of Figure 4 shows that the representative short- and long-term nominal rates of 16 advanced countries follow a dynamic similar to that of the US.[3] The second row of Figure 4 shows the movements of the real interest rates, defined as nominal interest rates minus the growth rate of the consumer price index. Although for some countries its decline begins in the early or mid-1980s (like in the US), it seems that a generalized fall starts after the peak reached between 1990-1992.

[3] The 16 countries are: Australia, Belgium, Canada, Denmark, France, Germany, Ireland, Italy, Japan, The Netherlands, Norway, Sweden, Switzerland, Spain, the United Kingdom, and the United States.

Figure 4. Interest rates in 16 advanced countries, 1950−2017

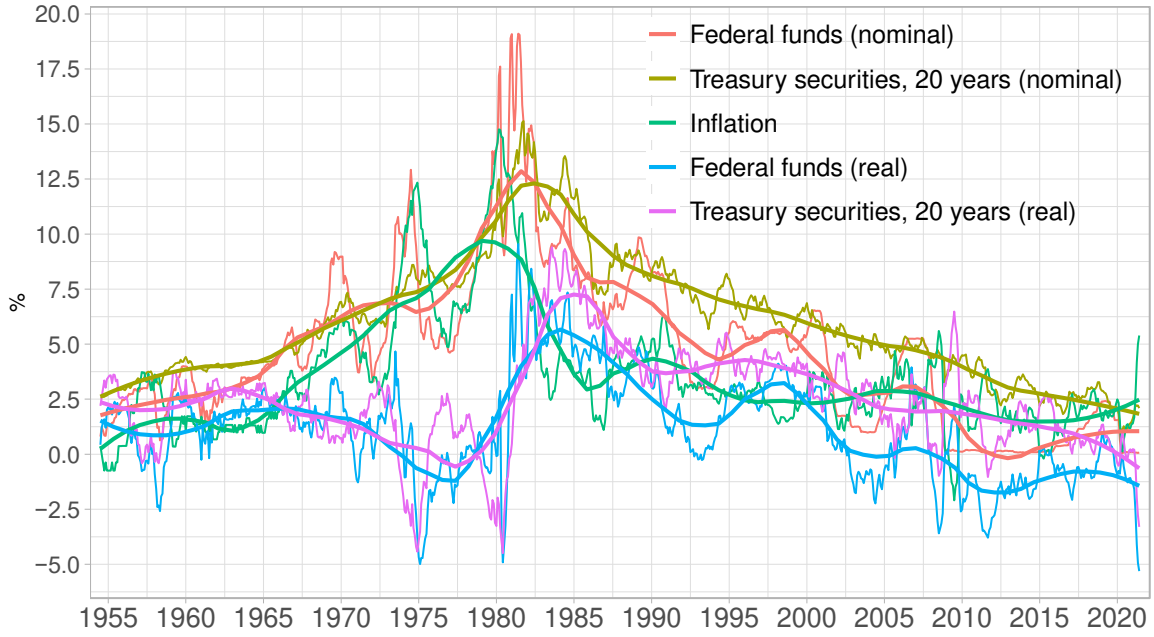
Black lines: country time series. Blue lines: LOESS trend. Standard error : gray area



Finally, Figure 5 shows representative interest rates and inflation for the U.S. and their LOESS trend. It can be seen that the inflation rate began to fall around 1980. Nominal interest rates followed a few years afterwards. Real interest rates began to fall from the mid-1980s, with the short-term real rates maintaining negative levels for most of the sample since mid-2000s.

Figure 5. Interest rates and inflation in the U.S. , 1950:01−2021:06

Time series and LOESS trends. Standard error: gray area. Alpha parameter: 0.22



The facts just described have attracted attention and some interpretations have been proposed. Those prevailing are based on so-called "real factors", related to the marginal productivity of the factors of production. In them monetary elements, like financial and monetary policy, play no role. These interpretations, which we call "real", are in line with the neoclassical theoretical foundations of economic discipline, which accept – as Keynes pointed out when he introduced the concept of "monetary theory of production" – the neutrality of money in long-period analyses, the dichotomy between the "real" and the "monetary" departments of economic theory, and the role of the natural interest rate as a reference point of monetary policy.

It is our position that monetary factors have contributed to the persistent fall in the interest rates. We argue that these factors are related to the phenomenon of the "dominance of finance", fuelled by the change in financial regulation that began to develop in the 1970s. This phenomenon has led the monetary authorities to modify the conduct of their policy to cope with a situation of increasing systemic risks accompanied by low inflation rates, caused by the reduced capacity of the workers' organizations to appropriate the rises in productivity.

3. Interpretations of the decreasing trends of the interest rates

Borio *et al.* (2017, p. 36) discuss the literature on the recent fall in interest rates observing that "real" interpretations prevail. They focus on the concept of natural interest rate, assuming that its variations depend on the saving and investment decisions of the traders and denying that monetary factors and policies play an active role.

The authors begin by citing official documents. (IMF, 2014; Bean et al., 2015; Council of Economic Advisers, 2015). Then, they concentrate on essays that delve into specific aspects of the "real" interpretations. They recall the explanation of Summers (2014; 2015) – known as *secular stagnation* – which gives relevance to the reduction in investment demand due to the kind of technical progress that has prevailed in recent decades. They next mention the interpretation of Bernanke (2005) – known as *saving glut* – which discusses the imbalances in international trade and the consequent increase in saving in some emerging economies, which has been invested in financial assets in the US.[4]

Borio *et al.* (2017) also refer to the interpretation – known as *safe asset shortage* – that focuses on the change in investor preferences, which is due to growing financial instability, towards safe financial assets, such as treasury securities (see Caballero et *al.*, 2008; 2016).[5] Finally, they indicate that some recent "real" interpretations have argued that demographic changes have made labour scarcer than capital, causing a decrease in the marginal product of the latter (see Carvalho et al., 2016; Gagnon et al., 2016; Rachel and Smith, 2017).

According to Borio *et al.* (2017), the value of the aforementioned "real" interpretations depends on the validity of the beliefs inscribed in the neoclassical theoretical foundations of economic discipline:

> A common premise of all the traditional approaches is that real interest rates over long horizons are determined exclusively by real factors. Monetary policy exerts only a transitory influence, which can be entirely ignored (narrative and calibration analysis) or filtered out (filtering analysis). The maintained

[4] On the interpretations of Summers and Bernanke, see also Sandoval and Morales (2017; 2019)

[5] Interpretation *safe asset shortage* suggests that uncertainty linked to financial instability has changed the shape of the "normal yield curve". Borio *et al.* (2017) present it as a variant of the *saving glut*. However, it can also be related to interpretations that indicate the relevance of monetary factors in the fall in interest rates.

> assumption is that monetary policy is neutral in the long run. For example, Del Negro et al (2017, p 1) describes the natural rate as "... the counterfactual rate that would be observed 'in the absence' of monetary policy". Still, in our view, the notion that in a complex monetary economy it is possible to cleanly delineate a "monetary veil" from the underlying real drivers is an exceedingly strong presumption. This presumption has not been sufficiently scrutinised (Borio *et al.*, 2017, p. 6; see also pp. 21 and 26).

The aim of Borio and his colleagues is to analyse, from an empirical point of view, the validity of the presumption that money is neutral in long-period analysis and to question the view that monetary policy is irrelevant when examining the persistent variations of real interest rates. They justify their work by stating that the natural rate of interest is an abstract concept, not directly observable, and that its identification requires that the beliefs inscribed in the neoclassical theoretical foundations cannot be doubted. They recall that some essays demonstrate, from an empirical point of view, the existence of monetary influences on the persistent changes in interest rates (see Galì, 1992; King and Watson, 1997; Rapach, 2003; Rapach and Wohar, 2005; Caporale and Grier, 2005; Neely and Rapach, 2008). Moreover, they clarify that the identification of the natural interest rate represents a formidable challenge for the literature and central banks (see Borio *et al.*, 2017, p. 22). This exercise has been based on two approaches:

> One approach assumes that observed real interest rates roughly track, on average and over long periods, natural rates; it then links their observed decline to potential underlying determinants of saving-investment balances, such as demographic factors or the relative price of capital, mainly through informal inspection or calibrated models. Another approach filters out the natural rate from market rates based on critical assumptions, including the hypothesis that inflation responds stably and systematically to domestic economic slack and that the real interest rate is a key factor influencing aggregate demand. In this paper we have argued that the role of maintained hypotheses in this type of evidence is uncomfortably strong (Borio *et al.*, 2017, p. 36).

To strengthen their standpoint Borio *et al.* (2017, p. 24) point out that monetary factors have influenced the level of economic variables in previous historical epochs. During the

gold standard period (1870-1913), the internal and external convertibility of money – i.e. financial stability – was given the highest priority among monetary policy objectives.[6]

Finally, examining the statistical information of 19 countries since 1870, the analyses of Borio *et al.* (2017) show that persistent variations in real interest rates have gone hand in hand with the predominance of different monetary regimes, which these authors define as "gold or metal standard" (1870-1913), "between wars" (1920-1938), "Bretton Woods" (1945-1971), "prior to Volcker's tightening"(1950-1979), "after Volcker's tightening" (1980-2016), "inflation *targeting"* (1991-2016). These results confirm, according to them, the relevance of monetary factors.

The following sections highlight the role that monetary and financial factors can have had in affecting the persistent variations of the interest rates by focussing on the FED's growing concern about instability, caused by the change in the dominant approach to financial regulation and the consequent transformation of "specialized" into "universal" banking. Borio *et al.* (2017) point out that financial stability – and not inflation or the level of output of the economy – was given the highest priority among the objectives of monetary policy during the monetary regime called the "gold or metal standard" (1870-1913). The analysis we present in the following sections indicates that the Federal Reserve has attributed to financial stability the highest priority among its objectives since mid-1990s. This choice thus predates the crisis of 2007-2008.

Our conclusion is in line with Keynes' standpoint in the General *Theory*. It attributes the determination of interest rates to the action of central banks – considered as dependent on what the authorities consider most convenient under the prevailing historical conditions, rather than dependent on the knowledge of the natural rate – and to the credibility that operators attribute to these institutions.

[6] Borio *et al.* (2017, p. 24) state: 'The gold standard regime provides prima facie evidence that the role of monetary factors may well have been underestimated. During this regime, central banks did not target inflation or output directly; rather, they targeted convertibility – internal and external (e.g. Wicksell (1906))'.

4. Theoretical elements for a monetary interpretation of the decline in the interest rate

The "real" interpretations of the decreasing trends in the interest rates follow the neoclassical tradition that these rates depend on the demand for and the supply of the productive factor "capital".[7] In the economic literature, however, alternative theories have been proposed. In them the interest rate also depends on monetary factors linked to the institutional organization of financial markets and monetary policy.

The best-known development of a monetary theory of the interest rate can be found in Keynes' *General Theory*, which rejects the theoretical contents of the *Treatise on Money,* published in 1930. Denying the validity of the neutrality of money in long-period analyses, the dichotomy between the "real" and "monetary" departments of economic theory, and the use of the natural rate as a guide in the conduct of monetary policy, the *General Theory* attempted to modify the theoretical foundations of economic discipline by introducing a "monetary theory production and distribution". It argued that the "average" or "durable" interest rate, that is, the one that tends to prevail and around which the market interest rate fluctuates, depends on central bank's decisions regarding the interest rate that is convenient to stabilize.[8]

In the *Treatise on Money* Keynes had argued, in line with the neoclassical tradition, that central banks tend to stabilize the natural rate of interest, determined by the "real" department of economic theory as the marginal product of the last unit of capital available in the economy and employed in the productive process. In the *General Theory* and in its preparatory writings Keynes had rejected the use of the natural rate, considering it an abstract concept – not directly observable – that inhibits the correct interpretation of the behaviour of the economy and the application of effective policy solutions.

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[7] Traditionally, central banks have acted on a short-term monetary interest rate. However, the interest rate that is relevant for decisions on fixed capital investment is the long-term one. For this reason, the natural rate must be considered long-term. This implies that central banks can count on the existence of a positive relationship between short-term and long-term rates. Doubting the validity of this relationship during periods of crisis, Keynes proposed that the open market operations of central banks should act on both short and long term assets (see Panico, 2008). Recent unconventional monetary policies have operated on the entire structure of interest rates with the aim of having a greater influence on fixed capital investment (see Friedman, 2014).

[8] Keynes (1936, p. 203) states: '*Any* level of interest which is accepted with sufficient conviction as *likely* to be durable, *will be durable*; subject, of course, in a changing society, to fluctuations for all kinds of reasons round the expected norm'.

In his alternative proposal of the theoretical foundations of the discipline, the primary elements for interpreting trend movements in interest rates are the decisions of central banks and the reputation that operators attribute to these institutions. The decisions of central banks on the interest rate to be stabilized, according to the General *Theory,* are the result of the evaluation of what these institutions consider most convenient under the prevailing historical conditions. To take these decisions, the monetary authorities may consider various elements, such as:

1. the state of the economy,
2. the prevailing inflation and unemployment rates,
3. the current account of the balance of payments,
4. the refinancing needs of the national financial industry, the country's other industries and the public sector,
5. the level of systemic risk that the existing institutional organization of financial markets tends to generate,
6. the relationships between the national and international financial systems and the likelihood of capital movements and alarming changes in the exchange rate.

The presence of the latter elements in the above list indicates that monetary policy decisions do not depend only on the inflation and output gaps and the state of the current account of the balance of payments. They also depend on the assessment of the degree of systemic risk in which the financial sector operates and on the possibility that the financial and capital accounts of the balance of payments suffer from mechanisms of instability related to capital movements. The presence of these elements reflects the authorities' concern about financial stability and may induce a tendency (conscious or unconscious) of monetary policy to stabilize interest rates that tend to be lower over time.

5. Change in financial regulation and the role of "lender of first resort"

The contrast between the stability that characterized the behaviour of economies during the Bretton Woods era and what has happened in the following years has drawn the attention of some economists engaged in the study of evolution of financial regulation

after the crisis of 1929 and the Second World War. Eugene White published in 2009 an essay on the change of approach that has characterized this aspect of monetary policy.

White contrasts two approaches to financial regulation, one focused on the discretionary power of authorities over the managers of financial firms and another focused on the use of pre-established rules on the capital requirements. The first approach dominated in what White calls the "New Deal or Bretton Woods era", that is, from the 1930s to the early 1970s, a period in which economies benefited from a high degree of financial stability.[9] The second approach dominated during what White calls the "contemporary era" (1991-2008) which, according to him, begins after a period of transition, which he calls "post-New Deal era" (1971-1990), during which changes were made that allowed the gradual shift from one approach to another.

One of the main consequences of the shift in focus on financial regulation in the US has been the transformation of the "specialized" banking system of the "New Deal or Bretton Woods era" into the "mixed" or "universal" system we have had since the 1990s.

The "specialized" system was developed in the United Kingdom in the XIX century. There were commercial banks, discount houses, building societies, etc. Each type of bank was required to operate a limited set of assets and liabilities, selected so that the maturity of the former was no different from the maturity of the latter. Thus, commercial banks and discount houses could only hold short-term liabilities and make short-term loans, while mortgage and investment banks could only take out medium- and long-term liabilities and make loans with the same type of maturity. These restrictions allowed lending firms to have a balanced asset and liability structure. In this situation the role of lender of last resort, which the Bank of England gradually assumed over several systemic crises and which was fully recognized after the crisis of 1866 and the publication of Bagehot's *Lombard Street* (1873), was sufficient to avoid further bank runs and financial crises. Throughout the XIX century the Bank of England had maintained a discount window for lending firms. The window had operated based on discretionary decisions of the Bank, linked to the evaluation of the profitability of the credit granted. Definitively

[9] Commenting on the graphs describing the number of bank crises, White (2009, p. 39) states that in that period they disappeared from the radar.

assuming since the 1870s the function of lender of last resort, the Bank undertook to grant credit to banks, without delay, even when there was no positive evaluation of the profitability of the credit granted. Despite being a private entity, the Bank formally assumed a public function, ensuring the refinancing of banks in emergency situations, that is, when the credit system was on the verge of a systemic crisis and it was not convenient for a private bank to grant credit.

In the second half of the XIX century, another type of credit system was developed in Germany for the first time in history. It focused on "mixed" banking – today it would be called "universal" – and not on "specialized" banking. German credit companies could hold assets and liabilities with different maturities. They were able to raise short-term resources and provide short- and long-term loans, which made the maturity structure of their financial assets and liabilities unbalanced.

The decision to have a mixed or universal system, and not to operate with the specialized banking born in the United Kingdom, was taken by the German political authorities after the unification of the country in 1871 and was not the result of a spontaneous development of market forces. With respect to the United Kingdom, Germany experienced a late economic development and to make up for it, the authorities took the decision to involve credit companies directly in the country's industrialization policy. To make effective the channelling of financial resources to the productive sectors selected by the industrial policy, banks were involved in the formation and expansion of the industrial companies. They had to grant them long-term loans and favour the placement of their shares through direct interventions in the process of issuance and qualification.

The unbalanced structure of assets and liabilities made the participation of credit firms in industrial policy risky. To reduce the risks, the *Reichsbank,* the equivalent of the Bank of England in Germany, took on the task of intervening by systematically refinancing the mixed banks that were complying with government policy directions. With these systematic interventions the *Reichsbank* assumed the role of lender of first resort in addition to that of the lender of last resort. Instead of providing means of payment in

emergency situations, as the Bank of England did, it provided means of payment at low cost to the banks on a daily basis to avoid that they could be in situations of illiquidity.[10]

The transformation of the US specialized system into universal, caused by the change of approach to financial regulation after the rupture of the Bretton Woods Agreements, can be considered the element that has imposed a change in the conduct of monetary policy. It has forced the FED to play the role of lender of first resource, in addition to that of lender of last resort (see de Cecco, 1999). To reduce the likelihood of increased systemic risk and financial crises, the FED has had to systematically provide low-cost liquidity to universal banks.

In a context of low and stable inflation, due to the limited capacity of workers to appropriate the rises in productivity, the FED has gradually shifted the focus of its attention towards the control of systemic risk since the 1990s. The tendency of universal banks to generate rising risks and instability, the increasing number of financial crises in different countries of the world (see Laeven and Valencia, 2008; 2018), the ascending international role of the dollar, and the effects of the crises on the exchange rate have induced the FED to change the conduct of monetary policy. Although the FED has continued to react, particularly before the 2007-2008 crisis, to the inflation and output gap, concerns about the higher levels of systemic risk have been increasingly expressed in its Reports and in the minutes of its governing bodies. These concerns have induced the central bank to cut interest rates with greater intensity during recessionary times and when there were signs of financial instability. The crisis of 2007-2008 strengthened this trend, inducing the introduction of unconventional monetary policies that have brought interest rates close to historically low levels.

Similar events to those regarding the US can be mentioned when studying the downward trends in interest rates in other countries. There too, the decreasing tendencies can be seen as the result of the transformations that have occurred in regulation, in the financial

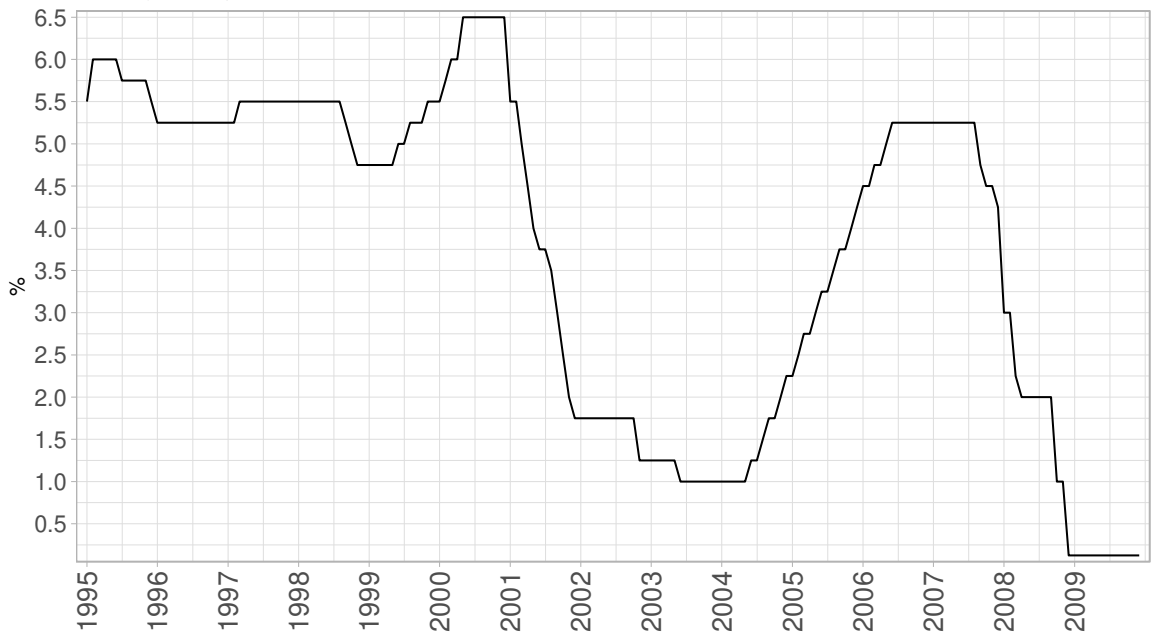
[10] An analysis of the differences between the specialized credit system of the United Kingdom and the mixed system of Germany can be found in the manuscript of the course on "Continental Banking" that Sraffa taught in Cambridge from 1929 to 1931. De Cecco (1999; 2005) and Panico (2021) describe the content of this manuscript, which highlights the need to have a central bank that plays the role of lender of first and last resort in a mixed or universal credit systems.

systems, and in the consequent decisions of monetary policy to pay increasing attention to financial stability.

6. Analysis of the FED's Annual Reports: "inflation targeting" or "financial stability targeting"?

The analysis of the Reports of the Federal Reserve presented before the crisis of 2007-2008 can support the view that since the second half of the 1990s the main concern of the authorities has been changing toward the control of financial stability. Figure 6 describes the movements of the intended FF since 1995. It can help the reader to follow the account of the interest rate policy presented in this section.

Figure 6. Federal Open Market Committee's target federal funds rate



In the first half of the 1990s the Federal Reserve was still primarily committed to offset the inflation and the output gaps of the economy. In the first quarter of 1995 the Federal Open Market Committee (FOMC) raised the intended FF ½ percentage point, driving it up to 6 per cent 'to reduce the risk that inflation might mount, with the attendant threat to

continued economic expansion' (FED, 1995, p. 3). The data released in spring, however, showed that inflationary pressures were receding. Monetary policy so eased in the second half of the year, contributing to the decline in short-term market interest rates, which by year-end were about 1 to 2 percentage points down from the peaks reached early in 1995.

The Report of that year highlights that inflation and inflation expectations were more subdued than had been anticipated (FED, 1995, p. 22). A large part of the Report examines the stability of the financial system. It comments on the failure of an Orange County's investment fund and the subsequent bankruptcy of the county itself (FED, 1995, p. 59), the failure of Barings PLC, and the serious losses at the U.S. offices of Daiwa Bank (FED, 1995, p. 231). The Report also highlights the aggressive lending attitude of financial intermediaries (FED, 1995, pp. 36; 85) and the increased use of "securisation" and other innovative procedures, which favoured the household and business sectors' access to credit (FED, 1995, pp. 23-24; 43; 84). Finally, it recalls that some indicators, like the average household debt service burden and the delinquency rates on credit card debt held by banks and on auto loans booked at captive finance companies, already provided evidence that some households were beginning to experience increased pressures (FED, 1995, pp. 23-24). The Office of the Comptroller of the Currency and the FED, while acknowledging that the situation did not require stricter measures, took actions to induce banks to have a more prudent approach (FED, 1995, pp. 86 and 231).

Similar elements can be found in the 1996 Report. Despite remarkable GDP growth (FED, 1996, p. 3), core inflation remained constant, or even declining, on account of the weak rise in wages due to workers' concerns about job security (FED, 1996, pp. 3-4).

The Report again devotes many pages to financial stability. The main concern is the strong appetite of financial institutions for expanding their business without paying attention to the associated risks (FED, 1996, pp. 4-5). The Report mentions that finance companies and banks briskly moved into the ''subprime'' equity loan market, lending either to higher-risk customers or on terms entailing unusually high loan-to-value ratios, or both (FED, 1996, pp. 3, 19, 23-24).

Consumer credit was also securitised at a brisk pace. For the FED (1996, p. 23; see also pp. 76 and 118), 'the credit-scoring models most banks use to evaluate consumer lending

decisions have tended to be too optimistic'. The Report finally highlights that debt problems of the household sector arose with increasing frequency (FED, 1996, pp. 14, 17, 23, 76, 118). The minutes of the Monetary Policy Committee show that these difficulties induced two members to ask for more accommodative policy conditions (FED, 1996, p. 118).

The 1997 and 1998 Reports confirm that the performance of the US economy was excellent in spite of the waves of financial instability that affected the world economy and the domestic financial system. Growth was vigorous, the unemployment rate declined to its lowest level in nearly a quarter-century, and inflation slowed further due to the flexibility of the labour markets, particularly in the goods-producing industries (FED, 1997, pp. 3-4, 7, 16, 34; 54-55, 106, 110-111, 120-121; 1998, pp. 3, 5, 9, 39, 65).

The events that mainly characterised these two years were the waves of financial instability that affected the Asian and Latin American economies and some US financial firms. International markets were dominated by the crisis that begun in Thailand in summer 1997. Its effects spread to 'Korea, Indonesia, Malaysia, Singapore, the Philippines, and Hong Kong in late 1997 and the first part of 1998 to Russia in the summer, and to Latin America, particularly Brazil, shortly thereafter' (Fed, 1998, p. 32). Several nonfinancial and financial firms had to cope with the losses generated by the distress and encountered problems servicing their obligations, which, in many cases, were denominated in dollars (Fed, 1997, p. 4; 1998, p. 23). The distress affected the value of the dollar and imposed adjustments in the US economy and changes in the interest rate policy (FED, 1997, pp. 5, 104; 1998, pp. 3-4, 6-7, 9, 26, 40-41, 179, 184, 189, 200).

The review of the interest rate decisions taken by the Federal Reserve during this period allows one to compare the influence of the inflationary pressures and of financial instability on them. Inflationary pressures induced the FOMC to raise the intended FF from 5 ¼ to 5 ½ per cent in March 1997 (FED, 1997, pp. 3-4 and 55). This was the only upward movement over the two years. On the contrary, the preoccupation raised by financial instability led to several downward movements. In September 1998 the FOMC, 'looking beyond incoming data suggesting that the economy was continuing to expand at a robust pace, lowered the intended level of the federal funds rate ¼ percentage point'

(FED, 1998, p. 6). On account of the further deterioration of liquidity conditions in domestic and international financial markets, on October 15, Chairman Greenspan took the initiative to organise an extraordinary conference call with the FOMC members. As a result of this call, the intended FF was trimmed another ¼ percentage point reaching 5%. At the same time the Board of Governors approved a ¼ percentage point reduction in the discount rate (FED, 1998, pp. 7, 184-189). The persistence of downside risks in financial markets then induced the FOMC to reduce the intended FF a further ¼ percentage point at its November meeting. At the same time, the Board of Governors approved a reduction of another ¼ percentage point in the discount rate, moving it from 5 per cent to 4 ¾ per cent (FED, 1998, pp. 7, 189, 200). Both decisions were taken to prevent the tightening of credit markets (FED, 1998, p. 9).

The analysis of the 1997 and 1998 Reports shows that the concern of the Federal Reserve about financial instability was also caused by the crisis of Long-Term Capital Management (FED, 1998, pp. 24-25) – a major national hedge fund having as principal shareholders Merton ad Scholes, who won the Nobel Prize in 1997 for their contribution to the evaluation of the value of derivatives – and by the persistence of risky behaviours of the managers of financial firms. The Reports confirm the concerns about the appetite of financial institutions for expanding their business (FED, 1997, pp. 10-11, 18, 62, 74, 109; 1998, pp. 4, 10-11) and with the persistent tendency towards enlarging the subprime equity loan market (FED, 1997, pp. 8, 12, 35, 46-47; 1998, pp. 12), evaluating these decisions on the basis of credit-scoring models that were too optimistic (FED, 1997, pp. 10-11), and increasing debt repayment problems in the household sector (FED, 1997, pp. 9, 47, 61, 62; 1998, p. 11).

The analysis of these elements allows one to conclude that financial instability, more than inflationary pressures, guided the decisions of the authorities in 1997 and 1998. They frequently recalled that inflation could be sprung up by robust economic growth. However, they had to admit that expectations did not materialise and raised the intended FF from 5 ¼ to 5 ½ per cent in March 1997. Then, owing to their concern about financial instability, they lowered it several times bringing it to 4 ¾ per cent.

Over the next two years the Federal Reserve's concern about inflation returned to have a primary role in interest rates decisions. The 1999 and 2000 Reports point out that in the final parts of 1998 the financial instability of the previous months faded (FED, 1999, p. 3), while the growth of the economy was again defined 'exceptional' and was accompanied by striking moderate inflation (FED, 1999, p. 3; 2000, p. 3).

The Reports signal that the authorities reversed the interest rate policy pursued until autumn 1998, fearing that the risk of pressures on costs and prices could materialise because the labour market was at its tightest in three decades (FED, 1999, pp. 3-4). The FOMC raised the intended level of FF ¼ percentage point in June 1999 and in August it raised this rate a further ¼ percentage point, driving it to 5 ¼ per cent. In a related action, the Board of Governor increased the discount rate to 4 ¾ per cent (FED, 1999, p. 4). The persistent perception of a significant risk that inflation would peak up over time led the FOMC to raise the target for FF an additional ¼ percentage point in November 1999 and the Board of Governors to approve an increase in the discount rate of ¼ percentage point, driving it to 5 per cent.

In February and March 2000 the FOMC again tightened monetary policy, raising the target for the overnight FF ¼ percentage point on each occasion. Similarly, the Board of Governors again approved quarter-point increases in the discount rate in both February and March. Moreover, in May the FOMC and the Board of Governor raised the intended FF and the discount rate another ½ percentage point (FED, 2000, p. 3). The former thus reached 6 ½ per cent.

The Reports also point out that the loans to households and businesses slowed in 1999. The indicators of debt repayments, like personal bankruptcies and the delinquency rates on home mortgages, credit cards auto loans, were also declining (FED, 1999, p. 9). On the contrary, borrowing increased at a brisk pace in 2000 and again lenders did not appear to be significantly concerned about the credit quality of the household sector for most of the year (FED, 2000, p. 9). Consequently, the indicators of the ability of debt repayments worsened again, although moderately. Between October 1999 and April 2000, the authorities decided to provide sound depository institutions with unrestricted access to the

discount window, at a penalty rate, in order to relieve the problems of liquidity of the financial institutions (FED, 1999, p. 5).

The economic and financial situation changed again by the end of 2000 (FED, 2000, p. 5; 2001, p. 3). The authorities reacted aggressively, starting with a telephone conference call on January 3, 2001, when the FOMC decided to cut the intended FF ½ percentage point. This decision was followed, a few days after, by the Board of Governors' approval of a ½ percentage point cut in the discount rate.

Other extensive cuts were decided in the first half of 2001 to support consumer spending and the housing sector. In five half-point steps the cumulative reduction in the FF reached 2 ½ percentage points by May. In June and August the FOMC opted for smaller interest rate cuts of ¼ point at each meeting. These actions brought the target FF down to 3 ½ per cent. On the other hand, the Board of Governors approved reductions in the discount rate that matched the cuts in the target FF. As a result, the discount rate declined from 6 per cent to 3 per cent over the same period (FED, 2001, pp. 3, 7, 8).

The previous analysis indicates that, already before the events of September 2001, the fall in the intended FF and in the discount rate had been larger than the rise occurred in 1999 and 2000. What happened in September further affected the economy, increasing uncertainty in financial markets. Equity prices fell sharply for several weeks and credit risk spreads widened considerably, leading the Federal Reserve to issue massive amounts of liquidity to limit disruptions in those markets (FED, 2001, p. 3).

On September 17, during a telephone conference call, the FOMC reduced the intended FF ½ percentage point, leading it to 3 per cent (FED, 2001, pp. 8 and 277). In the subsequent weeks, the FOMC was facing the perspective that this measure had been insufficient and in October and November decided to further reduce the intended FF ½ percentage point each time, leading the rate to 2 per cent (FED, 2001, p. 8). In December the FOMC again lowered the intended FF ¼ percentage point, leading it to 1 ¾ per cent. As had occurred in previous occasions the Board of Governors approved reductions of the discount rate that matched those of the FOMC bringing the discount rate to 1 ¼ per cent, the lowest level since 1948 (FED, 2001, p. 9).

The authorities' concern about the instability that had been affecting the US economy in previous years is expressed by two opening sentences of the 2002 Report, which highlight the connexion between financial markets' distress, political events and unlawful behaviour of corporations. The first states:

> The economy of the United States has suffered a series of blows in the past few years, including the fall in equity market values that began in 2000, cutbacks in capital spending in 2001, the horrific terrorist attacks of September 11, the emergence of disturbing evidence of corporate malfeasance, and an escalation of geopolitical risks. Despite these adversities, the nation's economy emerged from its downturn in 2001 to post moderate economic growth last year (FED, 2002, p. 3).

The second, centred on the negative reactions of skittish financial markets, claims:

> In financial markets, investors and lenders had apparently become more risk averse in reaction to the mixed tone of economic data releases, growing geopolitical tensions, further warnings about terrorist attacks, and additional revelations of dubious corporate accounting practices. In concert, these developments pushed down yields on longer-term Treasury securities, while interest rates on lower-quality corporate bonds rose notably, and equity prices dropped sharply. (FED, 2002, p. 6).

The persistence of these conditions led the FOMC in August 2002 to forecast economic weakness as the most probable outcome and to reduce in November the intended FF 50 basis points, to 1 ¼ per cent, (see FED, 2002, pp. 4 and 6-7).

In 2003 the US economy gathered strength while unit labour costs continued to decline and price inflation remained low (FED, 2003, p. 3). In June, although the FOMC had seen signs of improvement in some sectors of the economy, it considered that there was no concrete evidence of an appreciable overall economic expansion and that the economy excess capacity was likely to keep inflation in check. For this reason, it decided to lower the target for FF ¼ percentage point, to 1 per cent, to add support to economic expansion and as a form of insurance against a further substantial drop in inflation (FED, 2003, pp. 6, 9 and 25-26).

In the second half of the year, however, real GDP increased at an annual rate of 6 per cent (FED, 2003, p. 9). Growth was accompanied by a marked increase in household debt due

in large part to the surge in mortgage borrowing induced by record-low mortgage interest rates (FED, 2003, p. 12). The low interest rates also spurred considerable corporate bond issuance, while equity markets started to rally (FED, 2003, p. 10).

From 2004 to July 2007 the US economy gained strength (FED, 2004, p. 3; 2005, p. 3; 2006, p. 3) while inflation remained low (FED, 2004, p. 3; 2005, p. 3; 2006, pp. 3 and 9; 2007, pp. 3-4).

In June 2004 the FOMC began to reduce the substantial degree of monetary accommodation that was in place. It raised the intended FF to 1 ¼ per cent and conveyed the view that, given the economic outlook, the monetary stimulus would be soon removed so that policy could return toward what it defined "a more neutral stance".

In August and September it raised it again to 1 ½ and to 1 ¾ per cent (FED, 2004, p. 6). In November and December, judging that the economy was growing at a satisfactory pace and that inflationary pressures would be contained if monetary policy accommodation were gradually withdrawn, the FOMC raised the intended FF to 2 and 2 ¼ per cent (FED, 2004, pp. 6 and 7).

The 2004 Report indicates that the FOMC considered that the support that low rates gave to consumption was the factor that mainly contributed to growth. It also shows that the authorities considered the indicators of debt repayments acceptable, although they were generally worse than those recorded in previous years.

In 2005 the FOMC continued to remove monetary policy accommodation by raising the intended FF 25 basis points at each of its eight meetings. The rate thus cumulatively rose 2 percentage points, reaching 4 ¼ per cent (FED, 2005, pp. 3-4). The FOMC considered that this level was 'within the broad range of values that … might turn to be consistent with output remaining close to its potential' (FED, 2005, p. 6). Then, in January 2006 it raised the rate another 25 basis point driving it up to 4 ½ per cent. Finally, in each of the January, March, May and June meetings, the FOMC raised the intended FF other 25 basis points, bringing it to 5 ¼ per cent. These actions show that during this period the members of the Committee held some concern about inflationary pressures (FED, 2005, pp. 24-25).

Meanwhile, the stability of the financial system was increasingly at risk. Levine (2010), Barth, Li, Lu, Phumiwasana and Yago (2009), Caprio (2009), Barth, Caprio and Levine (2011) argue that the Federal Reserve was more aware of these problems than it was available to acknowledge in public statements and documents. By using evidence from official documents and archives, these authors contend that the changes in financial regulation, which occurred after the Bretton Woods era, had impaired the governance of this activity and that the central bank was aware that the new approach to financial regulation was producing distortion of the flows of credit towards questionable ends since 2003. Moreover, they claim that the Federal Reserve went so far as to provide the Congress with false information on this matter and conclude that it is necessary to strengthen the independence of the authorities from the pressures of the financial industry in order to correct the governance of regulation.

Despite these potential reserves, the 2006 Report indicates that 'following up on a meeting with the Federal Reserve Bank of New York in the fall of 2005, the largest participants in the fast-growing market for credit derivatives agreed to a series of steps to strengthen that market's infrastructure' (FED, 2006, p. 29). It also refers to the increase of volatility of the US equity markets, foreign exchange and fixed-income markets in several emerging economies (FED, 2006, p. 28). In addition, it mentions the liquidation of some sizable hedge funds, which occurred during the year, adding that they were not affecting the broad functioning of the markets (FED, 2006, p. 28). Finally, it points out that the rise in interest rates contributed to higher debt service payments, pushing the household financial obligation ratio up to a 'record high' and markedly raising the delinquency rate on consumer loans and on most types of mortgages with variable interest rates (FED, 2006, pp. 4 and 13), Nonetheless, the Report highlighted that 'at the beginning of 2007, households' balance sheets appeared to be in good shape' (FED, 2006, p. 3).

On the 9th of August 2007, at the opening of the markets in New York, the crisis blew up following the declaration of four European financial firms that they were facing severe problems in the derivative markets. This news produced a sharp rise in the short-term interest rates in the interbank markets, which damaged the working of the transmission mechanism of monetary policy. The 2007 Report claims that the crisis was triggered by a

sharp increase in delinquencies and defaults on subprime mortgages, which impaired the functioning of the secondary markets for subprime and non-traditional residential mortgages. The Report so describes the main elements of the crisis:

> After midyear, as losses on subprime mortgages … continued to mount, investors became increasingly sceptical about the likely credit performance of even highly rated securities backed by such mortgages. The loss of confidence reduced investors' overall willingness to bear risk … That reassessment was accompanied by high volatility and diminished liquidity in a number of financial markets here and abroad. The pressures in financial markets were reinforced by banks' concerns about actual and potential credit losses. In addition, banks recognized that they might need to take a large volume of assets onto their balance sheets—including leveraged loans, some types of mortgages, and assets relating to asset-backed commercial paper programs—given their existing commitments to customers and the increased resistance of investors to purchasing some securitized products. In response to those unexpected strains, banks became more conservative in deploying their liquidity and balance sheet capacity, leading to tighter credit conditions for some businesses and households. The … reassessment of risk by investors precipitated … a sizable net decline in equity prices (FED, 2007, pp. 3-4).

The Federal Reserve reacted to these events by conducting unusually large open market operations, adjusting the procedures for discount window borrowing and securities lending, supplying short-term credit to banks against a large variety of collateral, and organising currency swap arrangements with other central banks to increase the availability of term dollar funds in their jurisdictions (FED, 2007, p. 4). Finally, the FOMC cut the intended FF 50 basis points in September, adding two other cut of 25 basis points in October and December. Owing to the further deterioration of the economic and financial situation, the FOMC cut another 125 basis points in January 2008, of which 75 basis points were cut on January 22 and 50 basis points during the meeting scheduled on January 29-30. These reductions paved the road towards the "zero bound".

To sum up, the Reports indicate that the Federal Reserve became increasingly concerned about the stability of the financial system before the crisis of 2007. The central bank did not disregard inflation and output gaps. Yet, since inflationary pressures were contained and the financial system showed increasing signs of volatility, they made the interest rate policy more and more sensible to instability problems. The reductions in the policy rates

were larger than the increases and the overall result was a tendency toward lower interest rates, which reached the “zero bound” after the crisis of 2007.

7. Conclusions

The recent fall in interest rates can be interpreted by making reference to the "real" or to the "monetary" theoretical foundations of economic discipline. Borio *et al*. (2017) have argued that prevailing "real” interpretations show some limits that lead to deepening the role that monetary and financial policy has had in the downward trend of interest rates.

In this essay we have tried to identify some theoretical and institutional elements favouring the adoption of a monetary interpretation of this phenomenon. We have examined the Reports of the Federal Reserve to argue that since mid-1990s, i.e. already before the crisis of 2007-2008, this institution has been worrying more for the growing instability and the need to provide financial resources at low cost to financial companies than for inflation. This change of attitude has generated the downward trend of the interest rates, which reached the "zero limit" after the 2007-2008 crisis.

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