

FISCAL DOMINANCE AND MONEY GROWTH IN ITALY: THE LONG RECORD

by

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Abstract. Fiscal dominance, the extent to which government deficits condition the growth of the money supply, has been the prevailing regime in Italian monetary history since political unification in 1861. The nature of the institutional structure linking budget deficits to monetary base creation has changed over time. In the early days, the profit-seeking banks of issue intermittently exceeded the legal ceiling on their outstanding currency in order to lend to the government. Public finance exerted stronger influence on monetary policy, first, in the 1930s and, later, in the 1970s when fiscal dominance reached its high point. In the 1990s fiscal dominance held but in the opposite direction. To meet the provisions of the Maastricht Treaty and qualify for European Monetary Union, Italian policy makers had to grant independence to the central bank and drastically curtail budget deficits.

Key words: budget deficits, fiscal dominance, monetary accommodation, central bank independence.

JEL Classification: E51, E58, N13, and N14.

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I. INTRODUCTION

This paper examines fiscal dominance in Italian monetary history, that is, the influence of government deficits on the growth of the money supply since the formation of the Italian state in 1861. Fiscal dominance is the key theme in our monetary history (Spinelli and Fratianni 1991; Fratianni and Spinelli 1997). It can be traced to the behavior of early banks of issues such as the Banca Nazionale degli Stati Sardi (created in 1850), the Banca Nazionale nel Regno d'Italia (1867) and the Banca d'Italia (1893). Each one sought to become the sole bank of issue, and this quest for the monopoly right of issue implied subservience to the political authority. Operationally, subservience meant that the monopoly bank would grant ready and “cheap” access to credit to the government.

The Banca Nazionale in the State of Piedmont successfully negotiated with the powerful Prime Minister, Camillo Benso Cavour, for the right to serve as the state’s banker and make its notes legal tender. The same bank, after the political unification of Italy, ceaselessly undermined the other banks to emerge as monopoly bank of issue. This goal was finally achieved in 1926 by the Banca d'Italia (BI), the successor of Banca Nazionale. The BI continued to push for more power, increasing its control over the entire banking system which it gained with the Banking Law of 1936. Its authority was further expanded after the second World War (De Cecco 1976). Yet, as these powers increased so did BI's dependence on the Treasury. Fiscal dominance, or dependence on Treasury, meant that interest rates had to be kept low so as to reduce the cost to Treasury of financing budget deficits. Dependence also meant that interest rate targeting, rather than targeting monetary aggregates, was the preferred operating procedure.

The height of fiscal dominance was reached under the Governorship of Guido Carli (1960-1975). In addition to monetizing a large share of budget deficits, the BI put in place a complex web of controls and regulations to redirect national saving away from the private sector and towards government, while keeping interest rates low relative to inflation rates. Banks were subject to ceilings on bank loans and to minimum levels of purchases of government securities. An intricate web of regulations was enacted to prevent people from diversifying assets across currencies. Controls on

exchange rates and capital movements were increasingly tightened to the point that the freedom to travel abroad was seriously compromised. Such actions were readily justified as the necessary price to keep interest rates below the level prevailing abroad and to allow the government to fund the excess of expenditures at "reasonable" cost. Yet, the low cost of borrowing made it easy for the political authority to postpone needed adjustment. Hard decisions were not taken and budget deficits rose. Fiscal dominance left a legacy of fiscal profligacy and low credibility of the BI. The "divorce" agreement of 1981 re-established some of the credibility BI had lost during the troubled 1970s. Credibility was again lost in September 1992, when Italy left the European Monetary System (EMS) following a severe currency crisis. The Maastricht Treaty and the conditions to qualify for stage three of the European Monetary Union (EMU) imposed tight constraints on Italian policy makers. The BI was finally made independent of the executive and budget deficits had to be drastically curtailed.

The fiscal dominance hypothesis has been challenged by some authors (Toniolo 1989; Carli 1993; Tattara and Volpe 1995) and confirmed by others (Cotula and Spaventa 1993; Gallo and Otranto 1998; and Favero and Spinelli 1999). We revisit the issue for two reasons. First, we want to test the hypothesis more "formally" than was done in the *Monetary History of Italy*. The methodology of the *History* is more of descriptive statistics and causal narrative than formal hypothesis testing. The causal narrative revealed many of the underlying forces at work. Here, we want to complement that approach with formal hypothesis testing. The second reason for revisiting the issue is to consider the evidence in its totality, that is from political unification to the present.

The major conclusion of the paper is that fiscal dominance is the prevailing regime in Italy. Fiscal dominance is not only operative in much of post-World War II period, but also in the thirties, the twenties, in the so-called gold standard period, and even more so during wars. The paper is organized as follows. Section II reviews the literature on fiscal dominance, placing special emphasis on the studies that have been written after the appearance of our *History*. In Section III we test the hypothesis of fiscal dominance. We proceed in two stages, starting with money growth accounting and

then establishing a causal link from budget deficits to the growth rate of the Treasury monetary base.

II. FISCAL DOMINANCE: A REVIEW OF THE LITERATURE

The starting point of the theory of fiscal dominance is the intertemporal government budget constraint (King and Plosser 1985). Define the year-t budget deficit as:

$$(1) \quad S_t = (1 + i_{t-1})S_{t-1} + GE_t - T_t - TR_t ,$$

where S = interest-bearing government securities, GE = total government expenditures, excluding interest payments, T = total tax revenues, and TR = transfer to government by the central bank (i.e., seigniorage).

The central bank issues non-interest bearing liabilities in the form of monetary base, MB , against which it lends to government, $MBTR$, non-government units, $MBOT$, and the rest of the world, BF .

The central bank's assets –the source side of the monetary base– earn an interest flow, which is returned to the Treasury, after deducting operating expenses. In fact, as can be seen from equation (2),

$$TR_t = i_{t-1}(MBTR + MBOT + BF)_{t-1} :$$

$$(2) \quad MBTR_t + MBOT_t + BF_t + TR_t = \Delta MB_t + (1 + i_{t-1})(MBTR + MBOT + BF)_{t-1} .$$

Substitute (2) into (1) and simplify by setting $MBOT$ and BF equal to zero; deflate all nominal magnitudes by nominal national income; let $P_{t-1}/P_t (1 + i_t) = 1 +$ the real rate of interest; solve forward; and impose the constraint that $(s-mbtr)_{t+\infty} = 0$. The resulting equation is:

$$(3) \quad (s - mbtr)_t + \sum_j r_{tj} (ge_{t+j}) = \sum_j r_{tj} (t_{t+j} + \Delta mb_{t+j}) ,$$

where lower-case letters refer to variables deflated by national income and ρ is the ratio of one plus the growth rate of real national income divided by one plus the real rate of interest. Equation (3) is virtually identical to equation (4) in King and Plosser (p. 169). Fiscal dominance occurs when government can determine the stock of debt, $mbtr$ and the path of total expenditures and taxation. Under these conditions, government, by raising the permanent level of expenditures without at the same time raising taxes, can affect the current and future flows of the monetary base and, hence, of the money stock and the inflation rate. This is the central message of Sargent and Wallace's "Some Unpleasant Monetarist Arithmetic" (1981): fiscal dominance implies an intertemporal positive correlation between government budget deficits and money growth.

A positive correlation between money growth and government deficits, however, can take place also in the absence of fiscal dominance (Barro 1979; Joines 1985, p. 331). If government were to target real as opposed to nominal values of government debt, nominal debt would rise in proportion to the price level; so long as money growth and inflation are positively correlated, deficit and money growth would also be positively correlated, in the absence of debt monetization by the central bank. So, the test of fiscal dominance must include (i) evidence of monetization and (ii) an intertemporal causal relation from government deficits to monetary base growth.

Evidence on fiscal dominance is mixed. Joines (p. 331) reviews the evidence for the United States and finds almost an equal number of authors finding and failing to find a positive relation between government deficits and money growth or the growth of the monetary base. Joines, relying on annual data from 1866 to 1983, arrives at the conclusion that:

...[there is] no relation between non-war federal deficits and the growth of high-powered money. High-powered money growth does appear to be positively associated with war spending and possibly with the unemployment rate...The data are consistent with the view that the government has set its non-war real deficit and the growth of high-powered money independently of each other and has let its nominal deficit drift upward over time in part to offset the inflation-induced depreciation in the real value of its debt and in part because its real deficit has grown (p. 330).

Barro (1987) examines the impact of temporary changes in government purchases on a variety of variables, including the growth of money in the United Kingdom from 1701 to 1918. These changes are shown to raise money growth and inflation only when the gold standard was suspended (from 1797 to 1821 and from 1914 to 1918). It should be noted, however, that the U.K. government was relatively well behaved and ran budget deficits primarily during wars, with these deficits being highly correlated with military spending (Barro 1987, Fig 9 on page 240). King and Plosser (pp. 186-87) fail to find a contemporaneous correlation between seigniorage (Δm in our notation) and deficits for the United States, the United Kingdom, France, Germany, Switzerland, Japan, Spain, Mexico, Chile, and South Korea, but find it for Argentina, Brazil, Mexico, and Italy. About Italy, these authors have this to say:

Italy stands out as the sole exception among those eight countries for whom we have data on both deficit measures, displaying a positive and significant (at the five percent level) regression coefficient in each case. The correlation for Italy is perhaps the result of a treasury bill price support policy that the Banca d'Italia employed during at least a portion of our sample period... (p.187).

As we will see later, there is much more than interest-rate pegging in the Italian story.

Burdekin (1987) estimates Barro-Gordon type reaction functions for the growth of the monetary base, with deficits entering separately and interactively with the growth of real government purchases and price level as well as with the level of the short-term interest rate and unemployment rate for Canada, France, the U.K., and West Germany in the period 1961-1983. The main result is that monetary policy in these four countries becomes more accommodating as the budget deficit rises. The study may not be conclusive in light of the limited sample period and the tendency of reaction functions of being unstable over time.

Studies on Italy

Several studies, mostly following our 1991 *History*, have dealt with the issue of fiscal dominance. We review in this section the most relevant ones, starting with those that use the longest

time horizons and then those that consider specific sub-periods. Two studies look at the long span of Italian monetary history and both of them corroborate the hypothesis of fiscal dominance. Favero and Spinelli (1999), using data for the period 1875-1994, find that money growth is endogenous relative to budget deficits, that positive differential between Italian and foreign inflation is explained by the higher Italian money growth, and that fiscal dominance begins to break down with the Governorship of Paolo Baffi in 1975. Gallo and Otranto (1998), using data for the period 1863-1994, arrive at similar conclusions, but in particular find that government spending is a critical factor in explaining the expected growth of the money stock.

Tattara and Volpe (1995) test and reject what they believe to be fiscal dominance for the period 1862-1913. The heart of the empirical work of these two authors is a reduced-form equation of a model where neither government expenditures, nor taxes, nor budget deficits have any role to play. Furthermore, in their model the domestic interest rate is determined by uncovered interest rate parity, despite strong evidence that this parity did not hold for Italy during the gold-standard period.

Many of the studies on specific sub-periods were financed or sponsored by the BI to celebrate the institution's first centennial; we refer to those as the centennial series.¹ Toniolo (1989), in a volume of the centennial series, examines the monetary consequences of World War I and comes to the conclusion (pp. 12-13) that "...the contribution of monetary financing of war-time government spending was relatively modest, taken due consideration of the circumstances." This assessment appears to be in conflict with the analysis in another volume in the centennial series, written by Cotula and Spaventa (1993, pp. 36-37):

During the war and in the first years of its aftermath the yield on government securities –particularly, the new issue yield on long-dated securities-- had exceeded for long periods the level of the official interest rates. This structure of rates favored the placement of public debt, also because economic agents could rely on banks of issue to extend credit against the value of the subscribed bonds (cf., for example, document 21); the support to the placement of public debt through discounts and advances made, however, uncertain the net effect on monetary circulation of the new issues of government securities.

¹ The collection of volumes is known as the Historical Collection of the BI ("Collana Storica della Banca d'Italia) and has been published by Editori Laterza.

The dominance of government on money matters also emerges in a passage written by Bonaldo Stringher, Director General of the BI, in the Bank's 1917 annual report: "The Banca was aware of the State's needs to give to currency production the same impulse as the mechanical industry has given to the production of arms." (Toniolo 1989, pp.16-17).

Guarino and Toniolo (1993), also part of the centennial series, divide the BI's inter-war policy in three different phases. In the first phase, from 1920 to 1924, the BI acted primarily as a lender of last resort in an effort to prevent large-scale banking and industrial failures; in the second phase, extending to 1930, the Banca accommodated government objectives and directives; and in the third, extending to 1936, the BI acted as a mere technical agent without ever participating in the formulation of strategic decisions. In essence, the BI, in the inter-war period, was either passive or accommodated government policy. The two authors (p. 17) explain these outcomes as emerging from policy makers' preferences:

The Italian political elite, and this has been true up to recent times, had a rather pessimistic view of the solidity of the social fabric, the stability of the institutional framework, and even of the stability of democracy itself...Consequently, if forced to make a decision, this elite showed a higher propensity to accept the risks connected with monetary instability -- which, in their view, could undermine the social fabric in an indirect way and in the long run-- than the risks associated with instability of the real sector whose damages appeared to be immediate, violent, and irreversible. In the period under consideration, the Banca d'Italia shared this view.

This passage is important in that it tries to provide a utility-based explanation of fiscal dominance. The elite, both in government and in the central bank, had a gloomy assessment of the stability of the real sector of the economy. It was up to public finance to provide stability. Money was simply an extension of public finance, complementary in achieving the ultimate objective of sustaining economic activity and preserving social peace. If this is true, then fiscal dominance cannot be a temporary phenomenon, identified with particular circumstances or specific periods of history. On the contrary, fiscal dominance is bound to be long-lasting. It will change either because of the emergence of a new paradigm --for example, the acceptance of the stability of the real sector-- or because of a change in

regime –for example, the Maastricht Treaty that imposes on member governments the establishment of independent central banks and tight ceilings on budget deficits–.

The inter-war period is also analyzed by Cotula and Spaventa (1993), whose main thesis is that the BI had little or no control over money, a situation that stemmed from the fact that government, and not the Bank, had jurisdiction over the determination of short-term interest rates. We read this as evidence supporting fiscal dominance. They write (p. 4):

Over the period monetary policy follows a parabola: constrained at the start by the needs of the real economy and public finance, gains autonomous dignity with the reforms of 1926 and 1928, only to find itself enslaved to the orders of the [Fascist] regime, in defiance of the very spirit of the reforms.

In reviewing the Cotula-Spaventa study, Quadrio Curzio (1994, pp. 89-90) interprets the history of the BI as a search for independence:

The regime of fiscal dominance that characterizes large part of the period under examination –to which the authors [Cotula and Spaventa] give less importance than other researchers, such as Fratianni and Spinelli-- does not imply a condition of full dependence on the Treasury's actions. Several times Stringher opposes proposals by Stefani [Treasury] and Volpi [Finance] and conflicts emerge relative to the determination of the interest rate on government securities and the definition of the ultimate objectives of a central banker.

The fact that the BI tried to stand up to the political authority tells us very little about who won the argument. Quadrio Curzio (p. 90) does admit that “fiscal dominance becomes more pronounced during the regime of Thaon di Revel [Finance Minister, appointed in 1935]. In 1936 a government decree establishes that BI financing to the government is subject to no upper limit and that government can overdraft its account with BI.”

In the mid thirties the Fascist regime stressed the objective of national economic autarky, which became the policy of the government as a consequence of the invasion of Ethiopia and the imposition of economic sanctions by the international community in October of 1935 (Caracciolo 1992, p.7, centennial series). Autarky meant total intrusion of the State in the economic life of the country. Protectionism and economic militarization were two specific outcomes of this intrusion. The BI, as

many other institutions in Italy, felt the effects of the new regime. The Banca lost additional autonomy, such as the prerogative of setting the discount rate (in 1936), which it had gained just eight years earlier, and any control whatsoever over monetization of government deficits (Caracciolo, p. 106, Appendix authored by Cosma Onorio Gelsomino). In sum, the period spanning from the mid thirties to the end of World War II provides a textbook example of the legal framework for sustaining fiscal dominance.

In fact, the Fascist legacy extends beyond the end of the war, all the way to the early nineties. In the seventies fiscal dominance reaches the high point in non-war times, sparked by a profligate fiscal policy and a very accommodating central bank (Fратиanni and Spinelli 1997, ch. 7). Representative of this climate is a famous passage written by Governor Guido Carli in the 1973 Annual Report of the Bank (p. 418):

We have asked ourselves whether the Banca d'Italia would have been able or could have refused to finance public deficits...Such an action would place the government in the impossibility of paying salaries to public servants...and pensions to people. While this action would have the [technical] appearance of a monetary policy initiative, in practice it could be construed as an act of subversion, for it would bring about a paralysis in the institutions.

In defense of his policies, Carli (1993), in his memoirs, raises first the theme of the BI as the last bastion of defense of market economics and, then, the theme of social peace:

The animal instincts in society erupted then, fighting strenuously against the acceptance of the principles of the market economy...The Banca d'Italia opposed the construction of the mosaic of this material Constitution, based on the relentless expansion of government in the economy...It opposed it within the bounds of the law (p. 259).

How is it possible to evaluate the [monetary] policy of the early seventies –judged by some, erroneously, as lax-- without considering the street demonstrations of fourteen year olds that each morning I was observing from my office in via Nazionale? Public opinion was shocked by the mysterious episodes inspired by the strategy of conflict. Should we have ignored it?...The monetarist is horrified by this type of reasoning. He believes that the central banker must have only eyes for the graph showing the time path of the growth of the money stock...The ... monetarist lives in a vacuum of history and substance, yet he expects heroic decisions from the central banker. If his graph calls for a stop to the growth of money, he must do it even if such an action could instigate a million unemployed, even if there are Red

Brigades, even if disruptions prevail in the work place, even if the “autonomous” [groups] are shooting in the street (p. 261).

According to Carli, the central banker is not simply the guardian of the purchasing power of money. He must rise to the role of *deus ex machina* to preserve social peace or prevent the real economy from disintegrating, regardless of the monetary consequences. The costs of monetary uncertainty, the passage above suggests, are far smaller than the costs of real sector uncertainty; never mind that the two may not be so neatly separated. The ultimate roots of fiscal dominance in Italy may be just those preferences that Guarino and Toniolo indicated in the quoted passage above. Regardless of the reasons, there should be no doubt that fiscal dominance found fertile ground in Italy of the sixties and the seventies.

In the eighties, the pendulum finally began to move in the other direction. Two important events were responsible for this turn of events: the so-called divorce of 1981 and the Maastricht Treaty. The ‘divorce’ refers to a decision taken by government to release the BI from the obligation of acting as a residual buyer in the government securities auctions. Epstein and Schor (1989) believe that the decision was part of a longer trend to curb the power of labor unions and other strong pressure groups. We give more credit to the farsightedness of Treasury Minister Beniamino Andreatta, a Professor of Economics at the University of Bologna, than to an anti-union strategy. The Maastricht Treaty, as we have mentioned, prescribed both fiscal discipline and central bank independence (Fратиanni et al. 1992). It is somewhat ironic that the BI achieved full independence a few years before becoming part of the larger European System of Central Banks.

III. TESTS OF FISCAL DOMINANCE

In this section we test fiscal dominance in two different stages. First, we assess the quantitative impact of the Treasury component of the monetary base, MBTR, on money growth using the methodology of money growth accounting. Secondly, we concentrate on the ‘causal’ relationship between budget deficits and the growth of MBTR. Information on the construction of the monetary

statistics, data gathering of non-monetary statistics, data consistency or lack thereof, and Italian banking structure are available in our *History* (Spinelli and Fratianni 1991, chs. 2 and 3; Fratianni and Spinelli 1997, ch. 1). Our sample period covers the entire history of the modern lira, from political unification in 1861 to 1998, just days before the launching of EMU. The frequency of the data is annual.

Over this 138-year span of history, Italy has lived through several monetary regimes: it has swung from the gold standard to inconvertible fiat money; alternated periods of fixed exchange rates with periods of flexible rates; experimented alternatively with interest rate, total domestic credit and monetary base targeting; joined the EMS and left it; and is now a member of EMU. Over the same span, banking and financial structure has evolved. At the beginning, Italy had several financial institutions acting as banks of issue, each one in competition with the other (Fratianni and Spinelli 1985). The BI was created in 1893 as a result of the merger of Banca Nazionale nel Regno d'Italia with Banca Nazionale Toscana and Banca Toscana di Credito per le Industrie e il Commercio d'Italia. The BI acquired the liabilities of the failed Banca Romana and competed with Banco di Sicilia and Banco di Napoli as a bank of issue until 1926. In that year it acquired the monopoly of issue. The UIC (the Italian Exchange Office) was created in 1945 with complete authority to regulate the foreign exchange markets and manage the country's foreign reserves and exchange rates.² Although there is a formal separation between the BI and the UIC, in practice the two are intertwined. The Governor of the BI is the ex-officio President of UIC; the Bank in addition provides the bureaucratic apparatus for UIC to execute interventions in the foreign exchange markets. So integrated are the activities of these two authorities that their balance sheets are often shown on a consolidated basis. In addition to banks of issue and UIC, since 1945, two other institutions act as monetary authorities in modern Italy and can create or destroy monetary base: Treasury and the Cassa Depositi e Prestiti (Cassa DD.PP). The Cassa DD.PP. is an independent unit of Treasury that grants loans to local governments and obtain funds

² UIC succeeded the Istituto Nazionale per i Cambi con l'Estero created in 1917.

by accepting postal deposits. As in the case of UIC, the independence of Cassa DD.PP. is only formal; in fact, the minister of the Treasury is ex-officio the chairman of the Board of Directors of Cassa DD.PP.

Treasury, representing government, has been clearly the dominant actor within the set of institutions that we have called monetary authorities. The activity of the BI, until very recently, has fallen under the direct jurisdiction of the Treasury minister who also presided the Interministerial Committee for Credit and Saving (CIRC), the highest decision-making body in matters of saving, credit and foreign exchange in Italy. Both law and customs, however, gave the Governor of BI a degree of policy freedom. The policy freedom or independence of BI was in no way comparable to that of the Bundesbank (Alesina and Summers 1993; Fratianni and Huang 1992).

The money stock is defined as the sum of the monetary base held by the public plus all bank deposits, regardless of whether they are on demand or at term. We consider the distinction between demand and term accounts somewhat artificial in Italy because the checking account did not develop into an important medium of exchange. More importantly, we have been unable to identify over the entire period the relative costs of holding sight vs. term deposits to such a degree to test for differences in behavior. This definition of the monetary base used is consistent with that employed by the BI for the period after World War II. Our presentation has deliberately maintained this conformity. Postal deposits are part of the monetary base (Fratianni 1972). However, in the 1980s the BI opted to downplay the monetary base inclusive of postal deposits and that definition eventually disappeared from its annual reports. In the past we have reported results using both the inclusive and exclusive definitions (see, for example, Fratianni and Spinelli 1997, Table 2.2), but here we shall limit ourselves only to the inclusive definition. A list of variables and sources is found in the Appendix.

Money growth accounting

Define the money stock, M , as the monetary base, MB , times the money multiplier, m . The

multiplier, in turn, depends on three behavioral ratios: k , reflecting decisions of the non-bank public to allocate money-like assets between monetary base, BP , and bank deposits, D ; rr , reflecting decisions of the monetary authorities to impose monetary base requirements, BR , on bank deposit liabilities; and re , reflecting decisions of the banks concerning their liquidity, BE , in relation to bank deposits.

$$(4) \quad M_t = m_t MB_t,$$

$$(5) \quad m_t = (1 + k_t)/(k_t + rr_t + re_t),$$

$$(6) \quad k_t = BP_t/D_t,$$

$$(7) \quad rr_t = BR_t/D_t,$$

$$(8) \quad re_t = BE_t/D_t.$$

This relatively simple structure –represented by equations (4)-(8)-- provides the basis for money growth accounting (Friedman and Schwartz 1963, pp. 794-97; Brunner and Meltzer 1964; Cagan 1965). That is, the growth rate of M can be decomposed into the growth of the multiplier and the growth of the monetary base; in turn, these can be expressed in terms of the contributions of k , rr , re , $MBTR$, $MBOT$ and BF and their interactions; that is:

$$(9) \quad \ln m_t - \ln m_{t-1} = c(k) + c(rr) + c(re) + c(com1),$$

$$c(k) = \ln(1+k_t) - \ln(1+k_{t-1}) - \ln(k_t+rr_{t-1}+re_{t-1}) + \ln(k_{t-1}+rr_{t-1}+re_{t-1})$$

$$c(rr) = -\ln(k_{t-1}+rr_t+re_{t-1}) + \ln(k_{t-1}+rr_{t-1}+re_{t-1})$$

$$c(re) = -\ln(k_{t-1}+rr_{t-1}+re_t) + \ln(k_{t-1}+rr_{t-1}+re_{t-1})$$

$$c(com1) = \ln m_t - \ln m_{t-1} - [c(k) + c(rr) + c(re)].$$

$$(10) \quad \ln MB_t - \ln MB_{t-1} = c(MBTR) + c(MBOT) + c(BF) + c(com2),$$

$$c(MBTR) = \ln(MBTR_t+MBOT_{t-1}+BF_{t-1}) - \ln(MBTR_{t-1}+MBOT_{t-1}+BF_{t-1})$$

$$c(MBOT) = \ln(MBTR_{t-1}+MBOT_t+BF_{t-1}) - \ln(MBTR_{t-1}+MBOT_{t-1}+BF_{t-1})$$

$$c(BF) = \ln(MBTR_{t-1}+MBOT_{t-1}+BF_t) - \ln(MBTR_{t-1}+MBOT_{t-1}+BF_{t-1})$$

$$c(com2) = \ln MB_t - \ln MB_{t-1} - [c(MBTR) + c(MBOT) + c(BF)].$$

We recall from equation (2) that $MBTR + MBOT + BF = MB$. $MBTR$ is the Treasury component of the monetary base and the variable of special interest for our hypothesis of fiscal dominance. $MBOT$ includes, among other things, discounts and advances to banks, and BF is the foreign

component of the monetary base. The notation $c(x)$ denotes the contribution of $x = k, rr, re, MBTR, MBOT, BF$ to the growth of the money stock. In addition, given that changes in the variables are discrete, two interaction terms arise: "com1" capturing the interactions of the multiplier's determinants, and "com2" the interaction of the monetary base's determinants.

Table 1 shows period averages of the growth rate of money and of each $c(x)$. For example, for the entire sample period 1862-1998, MBTR accounts for 6.98 percentage points of the average money growth, approximately 70 per cent of all contributions. In addition to the complete sample, we have included: a war period consisting of 15 years (see Appendix for a complete list of years); a peace period that excludes those 15 war years; the period 1862-1939 excluding war years; the period 1946-1998; the fixed and flexible exchange rate periods (see Appendix for a complete list of years); and business cycle expansion and contraction phases (again, see Appendix for a list of these phases).

During wars governments pursue the objective of victory or survival and all other considerations are secondary. Military expenditures rise and taxation does not keep up with the increase in expenditures. Given the temporary nature of the expenditures, war financing tends to be accompanied by much greater money creation and inflation. In Italy, money growth during war years was three times as large as in peace years. In addition, we would expect the relative contribution of MBTR (defined as the period average of $c(MBTR)$ divided by the period average of money growth, DLM) to be significantly higher during wars than in times of peace: in fact, it is twice as high. We are much less surprised by the war period results than by those during peace; the Treasury component of the base is the main engine of money growth in the long run.

The distinction between pre- and post-World War II can be justified in terms of difference in the conception of macroeconomic policy. After World War II, Keynesian macroeconomics became the prevailing paradigm in Italy, as in many other countries, and policy makers were inspired by the implications of this paradigm to follow activist policies. DLM is almost three times higher after WWII than before. Surprisingly, there is a stronger evidence of counter-cyclical monetary policy in the pre- than in the post-WWII period. The money growth decomposition reveals one possible reason: MBTR behaved much more counter-cyclically before WWII than after. To the extent that money growth was

significantly influenced by budget deficits –i.e., to the extent that fiscal dominance was operative-- the counter-cyclical behavior of the growth MBTR before WWII and its cycle-neutral behavior after WWII can explain the differences in the cyclical behavior of DLM. The strength of this argument is potentially diminished by the fact that the pre-WWII period includes nine years of war, whereas the post-WWII period includes none. Since cyclical movements are much less important than trends we do not pursue the matter any further.

Finally, over the whole sample there is an almost fifty-fifty split between fixed and flexible exchange rates. In 66 years exchange rates were fixed or managed through central bank interventions in the exchange market: 1862-1865, 1884-1891, 1904-1914, 1928-1934, 1951-1970, 1979-1991, and 1997-1998. In the remaining 71 years exchange rates were flexible. Average money growth under flexible rates was, on average, 60 per cent higher than under fixed rates. The higher growth of money was matched by a comparable behavior of the Treasury component of the monetary base. This evidence is consistent with the exchange rate constraint as “tying Treasury’s hands.” But Treasury untied its hands –that is, it lets go of the exchange rate constraint– when fiscal policy was profligate; in turn, a more profligate Treasury, under fiscal dominance, translated into higher monetary base and higher growth rate of money.

[Insert Table 1]

Table 1
Money growth and decomposition: 1862 -1998
(annual percentage changes, period averages)

PERIOD	DLM	c(k)	c(rr)	c(re)	c(com1)	c(MBTR)	c(MBOT)	c(BF)	c(com2)
1862-1998	10.08	0.58	0.18	0.12	-0.02	6.98	-0.47	1.56	1.14
Peace years, 1862-1998	8.46	0.92	0.20	0.13	-0.02	4.50	-0.06	1.75	1.03
War years, 1862-1998	23.23	-2.17	0.00	0.04	0.01	27.11	-3.78	-0.02	2.05
Peace years, 1862-1939	4.66	1.05	0.00	0.03	0.00	1.84	-0.47	0.73	1.48
1946-1998	13.42	0.76	0.47	0.26	-0.05	7.98	0.47	3.09	0.45
Fixed exchange rates	7.67	0.27	0.21	0.36	0.00	5.07	-0.44	1.70	0.50
Flexible exchange rates	12.31	0.88	0.15	-.11	-0.03	8.76	-0.50	1.43	1.74
Expansions, 1862-1939	4.74	0.46	0.00	0.06	0.02	0.91	1.71	0.43	1.16
Contractions, 1862-1939	7.74	0.94	0.00	0.00	-0.02	9.01	-5.62	0.90	2.53

Expansions, 1949-1998	12.80	0.76	0.49	0.39	-0.06	7.84	0.34	2.60	0.44
Contractions, 1949-1998	15.52	0.75	0.38	-0.22	-0.00	8.47	0.93	4.76	0.46

Note: the growth of money, DLM, is equal to $c(k) + \dots + c(\text{com}2)$; see equations (9) and (10) in the text.

Causality between Budget Deficits on Treasury Base

An empirical test of fiscal dominance requires a determination of the direction of causality between budget deficits and the change in the Treasury component of the monetary base. Fiscal dominance implies that changes in bmtr react to budget deficits as predicted by a strict Granger (1969) causality relationship. Two-way causality is not an implication of a fiscal dominance because budget deficits and the growth of the monetary base may be correlated independently of fiscal dominance. In Barro's scenario, as we have already discussed, governments can target real government deficits and adjust nominal deficits to the evolution of the price level; to the extent that price level changes are correlated with changes in the monetary base, we would observe a positive correlation between government deficits and the growth of the monetary base, in the absence of any effects of fiscal dominance.

We propose a test based on the following VAR model:

$$(11) \quad \text{def}_t = c_1 + A_{11}(L) \text{def}_t + A_{12}(L) \Delta \text{mbtr}_t + \varepsilon_{1,t}$$

$$(12) \quad \Delta \text{mbtr}_t = c_2 + A_{21}(L) \text{def}_t + A_{22}(L) \Delta \text{mbtr}_t + \varepsilon_{2,t}$$

where L is the lag operator, $A_{11}(L) = a^0_{11} + a^1_{11}L + a^2_{11}L^2 + \dots$ and similarly for the other three A s, c s and ε s are parameters, $\text{def} =$ budget deficit divided by national income, $\Delta \text{mbtr}_t = \text{mbtr}_t - \text{mbtr}_{t-1}$, $\varepsilon_{1,t}$, $\varepsilon_{2,t}$ are residuals with constant variance, serially independent and uncorrelated with each other.

The two-equation model allows to study the causal relationship between def and Δmbtr (Hamilton 1994, pp. 309-11). According to Granger, def causes Δmbtr if the lagged values of def in (11) improve the forecast of Δmbtr_t relative to a regression where only the lagged values of Δmbtr

appear on the right-hand side; and the lagged values of $\Delta mbtr$ in equation (12) do not improve the forecast of def_t relative to a regression where only the lagged values of def appear on the right-hand side.

That is, Granger causality from def to $\Delta mbtr$ imposes two restrictions: $A_{12}(L) = 0$ in (11) and $A_{21}(L) \neq 0$ in (12).

Our statistical procedure is carried out in three steps. In step one we test that def and $\Delta mbtr$ are stationary; in the second we determine the optimum number of lags; in the final step we estimate the system (11)-(12). The null hypothesis of a unit root in the two series was rejected using the Dickey-Fuller (1979) test. The corrected t-values are -6.0 for def and -3.54 for $\Delta mbtr$, both of which are significant at the 1 per cent level. Rejection held when we added lagged values of the series in the test.³ In sum, there is evidence that both def and $\Delta mbtr$ are stationary. A likelihood ratio test was employed to determine the optimal and common number of lags for both def and $\Delta mbtr$ (Hamilton 1994, pp. 296-8);⁴ the test done for the entire sample period revealed that $L=3$.

Finally, we estimated system (11)-(12) for the entire period, the entire period without war years, the period up to 1992 without war years, and the entire period excluding both interwar and war years. The objective underlying the different sample periods was to check for stability of the fiscal dominance hypothesis. War years were excluded to test for the possibility that fiscal dominance may result from a few years swamping the rest of the observations. The period up to 1992 was selected because the EMS currency crisis of September, 1992 marked a watershed in Italian economic policy. After the lira exited the EMS, the government implemented fiscal austerity and the BI adopted an inflation targeting strategy aimed specifically at reducing the inflation differential with respect to Germany. The strategy paid off in that Italy qualified for stage three of EMU.

The estimates of system (11)-(12) are shown in Table 2. Critical for the hypothesis of fiscal dominance are the F values relating to the right-hand side variables of the two equations. The first of

³ This is the Augmented Dickey-Fuller test; see Doan (1992), RATS User's Manual, p. 6-20.

⁴ See RATS User's Manual, p.8-7.

the two identifying restrictions, $A_{12}(L) = 0$, cannot be rejected at the 5 per cent level; at the 10 per cent level it can be rejected only in the last of the four sub-samples, the one excluding interwar and war years. The second identifying restriction, $A_{21}(L) \neq 0$, cannot be rejected at the 5 per cent level. The inference from Table 2 is that fiscal dominance cannot be rejected at the 5 per cent level of statistical significance. There is some evidence, however, that the interwar years have been more prone to fiscal dominance than the rest of the years as a whole. In fact, when the interwar years are excluded from the sample, the identifying restriction $A_{12}(L) = 0$ can be rejected at the 5 per cent level of significance but not at the 10 percent level.

[Insert Table 2 here]

Corroboration of fiscal dominance comes from the decomposition of the forecast error variance due to innovations in Δdef and $\Delta mbtr$ (see Table 3). In the variance decomposition, the fiscal shock precedes the monetary base shock because, according to the hypothesis, Treasury first projects the size of the deficit and then requests monetization from the central bank.⁵ Table 3 shows that more than 90 per cent of the fiscal shock impacts Δdef , whereas only between 60 and 70 per cent of the monetary base shock impacts $\Delta mbtr$, a finding that is consistent with the budget deficit being exogenous with respect to the Treasury component of the monetary base.

We supplement our empirical tests with a graph showing the relationship between Δdef and $\Delta mbtr$ over the entire period. This picture is very suggestive of the extent of budget deficit monetization in Italian monetary history. Even after 1992, when the BI became independent of government –to satisfy the provisions of the Maastricht treaty– one cannot refute the hypothesis of fiscal dominance. The counterfactual is what would have happened had the government continued its policy of fiscal profligacy in the face of Maastricht. Fiscal dominance would suggest that Maastricht would have succumbed, just like convertibility succumbed in the gold standard under the pressure of a disorderly fiscal policy.

[Insert Table 3 here]

[Insert Graph 1 here]

⁵ The results of the variance decomposition are sensitive to the order with which the shocks are entered (Hamilton 1994, p. 324).

Table 2
Causality test between budget deficits and Treasury component of the monetary base

Cfr. Equations (11) and (12) in the text

Dependent variable	Sample size	Constant	$A_{j1}(L)\text{def}$ j= 1,2 F values	$A_{j2}(L) \text{ mbtr}$ j=1,2 F values	R^2	DW	Q
def	1865-1998	0.015 t (2.28)**	(52.34)*	(1.31)	0.69	2.03	19.63 (0.97)
Δmbtr	“	0.007 t (1.07)	(3.48)**	(11.51)*	0.40	2.08	45.55 (0.07)
def	1865-1998 without wars	0.011 t (2.27)**	(75.29)*	(1.87)	0.73	1.79	34.02 (0.42)
Δmbtr	“	0.009 t (1.95)***	(2.94)**	(8.50)*	0.30	1.86	10.66 (0.99)
def	1865-1992 without wars	0.011 t (2.35)**	(65.72)*	(1.96)	0.72	1.77	39.84 (0.16)
Δmbtr	“	0.009 t (1.94)***	(3.07)**	(6.96)*	0.31	1.85	10.03 (0.99)
def	1865-1998 without wars and interwar	0.011 t (2.27)**	(83.52)*	(2.53)***	0.77	1.78	35.56 (0.35)
Δmbtr	“	0.008 t (1.73)***	(2.76)**	(9.33)*	0.37	1.81	10.52 (0.99)

Notes: def denotes budget deficit divided by national income, Δmbtr the first difference of mbtr, which is the Treasury component of the monetary base normalized by national income, $A_{11}(L) = a^0_{11} + a^1_{11}L + a^2_{11}L^2$ and for the other three As, t the test that the estimated coefficient is different from zero, F is the test that the a coefficients are equal to zero, R^2 the R^2 corrected for degrees of freedom, DW the Durbin-Watson test for first-degree serial correlation in the residuals, Q the Ljung-Box “portmanteau” test for serial correlation in the residuals (in parentheses the p-value).

* significant at the 1 per cent level, ** significant at 5 per cent level, *** significant at the 10 per cent level.

Table 3
Forecast error variance decomposition

Variable	Sample	Years	Per cent of error due to a shock in		Standard error
			def) mbtr	
def	1865-1998	1	100	0.0	0.058
		5	98.8	1.2	0.101
		10	98.8	1.2	0.106
) mbtr	“	1	25.1	74.9	0.058
		5	38.4	61.6	0.076
		10	40.4	59.6	0.077
def	1865-1998 without war years	1	100	0.0	0.038
		5	96.6	3.4	0.057
		10	96.0	4.0	0.059
) mbtr	“	1	23.8	76.2	0.035
		5	30.5	69.5	0.038
		10	30.6	69.4	0.038
def	1865-1992 without war years	1	100	0.0	0.038
		5	96.1	3.9	0.056
		10	95.3	4.7	0.058
) mbtr	“	1	25.6	74.4	0.036
		5	32.7	67.3	0.038
		10	32.8	67.2	0.038
def	1865-1998 without interwar and war years	1	100	0.0	0.035
		5	95.1	4.9	0.052
		10	93.2	6.8	0.056
) mbtr	“	1	20.2	79.8	0.032
		5	28.9	71.1	0.035
		10	29.5	70.5	0.035

Graph 1

IV. SUMMARY AND CONCLUSIONS

The bulk of long-run money growth in Italy was explained by the growth of the monetary base, which, in turn, was propelled by the growth of the Treasury base. The main thesis of our *History* is that Italian monetary authorities have behaved subserviently to the fiscal authorities; fiscal dominance has been the prevailing regime in Italy since political unification. The nature of the institutional structure linking deficits to monetary base creation has changed over time. In the early days, the profit-seeking banks of issues were constrained by the convertibility clause and by a legal ceiling on their outstanding currency. Yet, these banks over-issued from time to time. In our study of competitive central banking (Fратиanni and Spinelli, 1985, pp. 494-95) we concluded that:

The high probability, if not certainty, that government would legalize the excessive circulation, while maintaining the prices of bank notes unchanged, raised the expected profits of the over-issuing bank. Had the latter faced a sharp drop in the price of the notes, its supply behavior would have been different. The weak link in the system was the government which maintained fixed relative prices among notes without actually controlling the aggregate amount of total currency in circulation. This weakness, in turn, had more of a political than an intellectual root: government borrowings were often the reason for breaking through the note ceiling.

Larger budget deficits were the reason why Italy got off the gold standard twice in the 19th century. Budgetary improvements, on the other hand, were often if not always accompanied by lower money growth and the return to either the gold standard or stable exchange rates. For example, on May 1, 1866 --six months after having signed the Latin Monetary Union agreement-- Italy declared the inconvertibility of paper money into metal. The reason was a sharp deterioration in the public finances. Budget deficits were also responsible for the monetary explosions of 1866-67 and 1870-7, the second inconvertibility in the middle of the 1880s, and the policy reversal of the lira forte (the strong lira) in the second half of the 1930s.⁶ Fiscal discipline, on the other hand, made possible the return to currency convertibility of 1880; the steady and non-inflationary monetary policy from 1897 to 1913 and the 1950s; and the stabilization policy of the 1920s and the lira forte of the 1930s.

The influence of public finances on monetary policy became even stronger in modern

⁶ We exclude the two world wars because we consider them a legitimate example of monetary financing.

times. Fiscal dominance became more institutionalized as the BI lost degrees of independence in the mid 1930s and the Fascist government asserted its right to have unconditional recourse to central bank financing. This dependence of the Italian central bank persisted in the post-WWII period. Fiscal dominance reached extreme forms in the 1970s, under the pressure of rising budget deficits. The Governorship of Paolo Baffi in the mid 1970s set the intellectual premises for an independent BI. The pendulum began to swing the other way in 1981, with the 'divorce' decree. But the big structural break was the Maastricht Treaty that forced the Italian government to cut drastically budget deficits, while giving independence to the central bank. Fiscal dominance was still working, this time in a virtuous circle.

One way to interpret theoretically the results of fiscal dominance is to place the central bank and the Treasury within a setting of strategic conflict (Tabellini 1988). The central bank tends to interpret the desires of the public as wanting price stability or low inflation rates. The fiscal authorities, instead, interpret the public as wanting public expenditures. This difference in motives makes the Treasury seek as much seigniorage as possible from the monetary authorities. The greater the power of the fiscal authorities over the monetary authorities, that is the greater the degree of fiscal dominance, the lower the cost to Treasury of financing a given budget deficit. According to this view, central bank independence and monetary accommodation are inversely related. Hence, central banks with a high degree of independence generate lower rates of inflation than dependent central banks (Alesina and Summers 1993; Fratianni and Huang 1992). Stated in a slightly different language, regimes of monetary dominance are associated with relatively low inflation, whereas regimes of fiscal dominance are associated with relatively high inflation.

APPENDIXList of variables used in the empirical work and sources

Sample period = 1861-1997, annual frequency

F&S = Fratianni and Spinelli

S&F = Spinelli and Fratianni

M = money stock (F&S 1997, pp. 49-52; BI Annual Reports, various)

DLM = the growth rate of M

MB = total monetary base (F&S 1997, pp. 49-52; BI Annual Reports, various)

MBTR = Treasury component of MB (F&S 1997, pp. 49-52; BI Annual Reports, various)

$\Delta mbtr = (MBTR_t - MBTR_{t-1}) / Y_{t-1}$

BMOT = domestic component of MB, other than Treasury (F&S 1997, pp. 49-52; BI Annual Reports, various)

BF = foreign component of MB (F&S 1997, pp. 49-52; BI Annual Reports, various)

BP = monetary base held by the public (F&S 1997, pp. 49-52; BI Annual Reports, various)

BR = required reserves (F&S 1997, pp. 49-52; BI Annual Reports, various)

BE = excess reserves (F&S 1997, pp. 49-52; BI Annual Reports, various)

S = government interest-bearing debt (F&S 1997, p. 11; BI Annual Reports, various)

DEF = government budget deficit (F&S 1997, p. 11; BI Annual Reports, various)

Y = net national income (F&S 1997, p. 12; BI Annual Reports, various)

def = DEF/Y_t

War years = 1866 (third war of independence against Austria), 1911-12 (Libyan war), 1915 through 1918 (World War I), 1935-36 (Ethiopian war), and 1940 through 1945 (World War II).

Fixed exchange rate years: 1862-1865 (gold standard), 1884-1891 (gold standard), 1904-1914 (gold standard), 1928-1934 (resumption of gold standard), 1951-1970 (Bretton Woods), 1979-1991 (EMS), 1997-1998 (EMS).

Business cycle expansion and contraction phases: De Mattia (1978, pp. 1071-1072 and ISCO).

Expansion phases	Contraction phases
1861-1866	1867-1872
1873-1875	1876-1881
1882-1886	1887-1889
1890-1891	1892-1893
1894-1907	1908-1910
1911-1913	1914-1919
1920-1925	1926-1927
1928-1929	1930-1931
1932	1933-1934
1935-1939	
1945-1947	1948

1949-1951	1952
1953-1957	1958
1959-1963	1964
1965-1970	1971
1972-1974	1975
1976	1977
1978-1980	1981-1983
1984-1992	1993
1994-1995	1996
1997-1998	

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