BANCA D'ITALIA
EUROSISTEMA

A Monetary History of the United States, 1867-1960
by Milton Friedman and Anna Jacobson Schwarz

Speech by Luigi Federico Signorini,
Senior Deputy Governor of the Bank of Italy[1]

Istituto Bruno Leoni
Rome, 17 October 2022

I would like to thank Professor Alberto Mingardi and the Istituto Bruno Leoni for their kind invitation. Milton Friedman is one of the giants of 20th-century economics, and the book he wrote with Anna Schwartz has been commented upon, discussed, criticised and praised so often and with such authority, that being invited to talk about it causes dismay long before one can feel flattered.

Ben Bernanke, ex-chair of the Federal Reserve and recently honoured with the Nobel Prize for Economics, though diverging from Friedman in significant aspects of his thinking, has not only been profoundly influenced by him but has often professed his admiration for him and acknowledged his intellectual debt to him.[2]

In order to compose this speech to the best of my ability, I thought I would begin by briefly remarking on how opinions have changed on the topics covered by Friedman and Schwartz (F&S) in their classic book, from when it first appeared to the present day, with some specific references to Italy. These things are well-known, but it might be useful to go over them again together. I then thought of presenting, in the spirit of F&S, some simple evidence to start with, should someone with more time and skill than me want to write a reasoned 'Monetary history of the euro'. As we shall see, the preliminary evidence leads to questions rather than providing answers. I shall conclude with some observations, which I shall say straight off are neither a comment on the evolution of the ECB's monetary policy – regarding which I defer to the official statements of its representatives and of the Governing Council, starting with Governor Visco – nor do they express the Bank of Italy's official position: they are simply a set of personal thoughts on possible future analytical studies.

The history of economic thought is a constant back and forth. When F&S published their *Monetary History* in 1963, their position was quite an isolated one (although of

---

1 Without associating them with the opinions expressed here, I would like to thank Emilia Bonaccorsi di Patti, Giuseppe Ferrero, Stefano Pietrosanti and Alessandro Secchi for helping me to write this speech, as well as Paolo Angelini, Sergio Nicoletti Altimari and Ignazio Visco for their reading and comments.

2 See *Friedman's monetary framework: some lessons,* Federal Reserve Bank of Dallas.

course it was in no way ignored). The intellectual climate of the post-war period had seen, especially in English-speaking countries, the almost uncontested domination of Keynes-inspired economic thinking, rising out of the rubble of the Great Depression, and which seemed to be the main route for rebuilding the global economy out of the even greater destruction of the war. Two beliefs were central to this: (1) that, by itself, the economic system has no natural tendency to make full use of resources; and (2) that public intervention is therefore necessary, and can in fact be effectively fine-tuned to achieve a socially optimal result. The conceptual revolution of Keynes' *General Theory* (1936) had been swiftly followed by its formalisation by J. Hicks in 1937,[3] paving the way for the new approach to become firmly established in the academic world and producing a huge outpouring of literature, which continued after the war. Especially after A.W. Phillips' 1958 article, in which the famous curve that correlated (wage) inflation and unemployment appeared,[4] a belief was consolidated in the existence of a permanent trade-off that could be exploited for economic policy purposes.

Theoretical developments had also revolutionised the practical approach to the State's intervention in the economy, and in doing so prompted the deployment of academic economists as consultants to governments in order to draw up pro-active policies, far more so than in the past. Belief had spread far and wide, also and perhaps above all outside the academic world, that the 'experts' had all the necessary tools at their disposal to reduce unemployment, including in the long term, by means of appropriate macroeconomic policies. As regards money, the thinking was at the embryonic stage; the most important thing was for it to be 'cheap'.[5]

In Italy, this alignment took place somewhat later. Immediately after the Second World War, the classic orthodoxy embodied first and foremost by Einaudi,[6] and then by people like Bresciani Turroni, Corbino and Del Vecchio was still dominant; the institutional

---

3 J. R. Hicks, 'Mr. Keynes and the "Classics"; A Suggested Interpretation', *Econometrica* Vol. 5, No. 2 (April 1937), 147-159.

4 More precisely, if we may recall it here, *several* curves, referring to different periods and with quite a few hints that the relationship was anything but stable. The article ended with the following words: 'These conclusions are of course tentative. There is need for much more detailed research into the relations between unemployment, wage rates, prices and productivity'. More than sixty years on, it cannot be said that the author's wish has not come true; there must be thousands of empirical papers on the Phillips curve. Those who pursued this thread were not discouraged by the curve often turning out to be unstable and by its basic non-existence in the long term (see A. W. Phillips, 'The Relation Between Unemployment and the Rate of Change of Money Wage Rates in the United Kingdom', 1861-1957, *Economica*, Volume 25, Issue 100, November 1958, pp. 283-299). Of course Phillips was neither the first nor the last person to look at the relationship between the labour market and wage growth, always a central issue when building a complete dynamic model of the economy. However, the extraordinary fortune of his 'reduced form', which he himself recognised as needing a great deal of additional theoretical and empirical detail, remains noteworthy.

5 'The sole role assigned to monetary policy was to keep interest rates low', say F&S (exaggerating slightly) (*Monetary history*, p. 841).

6 Einaudi is well-known for clearly wanting to distance himself from the pre-*General theory* Keynes in his article 'Il mio piano non è quello di Keynes', published in *Riforma Sociale* (March/April 1933, 129-142). In his essay, Einaudi criticised Keynes' book *The Means to Prosperity*; he highlighted the supply-side causes of the crisis – destruction and poor allocation of resources due to the aftermath of the shock of the first world war – and reiterated that, given these constraints, any monetary expansion would mainly have led to inflation.

framework that shaped the 'economic miracle' was built on this intellectual platform, firstly via the stabilisation of the lira, and then through membership of the common European market. Later on, however, the landscape changed completely, with a new generation of economists.[7] The global tendency towards intervention for macroeconomic regulation was accompanied, together with the changes in the political situation, by a uniquely Italian approach to development planning (or 'programming').[8]

Your speaker today studied economics at an Italian university in the 1970s, and can bear witness to how the economics taught at that time was of a wholly Keynesian stamp. It was a mature and systematic Keynesianism, which had of course lost something of the brilliant, clever, daring, eclectic and iconoclastic imprint of the founder of this school and was conscious of its orthodox academic status. I think that the atmosphere of that time is neatly summarised by this extract from a book by Eric Roll,[9] not only in honour of this occasion but also because it is a textbook that I studied at university back then:

For those who have learnt their economics since the end of World War II and to whom the currently used terms and the concepts to which they relate are commonplace, it is almost impossible to imagine the sense of emancipation bordering on revelation with which the generations that preceded them greeted the emergence of what became known as the 'New Economics'. … "[I]t is now easier to see the 'great divide' that separates the economics of the period up to the thirties from what came after." (p. 481) [F]or at least over thirty years after the appearance of Keynes's General Theory, the status of economics, largely of the kind associated with his name and general approach, increased steadily until it reached a position of authority, both as a branch of social science and as a perceived tool for the better ordering of human affairs, unparalleled in its history and unequalled by any of the other of the non-physical sciences. (p. 560).

In practice, a construction that seemed to rest on such solid foundations was already wobbling (perhaps in this case, too, these movements hit Italy's academic world with a certain delay). I quote Roll once again:

Yet in the latter phase of this period, the authority of the views of economists begins to be doubted, to the point that uncertainty starts to creep into the pronouncements of economists themselves, both about practical matters and about the limits of understanding of their whole intellectual apparatus (p. 560).

Some doubts had in fact emerged as early as the 1960s, when fine-tuning the economy had turned out to be more difficult in practice than expected, creating a tendency on the one hand for frequent 'stop & gos' and on the other hand for a 'creeping' increase

---

7 The most illustrious representative of this group was perhaps Federico Caffè. His *Lezioni di politica economica* (Lectures on economic policy), which shaped generations of Italian economists, began to appear in 1966. Those who had him as a teacher recall his extraordinary intellectual openness, including towards positions far removed from his own. Ignazio Visco, who has allowed me to quote him on this, tells me that 'he (Caffè) got on very well with Friedman and wrote him a letter to get me into Chicago University; my application was accepted, but I decided to go to the 'Keynesians' (at that time) at Penn...' Yet Caffè's position was clear.

8 However, a line of thinking that was attentive to monetary aggregates and to price stability did stay alive. Guido Carli wrote in his autobiography that 'the Bank of Italy had always paid special attention to credit and to the multiplier: it was a legacy from Einaudi's time as governor, from the works of Mortara and from the young Baffi' (*50 anni di vita italiana*, Laterza, Bari, 2a ed., 1996, p. 260).

9 Eric Roll, *Storia del pensiero economico*, Boringhieri, Turin, 1977.

in inflation.[10] In the United States, using the budget for countercyclical purposes[11] and attempting to exploit the supposed trade-off between inflation and unemployment eventually also created tension with the role of the dollar as the gold-pegged linchpin of the international monetary system.

The inconvertibility of the dollar declared in 1971 (which put an end to the Bretton Woods system and removed the admittedly imperfect anchorage it gave), the oil shock of 1973 and the advent of stagflation in the wake of these two events could not be dealt with using the orthodox instruments of those times. They seriously undermined the belief that the Phillips curve could be used for economic policy purposes; and, in terms of what interests us here, in the space of a few years, they stimulated new thinking on the management of money as an anchor for stability.

It would not be even remotely possible here to go over the intellectual and political debate set off by those events. It also took on ideological connotations that were perhaps ill justified, the remnants of which have not yet entirely disappeared, especially in non-specialised publications.

The fact remains that, confronted with an apparently uncontrollable inflation, and with the theoretical ideal pegging to gold lost, the economy had to go back and look at money from the fundamental point of view of ensuring price stability. A Friedman-style approach, though revised and adjusted in light of the evolution of conceptual tools and of practical experience, came back into fashion.

It is worth recalling that, although nowadays the fundamental link between monetary policy and price stability sounds obvious, and in certain cases (as in that of the ECB) it is enshrined in the Statute of the central bank, at that time this concept was 'far from being the conventional wisdom':[12] it was decidedly marginal compared with the mainstream.

On a practical level, the reversal of this trend was came about in the United States following the appointment of Paul Volcker as Chair of the Federal Reserve in 1979. Under his leadership, both the conduct and the communication of monetary policy changed profoundly.[13] With inflation by then in double figures, Volcker's Fed applied a monetary restriction that caused a sudden rise in the level and the volatility of interest rates.

---

10 If, on the one hand, the Federal Reserve recognised the worth of low inflation and even acted aggressively on rates in the event of excessive price increases, this tendency was swiftly reversed when the public's attention was instead focused on unemployment growth (M. Goodfriend, 'How the World Achieved Consensus on Monetary Policy', *Journal of Economic Perspectives*, Vol. 21, No. 4, 2007; C. D. Romer and D.H. Romer, 'Does Monetary Policy Matter? A New Test in the Spirit of Friedman and Schwartz', *NBER Macroeconomic Annual*, Vol. 4, 1989). F&S had already warned in their *Monetary History* that: 'If [this] interpretation has any validity, it leads to the somewhat paradoxical conclusion that confidence in the efficacy of monetary policy in the 1950s was inversely related to monetary stability. As that confidence has grown, it has produced a growing instability in the stock of money. Hopefully, the process is not explosive but self-limiting'. (p. 838) At that time, however, this was clearly a minority opinion.

11 And, it has to be said, for the needs of the war in Vietnam.

12 Bernanke, *cit.*

13 M. Goodfriend, *cit*.

It stood firm against lively intellectual discussions, major social protests and a political attempt to block it.[14] At the cost of a significant but temporary recession, inflation fell from almost 14 to 3 per cent in the space of three years.[15]

This action was and still is a subject for debate,[16] yet it set a fundamental precedent, above all because of the firm way in which it was conducted. As a matter of fact, the Fed was not the first central bank to make such a move. As early as 1974, the Bundesbank had adopted a resolute approach to the fight against inflation, implementing a monetary policy based on controlling the quantity of money and communicating the target in order to steer expectations.[17]

The evolution of monetary policy was mirrored by an evolution in academic thinking, for which the two fundamental references were the articles by Kydland and Prescott and by Barro and Gordon.[18] The problem was defining optimal monetary policy principles in a pure fiat regime. Under certain circumstances, the action of a central bank may be vulnerable to dynamic inconsistency, thus distorting inflation upwards. The literature provides a variety of solutions ranging from strict rules for money supply growth to the introduction of 'constitutional' constraints to specify the purposes of central bank action and protect its independence. These issues are well-known and need not be discussed here. What matters for our purposes is that money was essentially seen as the determining factor for price development, and not as being auxiliary to macroeconomic stabilisation policy. In this strand of literature, the rate of price increases, for a given level of real growth, is determined in the long term by the money growth rate (a concept which, incidentally,

---

14 Ethan Harris, in the reconstruction of the recent history included in his work on Bernanke's Federal Reserve (E. Harris, *Ben Bernanke's Fed: The Federal Reserve after Greenspan*, Harvard University Press, Boston, MA, 2008, p. 46) mentions a draft law designed to force through an easing of monetary policy, a congressional resolution with the same aim, various calls by members of Congress for Volcker to resign, and numerous attempts by the public and by representatives of various industries to intimidate the central bank, including the farmers' siege of the Fed's main building in Washington DC in 1979. The Federal Reserve under Volcker remained steady even in this tense atmosphere; this capacity to stand its ground set a precedent that would later be followed by Greenspan during the presidency of Bush senior.

15 The peak in the annual growth rate of the consumer price index was 13.6 per cent in June 1980; the index went down to 2.9 per cent in June 1983. It rose slightly later on and then stood at between just under 4 and just over 5 per cent in the following ten years (source: Bureau of Labor Statistics, index of consumer prices excluding food and energy products, average for urban areas, which can be consulted at).

16 As examples of contrasting points of view, see B. Friedman, 'What Remains from the Volcker Experiment', *Federal Reserve Bank of St. Louis Review*, Vol. 87 March/April Part 2, 2005; M. Goodfriend and M. King, 'The Incredible Volcker Disinflation', *Journal of Monetary Economics*, Vol. 52, No.5, 2005.

17 Specifically, in 1974, the Bundesbank began to implement a policy of setting a target in terms of monetary aggregates, supported by a transparent communication of this target to guide the expectations of people and firms, with the aim of tempering the uncertainty caused by the end of Bretton Woods (O. Issing, 'Why Did the Great Inflation Not Happen in Germany?' *Federal Reserve Bank of St. Louis Review*, March/April, Part 2, 2005). Germany's success in combating inflation was not entirely due to pursuing monetary objectives, which moreover were not always achieved; to name but one, the lack of a wage-indexation system was an important factor, as was the revaluation of the exchange rate, which is after all linked to monetary policy.

18 F. E. Kydland and E. C. Prescott, 'Rules rather than Discretion: The Inconsistency of Optimal Plans', *Journal of Political Economy*, 85, 3, 1977; R. J. Barro and D. B. Gordon, 'Rules Discretion and Reputation in a Model on Monetary Policy', *Journal of Monetary Economics*, 12, 1, 1983.

would be quite intuitive if money as a means of payment had immutable characteristics); monetary policy is considered scarcely effective, or even counterproductive as a cyclical stabiliser.

Under the pressure of the dramatic events of the early 1970s, economic theory therefore reacted by questioning the paradigms of that time. In 1976, among other things, Friedman was awarded the Nobel prize in economics.

The examples of the Bundesbank and the Federal Reserve and their successful fight against inflation inspired other central banks to claim their independence as the keystone for effective action against inflation. In Italy, as late as 1974, Governor Guido Carli had to recognise, in a famous remark, that the central bank's refusal to fund the public sector's deficit through the creation of money would, given the institutional framework and historical circumstances of the time, be tantamount to a 'seditious act':[19] in other words, money was under a fully-fledged fiscal dominance regime[20] (although the Bank did try to regain a certain degree of autonomy by placing purchased securities on the market and, indirectly, by capping bank loans). In the *Concluding Remarks* for the year 1975, Governor Paolo Baffi had already cited the Bundesbank – whose anti-inflation mandate was defined by law – as an ideal.[21] In 1981, under Governor Ciampi, in a different political and social scenario, there was a change of regime: what was known as the 'divorce' between the Bank of Italy and the Treasury removed the central bank's obligation to act as residual purchaser of government securities. This finally gave full and actual independence to the Bank, which was now able to adopt a rigorous anti-inflation monetary policy.[22]

---

19 See *Concluding Remarks for the year 1973*, 31 May 1974, p.32. Reading the book by F&S offers a curious parallel with William Harding's reply, as Chairman of the Federal Reserve in 1919, to those who reproached the institution for failing to raise the discount rate when it was necessary (the issue had, in fact, been the subject of lively discussion within the Board): "The Board felt that it was its duty to cooperate with the Treasury authorities. Failure to cooperate would have been tantamount to an undertaking by the Board to dictate the policies of the Treasury…" (p. 302).

20 The issue is, indeed, the object of debate (see E. Gaiotti and A. Secchi, 'Monetary policy and fiscal dominance in Italy from the early 1970s to the adoption of the euro: a review', Banca d'Italia, Questioni di Economia e Finanza (Occasional Papers), 141, 2012). Many (including Toniolo and Carli himself) emphasised the context: the exceptional political and social tensions prevailing in Italy at that time would not have permitted any other choice of monetary policy. All of this is undoubtedly true and, in this regard, we can refer to a few brief comments on the evolution of the strategy implemented by the Bank of Italy between the 1970s and the 1980s to tackle the political and social changes underway, which are contained in a recent speech I gave ('Luigi Einaudi's Considerazioni finali', Banca d'Italia, 2021). Nevertheless, that the choice was deliberate, perhaps even made independently, and justified by the circumstances prevailing at the time, does not, in my opinion, alter its substance; that is (in the definition of fiscal dominance used by Gaiotti and Secchi, borrowed from Sargent) 'a coordination scheme in which the fiscal authority acts first and independently sets its current and future deficits and surpluses, thus determining the overall amount of revenues that must be raised either through bond sales or seigniorage; the monetary authority operates under the constraints imposed by private demand for government bonds and the need to ensure the solvency of the fiscal authority'.

21 See *Concluding Remarks for the year 1975*, 31 May 1976, p.43.

22 Governor Ciampi said that 'The reinstatement of the government budget as an economic policy instrument may be considered to form the apex of a triangle that represents the elements necessary for the restoration of a sound currency; the other two corners are the consistency of behaviour affecting wage determination and the independence of money creation from the centres of expenditure.' (*Concluding Remarks for the year 1981*, 31 May 1982, p.24).

The main legacies from that period were therefore a renewed focus on price stability as the lodestar of monetary policy, and the importance of central banks' independence. These fundamental concepts are still alive in essence. However, with regard to how they were applied, in the years following the great disinflation, pursuing quantitative money growth targets gradually became less relevant empirically, in theory and in central bank practice. As intuitive as it may seem in the abstract, starting in the late 1980s, the relationship between prices and the quantity of money actually became rather elusive.

The reasons why this relationship petered out are disputed. Presumably, they include innovations in finance and in payment systems, which flourished at a time of deregulation and influenced the relationship between nominal income and the desired cash balances ('velocity of money'), and the substitutability of financial instruments (definition of 'money'). At the same time, an increasingly globalised economy kept production costs down by boosting the quantity of low-cost labour incorporated in a product, thereby easing inflationary pressures, the money supply being equal.

The monetary policy stance thus changed tack again, although it did not entirely reverse its course. I shall not dwell on the theoretical developments: in an attempt to find common ground between the Keynesian and the monetarist approaches, while still highlighting the importance of price stability as an objective of monetary policy and the need to solve the issue of inter-temporal consistency through institutional mechanisms to ensure the independence and credibility of the central bank,[23] there is now less emphasis on monetary aggregates[24] and monetary policy has regained its cyclical stabilisation function through interest rate manipulation (the Taylor Rule).[25]

In 1989, the central bank of New Zealand was the first to adopt an inflation targeting strategy, and many others followed, in one form or another.[26] In the United States too, the instability of money demand resulted in the Fed taking short-term interbank rates as the operational target of monetary policy instead of the growth rate of the M1, M2 or M3 monetary aggregates.

The focus on monetary aggregates survived for a while in Europe. At its inception, the ECB was influenced by the Bundesbank's monetarist tradition. While constant money growth was no longer pursued, and the objective of monetary policy, in accordance with the Treaty and the Statute, was defined in terms of the inflation rate (initially 'below 2 per cent'), in line with the other major central banks, monetary aggregates retained a significant role as a signal of inflationary pressures (the 'first pillar' of the analysis). In fact,

---

23 M. Goodfriend, *cit.*

24 M. Woodford, 'How Important is Money in the Conduct of Monetary Policy?', *NBER Working paper*, 13325, 2007.

25 See, for example, J.B. Taylor, 'Discretion Versus Policy Rules in Practice', in *Carnegie-Rochester Conference Series on Public Policies*, 39, North-Holland, 1993. See also Taylor's preface to *A Monetary History*, discussed here today.

26 For a review, see L. Leidermann, L.E.O. Svensson (Eds.), *Inflation targets*, London, CEPR, 1995.

in Europe, they seemed to keep their information content on future inflation for longer.[27] As for M3, the ECB explicitly defined a benchmark growth rate (4.5 per cent).

Starting in 2001, however, immediately after the launch of the monetary union, M3 began to grow systematically more than the benchmark rate, while prices continued to record steady and limited growth. It was now money demand that appeared to have become unstable. In 2003, the ECB redefined its price stability target as inflation 'below, but close to, 2 per cent' and reduced the role of the 'first pillar' to cross-checking the results of economic analysis.[28]

Looking back though, what has actually happened to monetary aggregates in the long run, nearly a quarter of century since the establishment of the monetary union? Adopting an F&S-style approach, what can we say about the relationship between quantities of money and inflation? What can the most recent events teach us? I shall only give a few examples; for 'A Monetary History of Europe since 1999' we would need another Friedman and another Schwartz, and I am certainly not up to the task.[29] The data I am going to present are therefore only food for thought. First, however, let us briefly review the operational procedures that have been used over time to enforce the ECB's monetary policy.

In a modern monetary system, the central bank provides two types of money: cash (currency in circulation) and reserves. The amount of cash supplied to households and firms is entirely dependent upon their demand: central banks meet the demand for cash in a perfectly elastic way. Those who require banknotes go to a bank or to an ATM and convert bank money into cash; the bank obtains cash freely from the central bank in exchange for reserves.

The other type of money issued by central banks is in the form of reserves, which are exchanged by intermediaries whenever bank deposits are transferred, or returned to the monetary authority when depositors request cash. Their importance lies in their link with bank deposits.

In the euro area, refinancing operations were the main tool for providing the banking system with reserves up until 2015. Until October 2008, the Eurosystem provided reserves via variable-rate, fixed-quantity liquidity tenders. The quantity was set in an essentially passive manner, by estimating banks' liquidity needs based on past deposit balances.

---

27 K. Masuch, S. Nicoletti Altimari, H. Pill and M. Rostagno, 'The Role of Money in Monetary Policy Making' in *Background studies for the ECB's evaluation of its monetary policy strategy*, 19, 2003.

28 The focus on quantities shifted from the relationship between money and the price of goods and services to that between credit and asset prices, with a view to preventing financial crises. This is a broad issue which, among other things, relates to the thinking on the macroprudential instruments designed to mitigate the side effects of monetary expansion and on the first experiments in utilising them. It would not be possible to deal with it here.

29 The literature, however, abounds with quality work, though recently the focus on monetary aggregates has waned. For an accurate retrospective account, see for example P. Hartmann and F. Smets, 'The first twenty years of the European Central Bank: monetary policy', European Central Bank, Working Paper Series, 2219, 2018.

In 2008, the Eurosystem switched to fixed-rate tender procedures with full allotment. This means that, since 2008, banks have been able to request any amount of reserves, as long as they have sufficient collateral: the supply of reserves provided through these operations is perfectly elastic.

In line with the flexible inflation targeting strategy – common to all the major countries, broadly speaking – the quantity of money was not therefore directly controlled by central banks but was determined endogenously based on money market conditions (including, of course, policy rates).

In January 2015, when interest rates were close to their lower bound, the Eurosystem (like other central banks) switched to an explicit *quantitative* easing strategy. Once again, the quantities involved are not the monetary aggregates, but rather refer to financial asset purchase programmes. They mainly act by lowering medium- and long-term interest rates by purchasing public and private bonds at various maturities. However, when a central bank purchases assets, it also creates reserves. When securities sold to central banks were previously owned by households or firms, the increase in reserves is also coupled with an increase in bank deposits. Growth in the monetary aggregate is no longer an indirect consequence of policy rates driven by money demand, but a direct consequence of central bank purchases.

Monetary accommodation has generated a substantial increase in the monetary base, especially after the adoption of the quantitative easing strategy [Figure 1]. Central bank reserves increased by around 400 per cent during the sovereign debt crisis and by 1700 per cent between January 2015 and May 2022. Deposits by households and firms grew much less, but still significantly: between 2015 and 2022, the narrow M1 aggregate, which also includes currency in circulation, increased by 92 per cent (10 per cent per year on average). The broader M3 aggregate grew by 52 per cent.[30]

Inflation, as measured by the harmonised index of consumer prices, having remained well below 2 per cent in 2020, rose to 3 per cent in 2021 and then accelerated again in the first half of 2022 to 7.5 per cent [Figure 2]. Today, it is close to 10 per cent. From a qualitative point of view, Figure 2 suggests that there is a correlation between the Divisia M3[31] monetary aggregate and inflation, with the former preceding the latter; however, this correlation is uneven and has broad variations, and it is not obvious how these variations should be treated analytically in this context. To provide some exploratory evidence, the colleagues who helped me prepare these notes have plotted a pair of correlograms in Figure 3 showing the co-movement of inflation and growth in the Divisia M3 monetary aggregate for two different sub-periods. They confirm both the existence of a correlation

---

30 A substantial part of the asset purchases under the APP and the PEPP did not directly involve the portfolios of households and firms, and a large part of the increase in reserves is linked to refinancing operations, specifically T-LTROs.

31 Divisia monetary aggregates combine monetary sub-components based on their transaction services. Specifically, sub-components are weighted by their yields, which are 'inverse' indicators of the transaction service. The difference between M1 and Divisia M1 is normally minimal, as the M1 sub-components' yields are relatively low and stable. Conversely, there are more obvious differences between M3 and Divisia M3, especially until 2015 when the yields on the longer-lasting monetary sub-components were significantly higher.

in the most recent period and its instability over time. There is no correlation between Divisia M3 growth and lagged inflation in the period 2001-12, while the correlation is significant in the subsequent period and peaks at one year approximately.[32]

When reading these data, we cannot disregard the concrete conditions under which inflation picked up, especially the post-pandemic bottlenecks and above all the violent shock of the war and the soaring energy prices. These data are therefore not to be taken as evidence of causal relationships. Movements in variables, especially in the most recent period, have been unusually sudden and affected by exceptional factors. The lags hypothesised by monetary policy are, as we know, long and variable, and there are countless omitted variables. Of this evidence, we can only say with certainty that, rightly or wrongly, it has been used very little in more recent times. I am only showing it today to encourage better-founded and more in-depth analyses.

The idea that inflation is 'always and everywhere' a monetary phenomenon did not originate with Friedman,[33] nor is it limited to a world where the legal tender is paper-based. The relationship between the quantity of money and prices has been addressed by writers on monetary matters since the Middle Ages.

In a trivial sense, this relationship is obviously true: since the absolute level of prices is defined in relation to a numéraire, without money, we cannot even talk about inflation. In a pure barter economy, there are only relative prices. Slightly less trivially, however complex and misunderstood the mechanisms that generate seasonal, cyclical and secular variations in V may be, and however controversial the definitions of income (or transactions) and money, the fact remains that PY=MV is, conceptually, an identity.

The problem arises when we want to derive a theory and a prescription for economic policy from this identity. We then need to specify the magnitudes in an operational way and establish a direction of causality. To be as succinct as possible, the conclusion of the book by F&S is threefold: (1) the velocity of money is 'extremely' stable (or rather inertial, as we would describe it, in the sense that it moves very slowly and regularly at low frequencies: pp. 923ss.); (2) despite the profound changes in the monetary regime that occurred over the century examined by the authors, and despite the different impact of many events (both economic and institutional), of peace and war on the main components of money (currency in circulation, deposits, reserves), the previous statement remains true overall (pp. 930ss.); and (3) variations in the quantity of money are often

---

32 Following an approach common to many studies on modern business cycle theory, cross-correlations have been computed on their cyclical component rather than on raw time series. This choice stems from the need to obtain results that are not affected by components relating to different frequencies, such as seasonality or long-term growth. We use the methodology proposed by M. Baxter and R.G. King in 'Measuring Business Cycles: Approximate Band-Pass Filters for Economic Time Series', *Review of Economic and Statistics*, Vol. 81, No. 4 1999, which, in summary, exploits the properties of moving averages and some findings of frequency theory to extract the cyclical components relating to the sought-after frequencies from the raw series. In any case, using percentage changes in time series instead of filtered data does not substantially affect the results.

33 Who did not actually formulate it in his book with A. Schwartz but in a different publication of the same year: M. Friedman, *Inflation: Causes and Consequences*, Asian Publishing House, 1963.

'independent' (i.e. exogenous) and the predominant direction of causality is from money to nominal income (pp. 944ss.).

Nowadays, these statements are difficult to take without a pinch of salt. If nothing else, innovation and the diversification of payment methods have made the velocity not only presumably more unstable, but also harder to define and measure.

The exogenous nature of money, implied in the full version of the sentence referenced above, is a complex and perhaps insufficiently thought out issue nowadays: 'Inflation is always and everywhere a monetary phenomenon in the sense that it is and can be *produced* only by a more rapid increase in the quantity of money than in output' (my emphasis). As we have seen, depending on the historical circumstances and the ultimate objectives of monetary policy, central banks can choose intermediate targets in terms of quantity or rate (or something else), and the technical characteristics of monetary policy operations vary. In the first two decades of this century, interest rate targets have largely been predominant, at least until they hit the effective lower bound of nominal rates. However, at least in principle and notwithstanding the infinite complications of reality, the symmetrical and dual nature of the choice appears obvious.[34] Even if it is the interest rate curve that we want to influence, and, operationally speaking, deciding the quantity is left to the market, quantities are ultimately decided indirectly by central banks through the demand expressed by the market at the policy rate. The irreducible freedom of those who have the power to create it is inherent to the concept of fiat money.

The question, therefore, is not so much whether the central bank *can* influence quantities autonomously, but rather whether quantities *make sense* as an operational objective or, at least, as a signal to be considered. As we have seen, how this problem has been addressed has changed repeatedly – and quite radically – over time. Between the late 1970s and the early 1980s, the conversion to quantitative rules of some of the world's leading central banks was the instrument through which they overcame post-oil-shock inflation. While the quantitative zeal of that time may appear simplistic, perhaps even dogmatic today, we need to consider that the monetarist narrative, together with the contemporaneous theoretical rationalisation of having a 'conservative' and independent central banker, was likely a key factor in strengthening central banks' resolve to pursue their stabilisation policies, despite the significant costs and highly vocal opposition.

Simplistic and dogmatic attitudes waned considerably in the 1990s, as more flexible inflation targeting strategies gradually took hold. At the turn of the century, although the ECB's initial strategy continued to acknowledge the primacy of the monetary 'pillar' in a formal sense, at least for signalling purposes, the information content of the aggregates appeared to decrease over time and the focus on them diminished. After all, for twenty years, inflation had been so moderate – also owing to global factors independent of monetary policy in Europe and elsewhere – that it was difficult to identify robust econometric relationships between prices and monetary aggregates. At the end

---

34 The issue of the equivalence between rules based on the interest rate and rules based on the quantity of money is addressed at length by John Taylor in his foreword to this edition of *A Monetary History of the United States* (pp. XIIss.).

of that period, no one was looking at the statistics on monetary aggregates any more. If anything, they were looking at those on credit and were mostly concerned with avoiding unwanted credit tightening measures.

However, perhaps looking afresh at *A Monetary History* might make one wonder whether a total disregard for the quantity of money is as one-sided an attitude as was the obsessive focus on it of the previous generation. Unlike F&S, we believe that V is far from being 'extremely' stable; that it depends – besides on the economic cycle, as F&S also recognised[35] – on technology, custom, opportunity cost, and on many other factors we do not grasp very well. Yet precisely because we do not grasp them very well, and because we have observed sharp changes in one direction, we cannot rule out that, if the underlying conditions change, equally strong changes could occur in the opposite direction. While the global 'reserve army of labour' has long kept inflation down in the advanced countries, thereby preventing the inflationary potential inherent in the strong global accumulation of liquidity in recent years from materialising, an equally exogenous factor such as an energy price shock could trigger it.

The sizeable monetary expansion that followed the outbreak of the pandemic – let this be stated clearly to avoid any ambiguity – was essential at that time to avert a destructive financial deflagration. That said, no one ever denied it could have side effects. The main concern of yesteryear was potential financial and real-estate 'bubbles'. Today, considering that various kinds of exogenous events have led to sudden rises in consumer prices, the risk that the large money balances held by the private sector could contribute to accommodating inflation must be averted.

Perhaps, thinking back to the energy shock of fifty years ago, one can venture to say that inflation, if not always and everywhere a 'monetary phenomenon' in a causal sense, is generally a 'money-*enabled* phenomenon'. The touch paper for this was (in Europe) energy and commodity prices; that said, the fuel is there, and it must not catch fire. The change of course in the monetary policies effected by the central banks of the advanced countries must be seen, I believe, from this perspective too.

I would like to conclude with a methodological consideration. Paradoxically, a book that has fuelled the debate on monetary theory and policy like few others is neither a theoretical book nor a manual containing policy prescriptions. It is an economic history book. Even more than that: it is a book in which history is narrated in words and where the quantitative aspect is only present in the form of very simple – and almost boring, if you will – tables and charts. Reading it today, what is striking – in a text that contains the bold general conclusions I have just discussed – is the complete absence of econometrics (there is only one slightly cryptic reference, on pages 903-04, to an attempt at quantitative validation, which is in any case abandoned). This absence, however, is countered by the meticulous reconstruction of the concrete conditions against which

---

[35] See for example pp. 757 and following, 924-25. Despite their overall conclusion that we succinctly summarised earlier, F&S devote considerable effort to discussing the interpretation of changes in V that are not easily ascribable to cyclical reasons. See for example, with respect to the period after the Second World War pages 873 and following and 888 and following.

history was unfolding, backed by an extensive, even monumental array of sources. Wars and peace treaties, laws and political movements, monetary and real markets, bank profits and failures; institutional changes and power struggles; practical debates, among financiers, within the central bank, in Congress and in public opinion, reconstructed precisely and passionately; individual characters; and fascinating hypotheses on what might have happened if a given public figure had not died prematurely or if a given dispatch had been sent one day earlier.

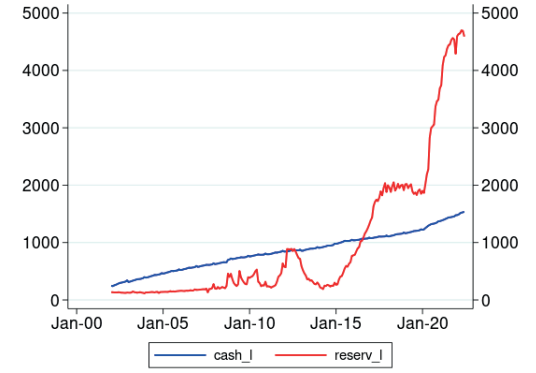
All this makes for compelling reading (at least in some parts: I shall not claim that the reader's attention never lets up for the almost one thousand pages of the book). In the end though, what is the epistemological status of the conclusions that may be drawn from a huge mass of data and observations that is reasoned, but not super-systematic and untramelled by rigorous quantitative scrutiny? I do not have a clear-cut answer. I will only say, and this is nothing new, that the book makes one ponder the comparative virtues of an approach of this kind compared with the one that is not only dominant by far today, but is also considered indispensable to reach conclusions – be they positive or normative – that may be called scientific. Formalised theory and rigorous econometric methods force us to formulate hypotheses in a precise and coherent way and make it possible to test them against Popper's falsification principle. However, the price to pay, in the realm of economic science, is a 'flattening' or hyper-simplification of reality as well as (on the part of the least aware among us) a certain disregard for the concrete history of facts. This may create an illusion as to the general validity of the results obtained and can even blind us with respect to the evidence presented.

On may conclude, rather obviously, that both approaches are useful and necessary, and both may be fruitful in great hands but perhaps barren in the hands of others. However, since econometrics has made huge strides in the meantime, and can now make use of more complex and flexible models than were previously available, I may perhaps add, as a valediction, that the quantitative evidence to which I have alluded during this presentation deserves a little more attention – both qualitative and econometric – than it has received in the recent past. In any case, what is needed is an open mind, a focus on concrete facts, and perhaps a touch of eclecticism, the latter being something with which, after all, the art of central banking has never been able to dispense completely.

Figure 1 - Cash and monetary base (cash + reserves)

(monthly data)

Levels (billions of euros and index number)



Annual growth rates (%)

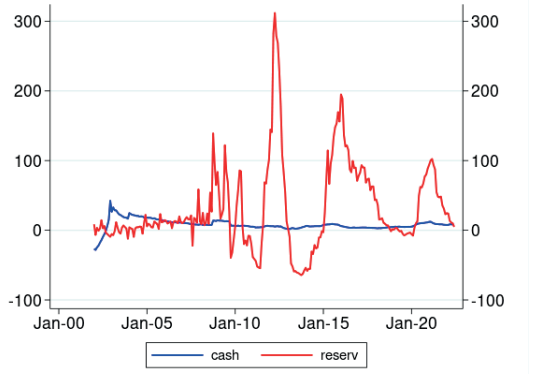
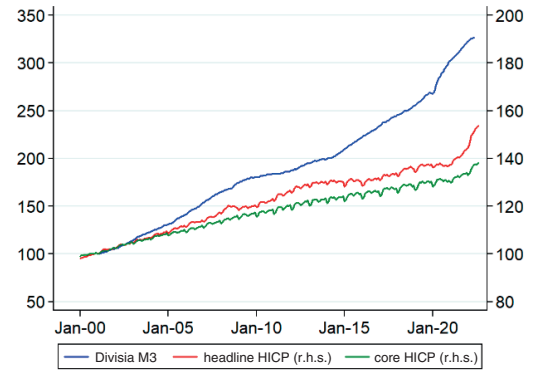


Figure 2 - Divisia M3 and consumer prices (HICP) in the euro area

(monthly data)

Levels (Jan-2001=100)



Annual growth rates (%)

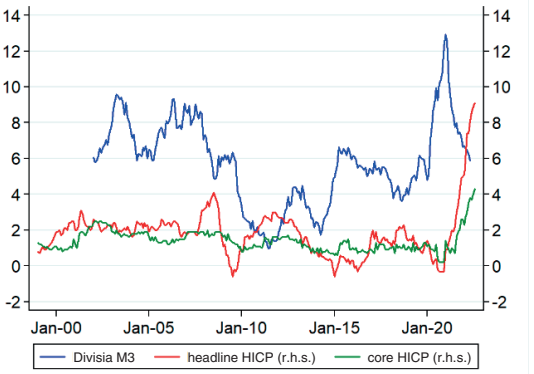
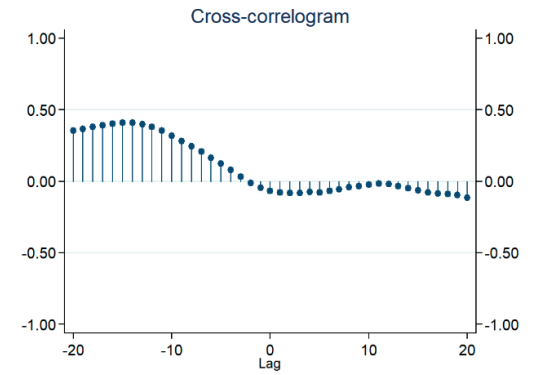


Figure 3 - Co-movements between Divisia M3 and consumer prices (HICP) in the euro area

Cross-correlation between the annual growth of Divisia M3 (t) and that of the headline HICP (t+h)

Jan 2001 – Dec 2012



Jan 2013 – June 2022