

Introduction to Michael D. Bordo and Lars Jonung, *Demand for Money. An Analysis of the Long-Run Behavior of the Velocity of Circulation*, Transaction Publishers, New Brunswick and London, 2003.

DEMAND FOR MONEY

An Analysis of the Long-Run Behavior of the Velocity of Circulation

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Introduction to the Transaction Edition¹

In 1987, we published *The Long-Run Behavior of Velocity: The International Evidence*.² There we presented evidence that the income velocity of money for five countries for which we had good data—the United States, Canada, the United Kingdom, Sweden, and Norway—displayed a U-shaped pattern from the 1870s to the 1970s. Similar patterns were found for a number of other countries. Velocity went through three stages: first it declined, then it fluctuated around a fairly flat section, and finally it rose. Next, we developed and tested an explanation for this long-run pattern, emphasizing the role of institutional variables. We hypothesized that the decline was due to a process of monetization, whereby the growth in the demand for moneyholdings outpaced that of real income, thus inducing a fall in velocity. The rise was attributed to financial sophistication, the development of close substitutes for money, and to improved economic security and stability. The turning point, that is, the low point of the velocity curve, marks the phase where these two institutional forces roughly balance each other.

As there were no available measures of the institutional changes that we considered, we constructed a set of proxy variables. These were then incorporated into the arguments of a standard money demand function.³ In our empirical work we found support for the institutional approach based on four types of evidence: an econometric study of the long-run velocity function for the five countries for which we had adequate data, a cross-section study of about eighty countries in the post-World War II period, a case study of the monetization process in Sweden prior to 1914, and an examination of the time series properties of velocity.

Following the publication of our book, we updated the empirical work through the 1980s in Bordo and Jonung (1990). We also used co-integration techniques in a joint paper with Pierre Siklos which confirmed the earlier findings up to 1992 in Bordo, Jonung and Siklos (1997).

In what follows we first track the evolution of velocity in the last quarter of the twentieth century in the way our original book examined the evidence up until the mid-1970s. Next, we discuss how the views of the economics profession on money demand have developed since the 1970s; in short this is a story of how money has disappeared from the research agenda. Finally, we consider under what circumstances money demand, and thus velocity, might return to the research agenda in the future similar to its revival in the 1960s and 1970s. Can we predict a new cycle of interest in velocity?

i. The empirical picture

In Charts 1-5 we add data for the period 1975-2000 for the five countries in our original sample. The reason we selected these five countries for the book was that they had, when we started our work in the early 1970s, the best available data for velocity as well as for the various explanatory variables used such as interest rates, measures of financial sophistication, and cyclical stability. Consistent with our earlier work, we add the velocity data for these five countries to 2000, thus providing our original sample 1880-1975, with an additional quarter of a century of observations. However, we do not extend our econometric work incorporating the recent data as this would require an empirical effort beyond the scope of this introduction. We retain our original money stock concept, that of an M2-measure.⁴ Thus all the charts are based on M2-velocity measures, although we are aware that the definition of money has likely changed over time in the countries included in our sample.

Which velocity pattern do we expect to see? Several exceptional factors may have influenced the trend behavior of velocity since the last quarter of the twentieth century. This was a period of rapid technological and legal changes within the financial systems of the world, to a considerable extent reflecting on the one hand, the breakdown of the Bretton Woods system in the early 1970s and on the other, the two oil price shocks. Money and capital markets were deregulated worldwide. Exchange controls within Europe were abolished in the late 1980s as part of the progress towards EMU and the introduction of the euro. Major banking and currency crises occurred in the world economy, primarily in the 1990s. Financial technologies underwent major innovations. Financial markets grew in depth and size. In short, we can talk about a global financial revolution.

Furthermore, in most countries the framing of monetary and fiscal policies underwent dramatic changes in the last quarter of the twentieth century. In many countries policy doctrines and policy techniques moved from a predominantly Keynesian approach focused on maintaining full

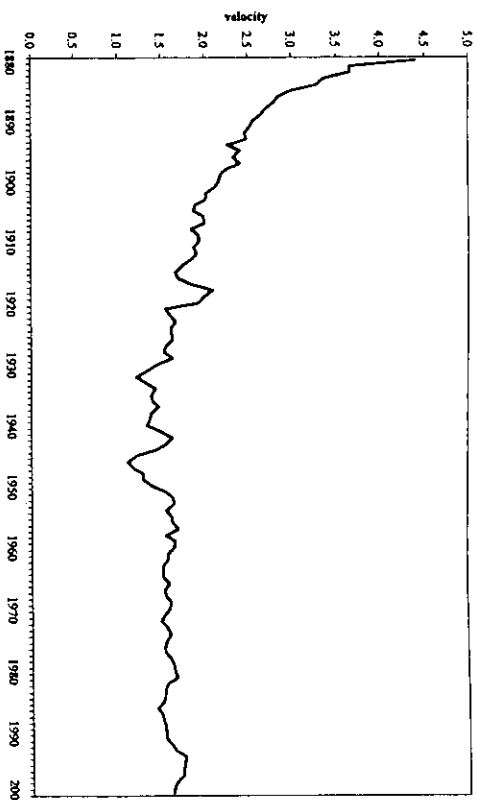


Chart 1. Income velocity of money (V2) in the United States, 1880-2000

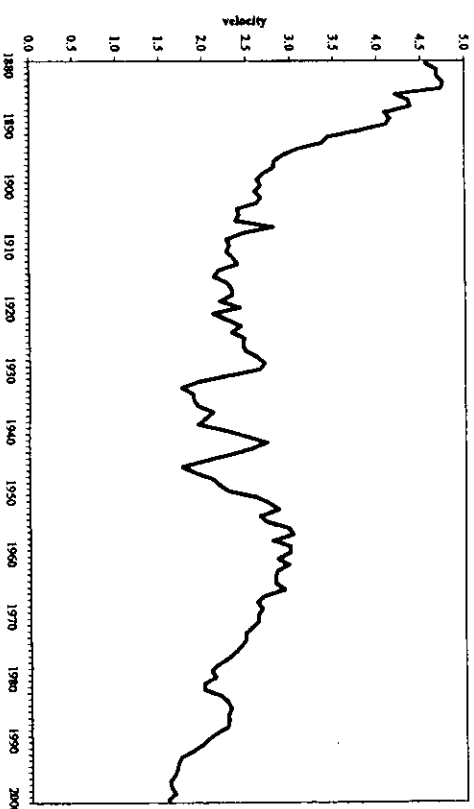


Chart 2. Income velocity of money (V2) in Canada, 1880-2000

employment and high growth, based on fine tuning, to a price-level-stability or inflation target oriented framework, with central banks more independent from the political system than before. Price stabilization was gradually given a higher priority than full employment.

It is unclear a priori how these far-reaching financial, technological and policy developments influenced velocity as well as the assets classified as money. Deregulation possibly promoted a rapid growth of financial assets as substitutes for commercial bank deposits and thus a rise in velocity. On the other hand, financial liberalization might have allowed commercial banks to develop more competitive forms of bank deposits, increasing the demand for deposits, and thus a fall in velocity. Also, these processes could have changed the proper empirical definition of money in different countries blurring the line of demarcation between money and other assets with a high degree of liquidity (that is "moneyness"). As a result, it might be difficult to construct measures of velocity comparable to those calculated for periods before 1975.

Keeping these institutional developments in mind, let us inspect the behavior of the income velocity of money displayed in Charts 1-5 for the period 1880-2000 adopting an M2-definition of money. The following conclusions emerge. For the United States there is a continuation of the fairly stable and flat trend in M2 velocity observed since the 1950s (Chart 1). This is so despite far-reaching financial innovations, episodes of inflation, disinflation, and financial stress.

For Canada the pattern is similar to that in the United States up until the late 1960s after which it shows a slight negative trend (Chart 2). We conjecture that this pattern reflects a major reclassification of financial institutions.⁵ What were previously termed trust companies were reclassified as chartered banks. We have not been able to adjust the historical data to completely compensate for this change in definition.

For the UK, like Canada, there is a problem in constructing a continuous M2 measure of velocity for 1975-2000, reflecting two changes in the definition of broad money from M2 to sterling M3 in the 1970s and to M4 in the 1980s. These changes were made to encompass the liabilities of a wider set of financial intermediaries. Unfortunately, The Bank of England has not adjusted the data preceding these changes to eliminate the discontinuity (Chart 3).⁶

For Sweden, a U-shaped velocity curve stands out when the observation period is extended (Chart 4). Here the curve was adjusted for changes in the commercial banking data by a level shift in 1955. Similarly for Norway, we have clear confirmation of our original hypothesis of a U-shaped velocity curve (Chart 5). In the post-World War II period there is a slight rise in the trend of velocity.

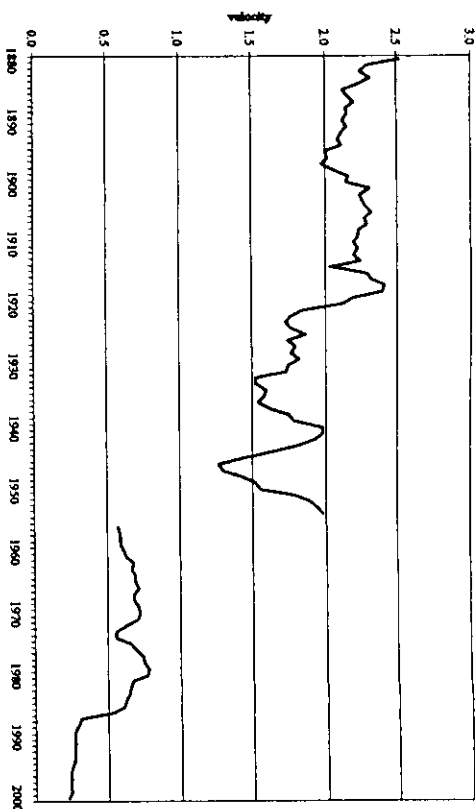


Chart 3. Income velocity of money (V_2) in the United Kingdom, 1880-2000

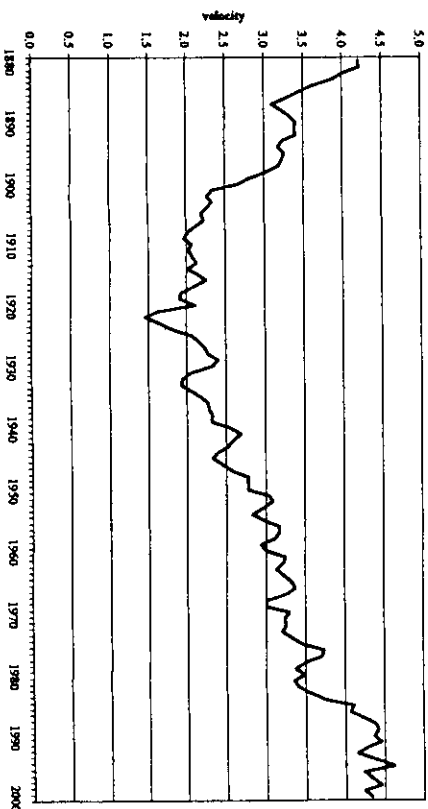


Chart 4. Income velocity of money (V_2) in Sweden, 1880-2000

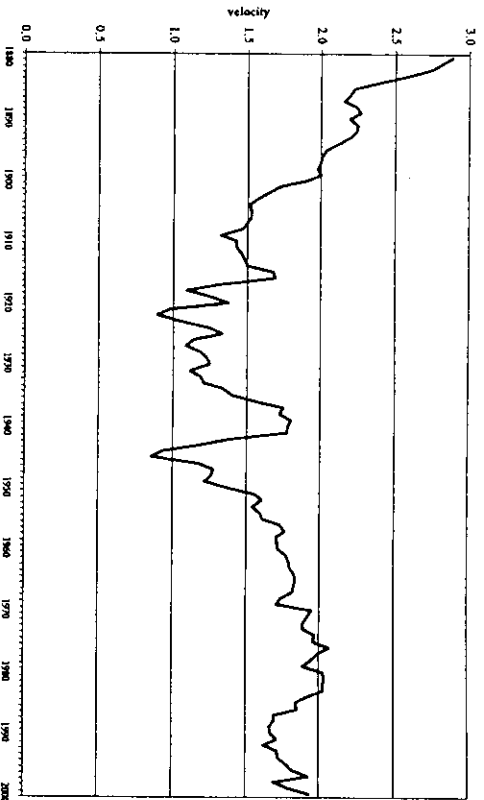


Chart 5. Income velocity of money (V_2) in Norway, 1880-2000

To sum up, this most casual inspection of the long run behavior of velocity covering close to a century and a quarter of data seems to be roughly consistent with what we found earlier. We suggest that the institutional approach of our earlier study is still a promising one. Thus we encourage further research on velocity incorporating the important institutional developments that have occurred in the past twenty-five years.

ii. The disappearance of the demand for money

In the 1960s and 1970s the demand for money (the income velocity of money) and the supply of money emerged as central topics in research and policy discussion. This was a result of the rise of monetarism following the perceived failure of prevailing Keynesian stabilization policies to curtail rising inflation. The monetarist message, as developed in the reformulation of the quantity theory of money by Milton Friedman and others in the 1950s and 1960s, was initially one stressing the existence of a stable *long-run* relationship between money and prices/nominal income through a stable long-run money demand (velocity) function. In the short run, however, monetary policy was associated with long and variable lags. Changes in the money stock influenced both output and prices in the short run with no clear division into real and nominal effects. This was a

major argument for the monetarist stress on a rule-bound monetary policy aimed at minimizing policy-induced disturbances.

In spite of this stress on the long run, the monetarist message was applied to the framing of short-run stabilization policies. This renaissance for money eventually influenced the actual conduct of central banks. The U.S. Federal Reserve, the Bank of England, the Bank of Canada as well as central banks in other countries started to use the short-run demand for money function as a key element in their monetary policy framework. Based on forecasts of the money demand function, central banks set short-term interest rates to achieve their desired stock of money target.

The strategy of monetary targeting ran into difficulties in the 1980s. A key reason was evidence of significant instability in the short-run money demand functions.⁷ These shifts caused large errors in the monetary control process. The factors that produced this result included the increase in the rate of inflation in the 1970s, followed by disinflation as well as important deregulatory steps in the financial system in the U.S. and other advanced nations. The experience of monetary targeting led to serious concern over the proper monetary aggregates to target in the short run and also over the proper specification of the money demand function. As a consequence, interest in the demand for money waned. Central banks abandoned monetary aggregate targeting and the use of the short-run demand function as an input in the monetary policy process.⁸

Since the second half of the 1980s many central banks, the Bank of Canada and Bank of New Zealand being pioneers, have used a different approach to conduct monetary policy. They now target the inflation rate directly, with an interest rate (the overnight commercial borrowing rate) as their instrument of control. In the US as well as in other countries the real economy and financial stability may also influence the interest rate target. In many countries central banking practice today is about setting the rate of interest on the basis of forecasts of the future behavior of inflation.⁹

Central banks have thus moved from using monetary aggregates to influence the rate of inflation and the real economy to the direct targeting of the inflation rate by setting the relevant short-term rate of interest. To put this point in terms of the standard macroeconomic textbook framework, the traditional IS-LM system where money demand and money supply jointly determine the rate of interest has been pushed aside, thus dispensing with money demand and money supply analysis. Instead, the central bank sets an interest rate, given a forecast of the future rate of inflation and output. Now the supply of money has become infinitely elastic, a residual with no explicit role in the transmission mechanism. This strategy does not require estimating either the short-run demand for money function, or the supply function for money. However, the macro-

economic model underlying current monetary policymaking implicitly includes the supply of and demand for base (reserve) money, which are determined endogenously. They need not to appear explicitly in the analysis, however.¹⁰

Today, inflation targeting without any explicit reference to the demand for and supply of money is the common approach to monetary policy making. However, the ECB, the central bank of the euro area, is an exception in the sense that one of the two pillars of the ECB's monetary policy strategy gives an explicit role to the money supply and thus to the demand for money. The use of the money supply by the ECB is at present a subject of controversy.¹¹ Many commentators are of the opinion that the ECB regards inflation targeting as the main pillar, but uses monetary aggregates as indicators of potential inflationary problems.

Reflecting these changes in the prevailing monetary policy strategy, the theory of the demand for money has changed little in the past quarter of a century.¹² After ruling out a stable short-run money demand function and after implicitly downplaying the role of money in the framework for monetary policy analysis, a logical next step appears to be to eliminate money fully from monetary analysis. Some monetary theorists have actually taken this step by establishing a monetary theory without money—a step that we suspect will prove to be less constructive in the long run.¹³

Empirical work on the demand for money has continued, however. Recent research gives a mixed picture. Several contributions are based on a distinction between the long run (low frequencies) and the short run relationship (high frequencies) between money and prices. Here money has made a return in the sense that recent results indicate that for low frequencies—say, observations lasting for three to five years—“inflation is always and everywhere a monetary phenomenon,” that is there is a strong link between the growth rate in the money supply and the rate of inflation. This strand of work basically reinforces earlier quantity theory interpretations concerning the role of money in periods of high inflation. For periods of low inflation, the correlation between money and prices tends to disappear. There is too much “noise” in the relationship for it to be statistically significant.¹⁴

Studies applying co-integration (error correction) techniques to examine the characteristics of the demand for money function have been published in the past decade. These studies, with their focus on long run equilibrium relationships confirm traditional views that money demand is a stable function in the long run of a scale variable (income or wealth) and an opportunity cost (a rate of interest).¹⁵ This approach also suggests that our institutional proxies are important determinants of long run velocity.¹⁵ Other studies have re-examined the characteristics of the short-run demand for money. Here the evidence is mixed.

iii. The return of the demand for money?

Let us conclude by presenting a forecast of the future of money demand analysis. It is our impression that the attention the economics profession and of policymakers pay to the supply and demand for money is a function of the rate of inflation. The higher the rate of inflation, the more attention is given to monetary aggregates and the demand for money. The high and variable inflation of the 1970s and 1980s led first to wide acceptance of the monetarist view that inflation is everywhere and always a monetary phenomenon. This influenced monetary policy making, leading to the adoption by central bankers first of monetary targeting, next to monetary contraction, followed by disinflation, and subsequently to the present low inflation environment. This process in turn led to instability in the demand for money which discredited monetary targeting and set the stage for the advent of inflation targeting.

We are presently, in the early years of the twenty-first century, living through a period of low and stable inflation. This non-inflationary environment, we believe, contributes to the weak link observed between money and the price level and thus to disinterest in money supply and money demand analysis. If inflation (or deflation) would appear in the future as a major policy issue among advanced countries, the analysis of the demand for money and thus of velocity may re-emerge as a lively research area.

Still—regardless of the level of inflation—we believe that it remains important to study how ongoing institutional changes such as financial innovations and regulatory developments influence our concept of money and the demand for and supply of money. We hope that this reprint of our work may contribute to such an interest.

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Notes

1. We are grateful to Karel Havik, Angela Redish, David Willoughby, and Geoffrey Wood for help with data for the velocity charts in this introduction. We have benefited significantly from the comments by Eoin Drea, Oliver Diekmann, Sylvester Eijffinger, Vitor Gaspar, David Laidler, Lars E. O. Svensson, and Geoffrey Wood.
2. See Bordo and Jonung (1987).
3. Velocity (V) defined as the ratio of nominal income (Y) to the money stock (M) is also the inverse of the demand for money defined as the ratio of the money stock to nominal income (often referred to as Cambridge K). Thus

- there is a close link between money demand analysis and the study of velocity.
4. We defined M_2 as the sum of currency demand and time deposits. It was the only money measure available for all the five countries and for the entire period we originally studied.
5. We have used data from Metcalf, Redish, and Shearer (1998) to construct Chart 2.
6. For helpful elucidation on the intricacies of recent British monetary aggregates we thank David Willoughby. We have not adjusted the data in Chart 3 for a large downward shift in the level of velocity in 1955.
7. See, for example, Goldfeld (1976) and Judd and Scadding (1982).
8. King (2002) quotes a former governor of the Bank of Canada as remarking "we didn't abandon the monetary aggregates, they abandoned us."
9. The theory of inflation targeting has been developed in a number of recent studies, see for example Svensson (1999) for a brief survey of the field. The roots of inflation targeting may be traced back to Knut Wicksell's theory of price level determination and his monetary policy rule of price level stabilization. In Wicksell's model money and credit are determined endogenously as a result of the interaction between the real rate and the interest rate (the bank rate) set by the central bank.
10. Laidler (1999) remarks that the Bank of Canada has adopted a forecast model that does not even include any monetary aggregate. Several central bankers have remarked recently on the disappearance of money from monetary policy making. See, for example, King (2002) and Meyer (2001). See, for example, chapter 5 in Issing et al. (2001) in defence of the ECB's strategy. For a sample of the critique of the strategy see Svensson (2000) and Gerlach (2003).
12. See Laidler (1993) for a summary of the field of money demand studies – a survey that still remains of current interest.
13. This is done predominantly in work by Woodford (1997, 2003). In response to this 'new consensus' concerning the irrelevance of money, Nelson (2003) and Leeper and Rousch (2003) continue to stress the role of monetary aggregates and thus of the demand for money in monetary policy making. See also McCallum (2001).
14. See for example De Grauwe and Polan (2001) and Fischer, Sahay, and Végh (2002).
15. Stram (2001) surveys recent money demand studies. See also Ball (1998, 2002) for the U.S. evidence. Velocity has acquired a new role in the rapidly expanding literature on the contributions of financial development to economic growth. Beginning with Raymond Goldsmith's (1969) work, M/Y , (the inverse of velocity) an important proxy for the growth of the financial system, has been used as a measure of financial development and maturity. This approach is consistent with our interpretation that the fall in velocity is associated with a decline of the barter economy and the rise of commercial banking.

References

- Ball, L. (1998), "Another Look at Long Run Money Demand," *NBER Working Paper Series*, No. 6597.
- Ball, L. (2002), "Short Run Money Demand," *NBER Working Paper Series*, No. 9235.
- Bordo, M.D. and L. Jonung (1987), *The Long-Run Behavior of Velocity: The International Evidence*, Cambridge University Press.
- Bordo, M.D. and L. Jonung (1990), "The Long-Run Behavior of Velocity: The Institutional Approach Revisited," *Journal of Policy Modeling*, pp. 165-197.
- Bordo, M.D., L. Jonung and P. Siklos (1997), "The Common Development of Institutional Change as Measured by Income Velocity of Money: A Century of Evidence from Five Industrialized Countries," *Economic Inquiry*, October, pp. 710-724.
- DeGrauwe, P. and M. Polan (2002), "Is Inflation Always and Everywhere a Monetary Phenomenon?" CEPR discussion paper, no 2841.
- Fischer, S., R. Sahay and C. A. Végh (2002), "Modern Hyper- and High Inflation," *Journal of Economic Literature*, pp. 837-880, September.
- Friedman, M. (1963), *Inflation: Causes and Consequences*, Asia Publishing House, Bombay.
- Gerlach, S. (2003), "The ECB's Two Pillars," *CEPR Discussion Paper Series*, No. 3689.
- Goldfeld, S.M. (1976), "The Case of Missing Money," *Brookings Papers on Economic Activity*, pp. 683-730.
- Goldsmith, R. (1969), *Financial Structure and Development*, Yale University Press, New Haven.
- Issing, O., V. Gaspar, I. Angeloni and O. Tristani (2001), "Monetary Policy in the Euro Area: Strategy and Decision-making at the European Central Bank," Cambridge University Press.
- Judd, J.P. and J. L. Scadding (1982), "The Search for a Stable Money Demand Function," pp. 993-1023, *Journal of Economic Literature*.
- King, M. (2002), "No Money, No Inflation – The Role of Money in the Economy," pp. 162-177, summer, *Bank of England Quarterly Review*.
- Laidler, D. (1993), *The Demand for Money: Theories, Evidence and Problems*, 4th edition, Donnelley Publishing Corp., New York.
- Laidler, D. (1999), "The Quantity of Money and Monetary Policy," working paper 99-5, Bank of Canada, Ottawa.
- Leeper, E. M. and J. E. Rousch (2003), "Putting 'M' Back in Monetary Policy," International finance discussion papers, Federal Reserve Board, no 761, April.
- McCallum, B.T. (2001), "Monetary Policy Analysis in Models without Money," *Federal Reserve Bank of St. Louis Review*, pp. 1-15.
- Metcalf, C., A. Redish, and R. Shearer (1998), "New Estimates of the Canadian Money Stock, 1871-1967," pp. 104-124, *Canadian Journal of Economics*.
- Meyer, L. H. (2001), "Does Money Matter?" The Homer Jones Memorial Lecture, *Federal Reserve Bank of St. Louis Review*, pp. 145-60.
- Nelson, E. (2003), "The Future of Monetary Aggregates in Monetary Policy Analysis," *Journal of Monetary Economics*, pp. 1029-1059, July.
- Siklos, P. (1993), "Income Velocity and Institutional Change: Some New Time Series Evidence, 1870-1986," pp. 377-92, August, *Journal of Money, Credit and Banking*.

- Stram, S. S. (2001), "A Survey of Recent Empirical Money Demand Studies," *IMF Staff Papers*, Vol. 47, No. 3, IMF, Washington, DC.
- Svensson, L. E. O. (1999), "Inflation Targeting as a Monetary Policy Rule," *Journal of Monetary Economics*, pp. 606-654.
- Svensson, L. E. O. (2000), "What is Wrong with the Eurosystem's Money-Growth Indicator, and What Should the Eurosystem Do about It?" Briefing paper for the Committee on Economic and Monetary Affairs (ECON) of the European Parliament.
- Woodford, M. (1997), "Doing without Money: Controlling Inflation in a Post Monetary World," No. 6188, NBER Working Paper Series.
- Woodford, M. (2003). *Interest and Prices: Foundations of a Theory of Monetary Policy*, Princeton University.